

THE PRODUCTS OF THE BLACKSMITH IN MID-LATE ANGLO-SAXON ENGLAND

By Patrick Ottaway

www.pjoarchaeology.co.uk

Part 4

Notes for Parts 1-3

1. For the purposes of this paper the following period sub-divisions have been adopted: Early Anglo-Saxon c. 400 - 650; Middle Anglo-Saxon c. 650 - 850; Late Anglo-Saxon c. 850 - 1066. At York the Middle Anglo-Saxon period is usually referred to as Anglian and the Late Anglo-Saxon period as Anglo-Scandinavian, but for the sake of brevity these terms have not been used here unless reference is specifically to York material.

2. *Aelfric's Colloquy*, trans. M. Swanton, *Anglo-Saxon Prose*, revised edn (London, 1985), pp. 107-15 at p.113.

3. See below notes 4 and 5.

4. Publication details of the principal Middle Anglo-Saxon sites are as follows. Flixborough: P. Ottaway, various contributions in D. H. Evans and C. P. Loveluck eds, *Life and Economy at Early Medieval Flixborough c. AD 600 – 1000: The Artefact Evidence, Excavations at Flixborough 2* (Oxford, 2009). Hamwic: the ironwork is largely unpublished, but see P. V. Addyman and D. Hill, Saxon Southampton: a review of the evidence. Part 2: industry, trade and everyday life, *Proc. Hampshire Field Club Archaeol. Soc.* **26** (1969), pp. 61-96, at pp. 65-6; P. Andrews, Iron objects, in M. F. Garner, Middle Saxon evidence at Cook Street, Southampton (SOU254), *Proc. Hampshire Field Club Archaeol. Soc.* **49** (1993), pp. 109-10; references to unpublished objects employ the site code followed by the small find number in the form SOU00.00. Thwing (Paddock Hill), East Riding of Yorkshire: the iron objects are unpublished, but there is a manuscript report by P. Ottaway - numbers used below take the form I000. York, Fishergate: N. S. H. Rogers, *Anglian and Other Finds from Fishergate*, *Archaeol. York* **17/9** (London, 1993).

5. Publication details of the principal late Anglo-Saxon sites are as follows. Goltho: I. H. Goodall, Objects of iron, in G. Beresford, *Goltho: the Development of an Early English Manor c.850-1150*, English Heritage Archaeol. Report **4** (London, 1987), pp. 177-87. Repton: the ironwork is largely unpublished (excavations by M. Biddle and B. Kjølbye-Biddle). Thetford: I. H. Goodall, Iron objects, in A. Rogerson and C. Dallas, *Excavations in Thetford 1948-59 and 1973-80*, East Anglian Archaeol. **22** (Gressenhall, 1984), pp. 76-106; I. H. Goodall and P. Ottaway, Iron objects, in C. Dallas, *Excavations in Thetford by B.K.Davison between 1964 and 1970*, East Anglian Archaeol. **62** (Gressenhall, 1993), pp. 96-116. Winchester: ironwork from sites within the city walls is published under various headings by I. H. Goodall in M. Biddle, *Object and Economy in Medieval Winchester*, 2 vols. Winchester Studies **7.2** (Oxford, 1990). Objects from the suburbs appear in H. Rees, N. Crummy, P.J. Ottaway and G. Dunn, *Artefacts and Society in Roman and Medieval Winchester:*

Small Finds from the Suburbs and Defences 1971-86 (Winchester, 2008). York: D. M. Waterman, Late Saxon, Viking and early medieval finds from York, *Archaeologia* **97** (1959), pp. 59-105; A. MacGregor, *Anglo-Scandinavian Finds from Lloyds Bank, Pavement and Other Sites*, *Archaeol. York* **17/3** (London, 1982); P. Ottaway, *Anglo-Scandinavian Ironwork from Coppergate*, *Archaeol. York* **17/6** (London, 1992); P. Ottaway and N. Rogers, *Craft Industry and Everyday Life: Finds from Medieval York*, *Archaeol. York* **17/15** (York, 2002), pp. 3005-12.

6. See, for example, S. O'Connor, Conservation of the Coppergate ironwork, in Ottaway, *Ironwork from Coppergate*, pp. 466-71.

7. See in particular: R. F. Tylecote and B. J. J. Gilmour, *The Metallography of Ferrous Edge Tools and Edged Weapons*, *Brit. Archaeol. Rep. Brit. Ser.* **155** (Oxford, 1986); and J. G. McDonnell, Metallography data, in Ottaway, *Ironwork from Coppergate*, microfiche p. 3:B12-14.

8. For further details on the types of iron ore to be found in Britain and their properties, R. F. Tylecote, *The Prehistory of Metallurgy in the British Isles* (London, 1986), pp. 124-8.

9. R. F. Tylecote, L. Biek and J. W. Haldane, Iron smelting residues, in C. Mahany, A. Burchard and G. Simpson, *Excavations at Stamford, Lincs. 1963-9*, *Soc. Med. Archaeol. Monogr. Ser.* **9** (London, 1982), pp. 135-44.

10. J. Bayley, Metalworking evidence, in Dallas and Rogerson, *Excavations in Thetford*, p. 107.

11. For details of the smelting process, Tylecote, *Prehistory of Metallurgy*, pp. 128-46.

12. C. F. Tebbutt, A Middle-Saxon iron smelting Site at Millbrook, Ashdown Forest, Sussex, *Sussex Archaeol. Collections* **120** (1982), 19-35.

