

Wandsworth's industrial transformation, c 1634–90

DORIAN GERHOLD

Wandsworth attracted little industry until the 1630s, despite its considerable advantages – a powerful river for driving mills, plenty of clean water, a Thames-side position for bringing in coal and proximity to London. New industries then arrived: frying pans and armour plate in the 1630s, copper, gunpowder, dyeing and bleaching in the 1650s, and calico printing, hatmaking and leather in the 1680s. By the 18th century Wandsworth had as great a range of industries as any parish in the country. Its story highlights the crucial role of foreign workers in bringing new skills to England, the role of London's environs as a source of power and clean water for industrial processes essential to the city, and the role of Londoners and the London market in promoting new industries and technologies.

Wandsworth had powerful attractions for industry: it had one of the best rivers for driving mills in the country (the Wandle, which fell on average 14 feet per mile), it had abundant clean water from the Wandle for processes such as dyeing and bleaching, it was beside the Thames, which meant coal was available reasonably cheaply, and it was only 5 miles from London. Yet before the 1630s Wandsworth (like the Wandle in general) attracted little industry other than corn-milling. One or more of its mills was used as a fulling mill intermittently from 1303 to 1624, one was used for grinding brazil wood to make a dye in the first half of the 16th century,¹ and there was a brewery by 1576 and possibly by 1529² (which ceased operating only in 2006). In the 1560s the Society of Mineral and Battery Works planned to set up a copper smelting works at Wandsworth, but then found ore near Bristol, where fuel was cheaper.³ When those who gained employment from the Wandle mills protested against plans to take some of the river's water in 1610, all the mills in Wandsworth were corn mills, and there was no indication of any other sort of mill anywhere on the Wandle.⁴ Almost as remarkable was the large gap between the southernmost mill in Wandsworth (Adkins Mill) and the next mill to the south (apparently the later iron mill),⁵ indicating that the Wandle was not fully exploited in 1610. Indeed, before the 1630s London seems to have used the nearby waterpower largely for corn milling, with only a handful of mills serving other purposes such as fulling, papermaking, gunpowder manufacture and metalworking.⁶

In Wandsworth the situation changed completely in the 17th century. Starting in or about 1634 new industries were established there; one in the 1630s, four in the 1650s and three in the 1680s (fig 1). They were intimately connected with London, in some cases being mere adjuncts to larger businesses located in the city, and their development in Wandsworth was an aspect of the growth of London itself. Also notable is the importance of foreign workmen

¹ Gerhold & Ensing 1999, 17, 20–1. The name 'brasalle mille', first recorded in 1569, persisted long after the mill had become a corn mill again; the period when it ground brazil wood was probably the early 16th century, after William Gardynere, a grocer, acquired the lease, and may well have ended before 1569 (*ibid.*, 17–18).

² The brewery existed by 1576 (Osborn 1999, 33); the Ram inn (after which the brewery was named) existed by 1529 (TNA: C 1/767/48).

³ Donald 1961, 87.

⁴ Giuseppi 1908, 170, 177–91.

⁵ Milward 1969, 30–1. But NRO: Spencer papers, 7j3, survey of Wimbledon manor 1617, seems to refer in Wimbledon parish only to the Merton Mills even further south.

⁶ Based largely on volumes of the *Victoria History of the Counties of England*, for Essex, Kent, Middlesex and Surrey. The metalworking mills were the iron mill at Crayford (1595) and the copper and brass mill at Isleworth (mentioned by Norden) (Gerhold 2009, 38; *VCHM*, 2, 128).