13. J. Haslam, A Middle Saxon iron smelting site at Ramsbury, Wilts., *Medieval Archaeol.* **24** (1980), 1-64.

14. A. Burchard, A Saxo-Norman iron smelting site at Co-op in High Street, in Mahany, Burchard and Simpson, *Excavations at Stamford*, pp. 105-15; R. F. Tylecote, Recent work on early ironworking sites in the Stamford area, *Bull. of the Hist. Metallurgy Group* **4, 1** (1970), pp. 24-7; Tylecote, *Prehistory of Metallurgy*, p. 183.

15. R. F. Tylecote, A bloomery site at West Runton, *Norfolk Archaeol.* **34** (1967), 187-214.

16. Tylecote, *Prehistory of Metallurgy*, p. 145.

17. For the methodology of pattern-welding, J. W. Anstee and L. Biek, A study in pattern-welding, *Medieval Archaeol.* **5** (1961), pp. 71-93; Tylecote, *Prehistory of Metallurgy*, pp. 171-2.

18. Tylecote, *Prehistory of Metallurgy*, p. 146.

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19. V. I. Evison, Early inlaid Anglo-Saxon metalwork, *Antiq. J.* **35** (1955), pp. 30-45; for Late Anglo-Saxon examples from Winchester, section entitled: Inlaid iron objects, in Biddle, *Object and Economy*, pp. 160-3 (contributions by D. A. Hinton, M. Cowell and S. Keene).

20. Tylecote, *Prehistory of Metallurgy*, pp. 198-9.

21. The methodology of tinning is described by Theophilus in *On Divers Arts*, trans. J. G. Hawthorne and C. S. Smith (New York, 1979), p. 187. See also A. Oldeberg, *Metallteknik under Vikingatid och Medeltid* (Stockholm, 1966), p. 275; and P. Wilthew and P. Ottaway, Non-ferrous plating, in Ottaway, *Ironwork from Coppergate*, pp. 486-90.

22. Oldeberg, *Metallteknik under Vikingatid och Medeltid*; D. M. Wilson, Craft and industry, in *The Archaeology of Anglo-Saxon England* ed. D. M. Wilson (London, 1976), pp. 253-82 at p. 266.

23. J. G. McDonnell and P. Ottaway, Chronological and spatial distribution of slag, in Ottaway, *Ironwork from Coppergate*, pp. 476-80.

24. For example, P. Hallinder and K. Haglund, Iron currency bars in Sweden, *Excavations at Helgö*, **5.1**, *Workshop Part 2*, eds K. Lamm and A. Lundström (Stockholm, 1978), pp. 30-58.

25. Goodall, *Excavations in Thetford*, pp. 76-7, no. 1; G. Arwidsson and G. G. Berg, *The Mästermyr Find: A Viking Age Tool Chest from Götland* (Stockholm, 1983), p. 17, nos 110-1; Hallinder and Haglund, *Excavations at Helgö*, **5.1**, pp. 45-6.

26. Ottaway, *Ironwork from Coppergate*, pp. 492-510.

27. See below, Part 4, pp. 7-8.

28. McDonnell in Ottaway, *Ironwork from Coppergate*, pp. 511-12 and microfiche p. 3:C2.

29. E. J. E. Pirie, *Post-Roman Coins from York Excavations 1971-81*, *Archaeol. York* **18/1** (London, 1986), pp. 33-7; Ottaway, *Ironwork from Coppergate*, p. 525.

30. S. Pay, *Hamwic: Southampton's Saxon Town* (Southampton, 1987), pp. 10-11; S. M. Youngs and J. Clark, Medieval Britain in 1980, *Medieval Archaeol.* **25**, pp. 166-228, at p. 168.

31. Haslam, *Ramsbury*.

32. D. Perring, *Early Medieval Occupation at Flaxengate, Lincoln*, *Archaeol. Lincoln* **9/1** (London, 1981).

33. Ottaway, *Ironwork from Coppergate*, esp. pp. 478-80 and 492-510.

34. For Halton, R. G. Collingwood, *Northumbrian Crosses of the pre-Norman Age* (London, 1927), pp. 159-62, fig. 191.

35. London, British Library, Cotton Claudius B. IV, fol. 10; C.R. Dodwell, *Anglo-Saxon Art* (Manchester, 1982), pl. 13.

36. Archaeological evidence: L. L. Ketteringham, *Alsted: Excavation of a Thirteenth - Fourteenth Century Sub-manor House with its Ironworks in Netherne Wood, Merstham, Surrey*, Surrey Archaeol. Soc. Research Vol. **2**, pp. 25-31; P. J. Huggins and R. M. Huggins, Excavation of monastic forge and Saxo-Norman enclosure, Waltham Abbey, Essex 1972-3, *Essex Archaeol. and Hist.* **5**, 127-84. For illustrative evidence see, for example, London, British Library, Sloane 3983, fol. 5r; Tylecote, *Prehistory of Metallurgy*, p. 190, fig. 131.
37. Haslam, *Ramsbury*, pp. 17-8.
38. Caedmon manuscript: Oxford, Bodleian Library, Junius II, p. 54; T. H. Ohlgren, *Anglo-Saxon Textual Illustration*, Medieval Institute Publications, West Michigan University (Kalamazoo, 1992), pl. 16.28.
39. D. A. Hinton, *A Smith in Lindsey: The Anglo-Saxon Grave at Tattershall Thorpe, Lincolnshire*, Soc. Medieval Archaeol. Monogr. Ser. **16** (2000), pp. 23 -24, figs 14-15, no. 4. An earlier article on Tattershall Thorpe was published by D. Hinton as A smith's hoard from Tattershall Thorpe, Lincolnshire: a synopsis, *Anglo-Saxon England* **22** (1993), 147-66.
40. Ottaway, *Ironwork from Coppergate*, pp. 512-13, no. 2200.
41. For a comprehensive survey, M. Müller-Wille, Die frühmittelalterliche Schmied im Spiegel skandinavischer Grabfunde, *Frühmittelalterliche Studien* **11** (1977), 127-201.
42. Hand hammer defined by Arwidsson and Berg, *Mästermyr Find*, p. 30. Examples from: Goltho, Goodall, *Goltho*, pp. 177-8, no. 1; Tattershall Thorpe, Hinton, *A Smith in Lindsey*, pp. 20-22, figs 11-13, no. 1; Thetford, Goodall, *Excavations in Thetford*, pp. 76-7, no. 4; York, Ottaway, *Ironwork from Coppergate*, p. 514, no. 2201.
43. Ottaway, *Ironwork from Coppergate*, p. 516, nos 2204 and 2224.
44. Goodall, *Excavations in Thetford*, p. 77, no. 8.
45. For tongs from Old London Bridge, R. E. M. Wheeler, *London and the Vikings*, London Museum Catalogues **6** (London, 1927), p. 22. The tongs are also illustrated, along with the second pair from London, in F. Pritchard, Small finds, *Aspects of Saxo-Norman London: 2, Finds and Environmental Evidence*, ed. A. Vince, London and Middlesex Archaeol. Soc., Special Pap. **12** (1991), 120-278, at p. 135 (second pair is no. 21).
46. Tongs from: Flixborough, Ottaway, *Life and Economy*, pp. 317-8, no. 3063; Ramsbury, V. I. Evison, Objects of bronze and iron, in Haslam, *Ramsbury*, pp. 33-41 at pp. 36-7, nos. 7-8; Repton, sfno. 3721; Tattershall Thorpe, Hinton, *A Smith in Lindsey*, pp. 24-6, figs 15-16, no. 5. Note also early Anglo-Saxon pairs from: Shakenoak Farm, P. D. C. Brown, The ironwork, in A. C. C. Brodrigg, A. R. Hands and D. R. Walker, *Excavations at Shakenoak Farm near Wilcote, Oxfordshire: Part 3, Site F* (Oxford, 1972), pp. 86-117, fig. 42, no. 192 (length 190mm); Sibertswold (Kent), B. Faussett, *Inventorium Sepulchrae*, (London, 1856), grave 115 (length c.230mm).

47. Small hammers from: Tattershall Thorpe, Hinton, *A Smith in Lindsey*, pp. 20-22, figs 11-13, nos 2-3; York, Ottaway, *Ironwork from Coppergate*, pp. 514-15, nos. 2202-3.
48. Punches from: Crayke, T. Sheppard, Viking and other relics at Crayke, Yorkshire, *Yorkshire Archaeol. J.* **34** (1939), pp. 273-81, at p. 280, nos 20-5; Hamwic, SOU169.1876; Tattershall Thorpe, Hinton, *A Smith in Lindsey*, 31-4, figs 20-2, nos 9-13; York, Ottaway, *Ironwork from Coppergate*, pp. 516-17, nos. 2205-23 and 2225-6.
49. Coin dies from York, see above, note 29; Lincoln, M. Blackburn and J. Mann, A Late Saxon coin die from Flaxengate, *Lincoln Archaeology 1994-5: 7th Annual Report of the City of Lincoln Archaeological Unit*, ed. M. J. Jones (Lincoln, 1995), pp. 27-9; London, Thames Exchange site, M. D. O'Hara, An iron reverse die of the reign of Cnut, *The Reign of Cnut*, ed. A. R. Rumble (Leicester, 1994), pp. 231-71.
50. McDonnell in Ottaway, *Ironwork from Coppergate*, pp. 525-7 and microfiche p. 3:C11-13
51. Chisels from: Crayke, N. Yorks., Sheppard, Viking and other relics, p. 280, no. 26; Thetford, Goodall, *Excavations in Thetford*, pp. 76-7, nos. 5-7; Goodall and Ottaway, *Excavations in Thetford*, pp. 99-100, no. 5; York (Anglian), Rogers, *Fishergate*, p. 1242, nos. 4938-9; (Anglo-Scandinavian), Ottaway, *Ironwork from Coppergate*, pp. 521-2, no. 2245.
52. Goodall, *Excavations in Thetford*, p. 77, no. 10.
53. I. H. Goodall, The ironwork, in P. Armstrong, D. Tomlinson and D. H. Evans, *Excavations at Lurk Lane Beverley, 1979-82*, Sheffield Excavation Reports **1** (Sheffield, 1991), pp. 132-46 at p. 135, no. 298.
54. Files from York, Ottaway, *Ironwork from Coppergate*, pp. 521-3, nos. 2246-7; and Tattershall Thorpe, Hinton, *A Smith in Lindsey*, p. 34, figs 22-4, nos 14-16.
55. McDonnell in Ottaway, *Ironwork from Coppergate*, p. 523 and microfiche p. 2:B7-10.
56. Tattershall Thorpe, Hinton, *A Smith in Lindsey*, p. 26, figs 18 and 20, no. 7; Ottaway, *Ironwork from Coppergate*, pp. 523-4, no. 2249.
57. Hinton, *A Smith in Lindsey*: draw-plate, pp. 26 -31, figs 19-20, no. 8; soldering lamp, pp. 37-41, figs 25 and 27, no. 24.
58. Ottaway, *Ironwork from Coppergate*, pp. 523-5, nos. 2251-2.
59. Ottaway, *Ironwork from Coppergate*, pp. 523-4, no. 2250.
60. Swanton, *Anglo-Saxon Prose*, pp. 25-7.
61. For a general survey of woodworking techniques and tools in Anglo-Saxon England, D. M. Wilson, Anglo-Saxon carpenter's tools, *Studien zur Europäischen Vor und Frühgeschichte*, ed. M. Claus, W. Haarnagel and K. Raddatz (Neumünster, 1968), pp. 143-50; Wilson, Craft and industry, pp. 253-9. For the use of carpenter's tools, see also W. L. Goodman, *The History of Woodworking Tools* (London, 1964);

R. A. Salaman, *Dictionary of Tools used in the Woodworking and Allied Trades, c.1700-1970* (London, 1975); G. Milne, *Timber Building Techniques c.900-1400*, London and Middlesex Archaeol. Soc., Special Pap. **15** (1992).

62. K. Leahy, The Flixborough Hoard, *Current Archaeol.* **141** (1995), 352; Ottaway, *Life and Economy*, pp. 256-67.

63. Stratified axes from: Flixborough, Ottaway, *Life and Economy*, p. 253, fig. 7.1, no. 2423; Repton, sfno. 3296; York, Ottaway, *Ironwork from Coppergate*, p. 527, no. 2253. Unstratified axes from Britain are to be found in: A. Bjørn and H. Shetelig, *Viking Antiquities in England*, *Viking Antiquities in Great Britain and Ireland* **4**, ed. H. Shetelig (Oslo, 1940). Waterman, Late Saxon, Viking and early medieval finds, fig. 10, nos 5-6 and 8; Wheeler, *London and the Vikings*, pp. 22-6.

64. Wheeler, *London and the Vikings*, see also Goodman, *History of Woodworking Tools*, pp. 27-31; and B. Ward-Perkins, *London Museum Medieval Catalogue* (London, 1940), pp. 55-65.

65. Wheeler, *London and the Vikings*, pp. 22-4 (types III and V).

66. Wilson, *Craft and industry*, p. 257.

67. See an early eleventh century hymnal: London, British Library, Cotton Julius A. VI, fol. 5v (June; chopping down trees); E. Temple, *Anglo-Saxon Manuscripts 900-1066*, A Survey of Manuscripts Illuminated in the British Isles **2** (London, 1976), p. 80 and illustration 199. *The Bayeux Tapestry*, ed. F. Stenton (London, 1957), fig. 38 (boatmaking) and fig. 65 (fighting).

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69. Stratified T-shaped axes from: Hamwic, SOU24.22; London, Pritchard, Small finds, p. 135, no. 26; St Neots, P. V. Addyman, Late Saxon settlements in the St Neots Area 3: The village or township at St Neots, *Proc. Cambridgeshire Ant. Soc.* **64** (1973), pp. 45-99, at p. 94, no. 29; Winchester, Goodall, *Object and Economy*, pp. 273-4, no. 391. T-shaped axes from hoards at: Crayke, Sheppard, Viking and other relics, p. 280, no. 17; Flixborough, Ottaway, *Life and Economy*, pp. 257, figs 7.6-7, nos 2453-6; Hurbuck, C. C. Hodges, Anglo-Saxon remains, *Victoria County History of Durham*, ed. W. Page, 2 vols. (London, 1905) **1**, pp. 211-40, at pp. 213-15. Unstratified T-shaped axes from: London, Wheeler, *London and the Vikings*, pp. 25-6, fig. 8, nos 4-6; York, Waterman, Late Saxon, Viking and early medieval finds, fig. 5, no. 7.

70. Abraham building an altar, Oxford, Bodleian Library, Junius 11, p.87; Ohlgren, *Textual Illustration*, pl. 16.49; *Bayeux Tapestry*, ed. Stenton, fig. 38; Goodman, *History of Woodworking Tools*, pp. 29-31.

71. J. Ypey, Wapen of Werktuig?, *Rijksdienst Voor Het Oudheidkundig Bodermonderzoek, Overdrukken* **166** (Amersfoort, 1981).

72. C. Fox, *The Archaeology of the Cambridge Region* (Cambridge, 1923), pl. 36; Wilson, *Craft and industry*, pp. 256-7.

73. Adzes from: Flixborough (excavation), Ottaway, *Life and Economy*, p. 253, fig. 7.1, no. 2425, (hoard), fig. 7.7, nos 2458-9 (2459 T-shaped); Hurbuck, Hodges, Anglo-Saxon remains (two, of which one T-shaped); Thetford, Goodall, *Excavations in Thetford*, pp. 78-9, nos 11-2; Skerne, East Riding of Yorkshire, C. Loveluck, Finds, in J. Dent, C. Loveluck and W. Fletcher, The early medieval site at Skerne, in eds R. Van de Noort and S. Ellis, *Wetland Heritage of the Hull Valley*, pp. 227-36 at pp. 230-1, fig. 11.8.

74. Socketed chisels from: Flixborough, Ottaway, *Life and Economy*, p. 254, no. 2426; Skerne, Loveluck, Finds, p. 231, fig. 11.8; York, Ottaway, *Ironwork from Coppergate*, pp. 529-30, no. 2258. For mode of use and form of handle, Goodman, *History of Woodworking Tools*, pp. 31-2; S. McGrail, Axe, adze, hoe or slice, *Nautical Archaeol.* **6** (1977), pp. 62-4.

75. Wedges from Thwing, nos 16-8, and York, Ottaway, *Ironwork from Coppergate*, pp. 529-30, no. 2257.

76. Pritchard, Small finds, p. 135, no. 26.

77. McDonnell in Ottaway, *Ironwork from Coppergate*, p. 530, microfiche p. 3:C14.

78. Goodall, *Goltho*, pp. 177-8, nos 5-6.

79. *Bayeux Tapestry*, ed. Stenton, fig. 38; the 'breast auger' is discussed by Goodman, *History of Woodworking Tools*, pp. 172-3.

80. Flixborough hoard: Ottaway, *Life and Economy*, p. 258, fig. 7.9, nos 2462-4; Mästermyr: Arwidsson and Berg, *The Mästermyr Find*, p. 13, nos 46-51. Stratified spoon augers from: Skerne, Loveluck, Finds, pp. 231-2, fig. 11.8; Thetford, Goodall, *Excavations in Thetford*, pp. 77-8, nos 14-7; York (Anglian), Rogers, *Fishergate*, pp. 1243-5, nos 4942 and 4944; (Anglo-Scandinavian), Ottaway, *Ironwork from Coppergate*, pp. 532-6, nos 2260-8. Spoon augers in hoards at: Hurbuck, Hodges, Anglo-Saxon remains; Westley Waterless, Wilson, Anglo-Saxon carpenter's tools, pp. 146-7; and Wilson, *Craft and industry*, p. 258.

81. Shaves from: Flixborough (hoard), Ottaway, *Life and Economy*, p. 258, fig. 7.8, 2460-1; York, Ottaway, *Ironwork from Coppergate*, pp. 531-2, no. 2259.

82. Ramsbury, Evison, *Ramsbury*, p. 37, no. 17; Sandtun, Wilson, Anglo-Saxon carpenter's tools, p. 148.

83. Early Anglo-Saxon example from Sutton Courtenay, E. T. Leeds, A Saxon village at Sutton Courtenay, Berkshire, *Archaeologia* **73** (1923), pp. 147-92, pl. 27, L. Middle Anglo-Saxon examples from: Butley, V. Fenwick, Insula de Burgh, excavations at Burrow Hill, Butley, Suffolk, 1978-81, *Anglo-Saxon Stud. Archaeol. Hist.* **3** (1984), pp. 35-54, at p. 40, fig. 4; Riby, P. Ottaway, Ironwork, in K. Steedman, Excavation of a Saxon site at Riby Crossroads, Lincolnshire, *Archaeol. J.* **151** (1994), pp. 212-306, at pp. 249-63, no. 22; and Thwing, nos 173-5. Late Anglo-Saxon examples from: Repton, sfnos 3331 and 5708, and York, Ottaway, *Ironwork from Coppergate*, p. 589, no. 2982.

84. See Part 1, p. 6.

85. Brandon, unpublished, excavated by Suffolk Archaeological Unit, sfno. 9904; Hamwic, Addyman and Hill, Saxon Southampton, pp. 64-5, no. 12 (length 160mm).

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For use, C. Morris, Aspects of Anglo-Saxon and Anglo-Scandinavian lathe-turning, *Woodworking Techniques before A.D.1500*, ed. S. McGrail, Brit. Archaeol. Rep. Int. Ser. **129** (Oxford, 1982), pp. 245-62, at pp. 254-6.

86. Crayke, Sheppard, Viking and other relics, p. 280; York, Ottaway, *Ironwork from Coppergate*, pp. 536-7, nos 2269-70.

87. Rasps from Flixborough, Ottaway, *Life and Economy*, p. 255, fig. 7.1, nos 2427-9; York, Ottaway, *Ironwork from Coppergate*, p. 522, no. 2248.

88. G. C. Dunning, The Anglo-Saxon plane from Sarre, *Archaeologia Cantiana* **63** (1959), pp. 196-7. For a discussion, including reference to other European examples, see Goodman, *History of Woodworking Tools*, pp. 54-6.

89. Goodall, *Excavations in Thetford*, p. 79, no. 18.

90. Goodall, *Object and Economy*, pp. 299-300, no. 412.

91. Salaman, *Dictionary of Tools*, p. 273. Probable millpicks from Goltho, Goodall, *Goltho*, p. 181, no. 33; Winchester, Goodall, *Object and Economy*, pp. 299-302, nos 416-7; York, Ottaway, *Ironwork from Coppergate*, nos 2232 and 2237 (described as 'tanged punches').

92. Slickers from: Beverley, Goodall, *Lurk Lane*, p. 135, no. 319; Hamwic, SOU169.2572; Winchester, Goodall, *Object and Economy*, pp. 248-9, nos 324-5 and Rees et al. *Artefacts and Society*, pp. 308-9, fig. 174, no. 2216.

93. Ottaway, *Life and Economy*, p. 278, fig. 8.1, no. 2475.

94. For Thetford, Goodall, *Excavations in Thetford*, p. 81, nos 41-2 (single armed); and York, Ottaway, *Ironwork from Coppergate*, pp. 554-5, nos 2744-7 (double-armed).

95. For use of the creaser, see W. A. Attwater, *Leathercraft* (London, 1961), p. 25; R. A. Salaman, *Dictionary of Leatherworking Tools c.1700-1950 and the Tools of Allied Trades* (London, 1986).

96. For the use of the leatherworker's awl, see Attwater, *Leathercraft*, p. 28. Awls with arms of diamond-shaped cross-section include a Middle Anglo-Saxon example from Cottam, East Riding of Yorkshire, P. Ottaway, Iron objects, in J. D. Richards, Cottam: an Anglian and Anglo-Scandinavian settlement on the Yorkshire Wolds, *Archaeol. J.* **156**, pp. 72-8 at p. 75, illus. 49, no. 18. Late Anglo-Saxon examples from: Thetford, Goodall and Ottaway, *Excavations in Thetford*, pp. 102-3, nos. 47-9; Winchester, Goodall, *Object and Economy*, pp. 248-9, no. 326; York, MacGregor, *Anglo-Scandinavian Finds*, pp. 80-1, nos 424-6, and Ottaway, *Ironwork from Coppergate*, pp. 552-4. Awls with arms of other cross-section forms are numerous, but see, for example, those from Thetford, Goodall, *Excavations in Thetford*, p. 81, nos. 34-40b.

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111. Tweezers from Thwing, nos I21-2, and York, Ottaway, *Ironwork from Coppergate*, pp. 550-1, nos 2701-4.

112. Ottaway, *Ironwork from Coppergate*, pp. 542-7.

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176. Corner brackets of various forms from: Thwing, I169-99; Hereford, Shoesmith, *Castle Green*, pp. 36-8, fig. 32; Thetford, Goodall, *Excavations in Thetford*, p. 89, nos. 154-5; York, Ottaway, *Ironwork from Coppergate*, pp. 642-3, nos 3487-8.

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178. Small fittings from Thetford, Goodall, *Excavations in Thetford*, p. 89, nos 160-1, and York, Ottaway, *Ironwork from Coppergate*, p. 629, nos 3365 and 3367, and (discs) pp. 623-4, nos 3408-9.

179. Ottaway, *Ironwork from Coppergate*, pp. 631 and 641, nos 3322-3, 3475 and 3478.

180. Vessel suspension fittings from York: Ottaway, *Ironwork from Coppergate*, pp. 650-1, nos 3544-5 (U-eyed form), nos 3547-52 (flat plate form).

181. Vessel handles from: North Elmham, Goodall, *North Elmham Park*, p. 514, no. 90; Portchester Castle, Hinton and Welch, *Portchester 2*, pp. 200-1, nos 16-7; York, Ottaway, *Ironwork from Coppergate*, pp. 646-7, nos 3501-2 and 3505.

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823, no. 2579; York, Ottaway, *Ironwork from Coppergate*, pp. 652-3, nos 3561-2 and 3565.

184. Wall hooks from: Thetford, Goodall, *Excavations in Thetford*, pp. 88-9, nos 134-5; Winchester, Goodall, pp. 328, 476-81; York, Ottaway, *Ironwork from Coppergate*, p. 651, nos 3553-4 and 3557-9.

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186. Socketed candleholders from North Elmham, Goodall, *North Elmham Park*, p. 514, nos 92-3, and York, Ottaway, *Ironwork from Coppergate*, pp. 679-80. Prickets: *ibid.*, nos 3675 3677-8 and 3680.

187. W. H. Manning, *Catalogue of the Romano-British Iron Tools, Fittings and Weapons in the British Museum* (London, 1985), p. 95, pl. 42, O66.

188. Examples from Dover, Evison, *Dover*, pp. 100-1, figs 17, 21, 30, 33-4, 39 and 51, and Chamberlain's Barn, Beds., M. Hyslop, *Two Anglo-Saxon Cemeteries at Chamberlain's Barn*, Leighton Buzzard, *Bedfordshire Archaeol. J.* **120** (1963), pp. 161-200, at p. 196. Thwing has produced nineteen bolts (I283-302) and eight keys (I304-11) and Ripon two complete locks, Ottaway, *The ironwork*, pp. 106-9, fig. 22, nos 233 and 367. Keys are numerous and include examples from York (Anglian), Rogers, *Fishergate*, p. 1423, nos 5234-5, and as part of chatelaine, pp. 1425-8, nos 5243-5, and (Anglo-Scandinavian), Ottaway, *Ironwork from Coppergate*, pp. 674-5, nos 3655-60.

189. Goodall, *Object and Economy*, pp. 1016-17, no. 3686. For mode of operation, see also Ottaway, *Ironwork from Coppergate*, fig. 288.

190. Examples with pear-shaped bows from: Cheddar, Goodall, *Cheddar*, pp. 263-4, nos 4, 15 and 96; Portchester Castle, Hinton and Welch, *Portchester 2*, p. 197, no. 12; Winchester, Goodall, *Object and Economy*, pp. 1006-7, nos 3731-2; see also Ward-Perkins, *London Museum Medieval Catalogue*, pp. 134-6 (type 1). Examples with stem widening to a looped terminal from Hamwic, SOU169.984, and York, Ottaway, *Ironwork from Coppergate*, p. 673, no. 3654.

191. Pontefract, T. Wilmott, *The Anglo-Saxon church and cemetery on The Booths*, in I. Roberts and T. Wilmott, *Pontefract, 1: the Growth and Topography of the Medieval Town*, Yorkshire Archaeol. Monogr. (Wakefield, in prep.), in grave 588; Ripon, Ottaway, *The ironwork*, pp. 109-10, fig. 25, nos 267 and 567. Late Anglo-Saxon example from Beverley, Goodall, *Lurk Lane*, p. 134, no. 503. See also wooden lock case with bolt, tumbler and spindle from York, MacGregor, *Lloyds Bank*, pp. 80-1, no. 430.

192. Middle Anglo-Saxon examples from Hamwic, Addyman and Hill, *Saxon Southampton*, pp. 65-6, nos 14-5, and SOU169.2809, SOU99.15, SOU99.43. Late Anglo-Saxon examples from Thetford, Goodall, *Excavations in Thetford*, p. 95, nos 184-91, and York, Ottaway, *Ironwork from Coppergate*, pp. 668-71.

193. Examples from York, Ottaway, *Ironwork from Coppergate*, nos 3637, 3641 and 3653.

194. Three examples from pagan graves in Kent, Faussett, *Inventorium Sepulchrae*, pl. 10, nos 8-10. Another from the cemetery at Castledykes, N. Lincs. (excavated by Humberside Archaeological Unit), grave 1, find no. 1. Late Anglo-Saxon examples from: York, Ottaway, *Ironwork from Coppergate*, pp. 665-7, no. 3610; Northampton, I. H. Goodall, B. Ellis and G.E. Oakley, The iron objects, in J. H. Williams, *St Peter's Street, Northampton, Excavations 1973-6* (Northampton, 1979), pp. 268-77, at pp. 268-9, no. 3; Lincoln, R. White, An iron barrel padlock, *Lincoln Archaeological Trust 8th Annual Report 1979-80*, ed. M. Jones, pp. 23-5.

195. Padlock keys from Winchester, Goodall, *Object and Economy*, pp. 1005-7, nos 3693-7, and York, Ottaway, *Ironwork from Coppergate*, pp. 675-6, nos 3662-5 and 3668-70.

196. Probable pre-Conquest examples from Goltho, Goodall, *Goltho*, p. 183, nos 101-2. Keys from: *Goltho*, *ibid.*, no. 111, and York, Ottaway, *Ironwork from Coppergate*, no. 3666.

197. Examples from: Northampton, Goodall, *St Peter's Street*, pp. 268-9, no. 1; Thetford, Goodall, *Excavations in Thetford*, p. 89, no. 169; York, K. M. Richardson, Excavations in Hungate, York, *Archaeol. J.* **116** (1959), pp. 51-114, at pp. 81-3, fig. 18, no. 4 (scale should be 1:1). Keys from York (Anglian), Rogers, *Fishergate* pp. 1423-5, no. 5240, and (Anglo-Scandinavian), Ottaway, *Ironwork from Coppergate*, p. 677, nos 3671-3.

198. Examples from York, MacGregor, Industry and commerce in Anglo-Scandinavian York, pp. 44-5, fig. 27, no. 2, and Beverley, I. H. Goodall, Padlock, in P. Armstrong and D. Tomlinson, *Excavations at the Dominican Priory, Beverley, 1960-83*, Humberside Heritage Publication **13** (Hull, 1987), pp. 37-8.

199. e.g. from: Thwing, I314-20; Goltho, Goodall, *Goltho*, p. 184, nos 132-3; Thetford, Goodall, *Excavations in Thetford*, p. 98, nos 235-45; York, Ottaway, *Ironwork from Coppergate*, pp. 681-6; Rogers, *Fishergate*, pp. 1346-8, nos 5044-5.

200. Examples of buckles in graves from Süderbrarup (Schleswig-Holstein), E. Aner, Die wikingerzeitliche Kammergräber am Thorsberger Moor, *Offa* **11** (1952), pp. 60-77, at pp. 65 and 70-1, and Thumbby-Bienebek, M. Müller-Wille, *Das wikingerzeitliche Gräberfeld von Thumbby-Bienebek (Kreis Rendsberg-Eckenförde)*, **1** (Neumünster, 1976), p. 31 (for discussion), Taf. 29, nos 2 and 5.

201. Ottaway, *Ironwork from Coppergate*, pp. 687-8, nos 3746 and 3759.

202. Ottaway, *Ironwork from Coppergate*, pp. 691-2, nos 3795-6.

203. S. Grieg, *Viking Antiquities in Scotland, Viking Antiquities in Great Britain and Ireland* **2**, ed. H. Shetelig (Oslo, 1940), p. 61, fig. 34.

204. For Birka, B. Arrhenius, Bügelfibeln, *Birka II, 1: Systematische Analysen der Gräberfunde*, ed. G. Arwidsson, (Stockholm, 1984), pp. 39-44; see also, for example, H. Simonsson, En senvikingatida gravfält från Västmanland, *Fornvännen* **64** (1969), pp. 69-89 at p. 73, fig. 5.

205. See Part 2, p. 9.

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207. For Northampton, see note 203 above; Lincoln, Flaxengate, sfno. Fe75, 2552, and Repton, sfnos 4809 and 5257.

208. Examples from Hamwic, e.g. SOU15.8, SOU31.150; Ramsbury, Evison, *Ramsbury*, p. 35, no. 6; York, Ottaway, *Ironwork from Coppergate*, pp. 690-1, nos 3789-93.

209. Non-ferrous strap-ends from Hamwic, Addyman and Hill, Saxon Southampton, pp. 68-70, nos 1-4, and York, D. M. Wilson, Two ninth century strap-ends from York, *Medieval Archaeol.* **8** (1964), pp. 214-6.

210. Müller-Wille, *Thumbby-Bienebek* **2** (Chamber grave 37A, bridle 1), p. 38, Abbildung 6, Taf. 81, nos 16-7.

211. Examples from: Cottam, Ottaway, Iron objects, p. 77, illus. 50, nos 37-43; Flixborough (over 100), Ottaway, *Life and Economy*, pp. 38-9, nos 683-797; York (Anglian), Rogers, *Fishergate*, pp. 1367, nos 5054-67; and (Anglo-Scandinavian), Ottaway, *Ironwork from Coppergate*, pp. 690-1, nos 3798-3801.

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217. Goodall, *Object and Economy*, p. 1042, no. 3878.

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Ottaway, *Ironwork from Coppergate*, nos 3836 and 3838. For a survey of spur development in Europe, R. Koch, *Stachelsporen des frühen und hohen Mittelalters*, *Zeitschrift für Archäologie des Mittelalters* **10** (1982), pp. 63-84.

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222. Ottaway, *Ironwork from Coppergate*, pp. 702-3, fig. 305.

223. For the role and status of the mounted warrior in Late Anglo-Saxon England, and a summary of artefactual evidence, J. Graham-Campbell, *Anglo-Scandinavian equestrian equipment in eleventh century England*, *Anglo-Norman Studies XIV, Proceedings of the Battle Conference 1991* (Woodbridge, 1992), pp. 77-89.

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227. Wheeler, *London and the Vikings*, p. 42, fig. 20, nos 1-2.

228. Examples with round and rectangular eyes from Thetford, Goodall, *Excavations in Thetford*, pp. 99-100, no. 258, York, Ottaway, *Ironwork from Coppergate*, p. 706, no. 3849, and Waterman, *Late Saxon, Viking and early medieval finds*, fig. 8, nos 1-2. Examples with two round eyes from: London, Wheeler, *London and the Vikings*, p. 42, fig. 20, nos 1-2.; Goltho, Goodall, *Goltho*, pp. 184-5, no. 161; Thetford, Goodall, *Excavations in Thetford*, pp. 99-100, nos 259-61; Winchester, Goodall, *Object and Economy*, pp. 1043-4, nos 3881-3.

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1999. Complete example of bit with strap-joiner made in one piece with the bar from York, Waterman, Late Saxon, Viking and early medieval finds, pp. 74-5, fig. 8, no. 1, and single component of a bit of similar form from Thetford, Goodall, *Excavations in Thetford*, pp. 99-100, no. 249.

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236. Winchester, Goodall, *Object and Economy*, pp. 1054-6, nos 3939-43; and (Sussex Street) Rees et al., *Artefacts and Society*, pp. 292-5, fig. 166, nos 2030-2, 2037; York, MacGregor, *Anglo-Scandinavian Finds*, p. 83, no. 437; and Ottaway, *Ironwork from Coppergate*, pp. 707-9. Other Late Anglo-Saxon horseshoes from: Cheddar, Goodall, *Cheddar*, p. 267, no. 7; London (Ironmonger Lane), sfno. 153 (unpublished); Portchester Castle, Hinton and Welch, *Portchester 2*, p. 197, no. 9; Thetford, Goodall, *Excavations in Thetford*, nos 277-95 (not all necessarily pre-Conquest), and Goodall and Ottaway, *Excavations in Thetford*, pp. 110-11, no. 138.

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242. G. R. Owen-Crocker, *Dress in Anglo-Saxon England* (Manchester, 1986), pp. 171-2.

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248. Evans and Loveluck, *Life and Economy*.

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Later two tribes: Angles and Saxons united and were called Anglo-Saxons. They called their country "England" or "the Land of Angles". 1. The Saxons were looking for the new places. The Anglo-Saxons settled in many different parts of the country – the Jutes in Kent, the Angles in East Anglia, the Saxons in parts of Essex, Wessex, Sussex and Middlesex. Early Anglo-Saxon villages were named after the leader of the tribe that is for everyone to know who was in charge. For example. Anglo-Saxons set up their ham or home, for example Billingham or Clapham, and their ton or town, for example, Harlington or Brighton, near the mouth of a river or in a sheltered bay. These names are still written on the maps today. Even now many towns and villages still carry their Anglo-Saxon names. Anglo-Saxon England was an era marked by vicious bloodshed, religious fervour, and warring kingdoms. Yet it also saw the development of great art, poetry, and institutions from which emerged the unified kingdom of England, belying the popular characterisation as a "dark age". The Anglo-Saxons were Germanic tribes that immigrated to England, either via invitation, hired as mercenaries by the Romano-British, or through invasion and conquest. Originally worshipping pagan gods, it was this period that saw the spread of Christianity throughout England. Credit: self/cc-by-sa-3.0. There were two standout Mercian kings. The first was under Penda, during the mid 7th century. Penda is known as the last great pagan king and was supposedly a fierce warrior. "Anglo-Saxon elves (Old English *Ǽlf*) are one of the best attested non-Christian beliefs in early medieval Europe, but current interpretations of the evidence derive directly from outdated nineteenth- and early twentieth-century scholarship." Pinder Volume 3: The Ruler Portraits of Anglo-Saxon England Catherine E. Karkov Volume 4: Dying and Death in Later Anglo-Saxon England Victoria Thompson Volume 5: Landscapes of Monastic Foundation: The Establishment of Religious Houses in East Anglia, c. 650–1200 Tim Pestell Volume 6: Pastoral Care in Late Anglo-Saxon England Edited by Francesca Tinti Volume 7: Episcopal Culture in Late. Iron production in early Anglo-Saxon England should also be sought after using archaeological prospection techniques. Sites showing evidence of iron smelting during the Anglo-Saxon period. Several of the sites may correspond with smelting evidence held in the National Slag Collection (Shakenoak: code NSC Box 023; Ramsbury: code ?NSC Box 084U; Asheldham: code NSC Box 071A). Figures - uploaded by Thomas Birch. blacksmiths' products of the mid-late Anglo-Saxon period provides a detailed account of ferrous artefacts found in England (Ottaway, 1995). Ottaway argues that the development of the blacksmith's craft was a continual diversification of the smith's repertoire for the. THE PRODUCTS OF THE BLACKSMITH IN MID-LATE ANGLO-SAXON ENGLAND By Patrick Ottaway. www.pjoarchaeology.co.uk Part 2. Contents Knives Other tools and implements Structural ironwork and fittings Locks and keys. One of the commonest iron objects encountered on Anglo-Saxon sites is the tanged knife. A substantial body of data on the metallographic structure of Anglo-Saxon knives and scramasaxes is now available, a most important component of which has come from the examination of seventh - eleventh century knives from York.127 The evidence from both knives and other edged tools shows that in both the Middle and Late Anglo-Saxon periods smiths were very skilled in manufacturing hard steel edges.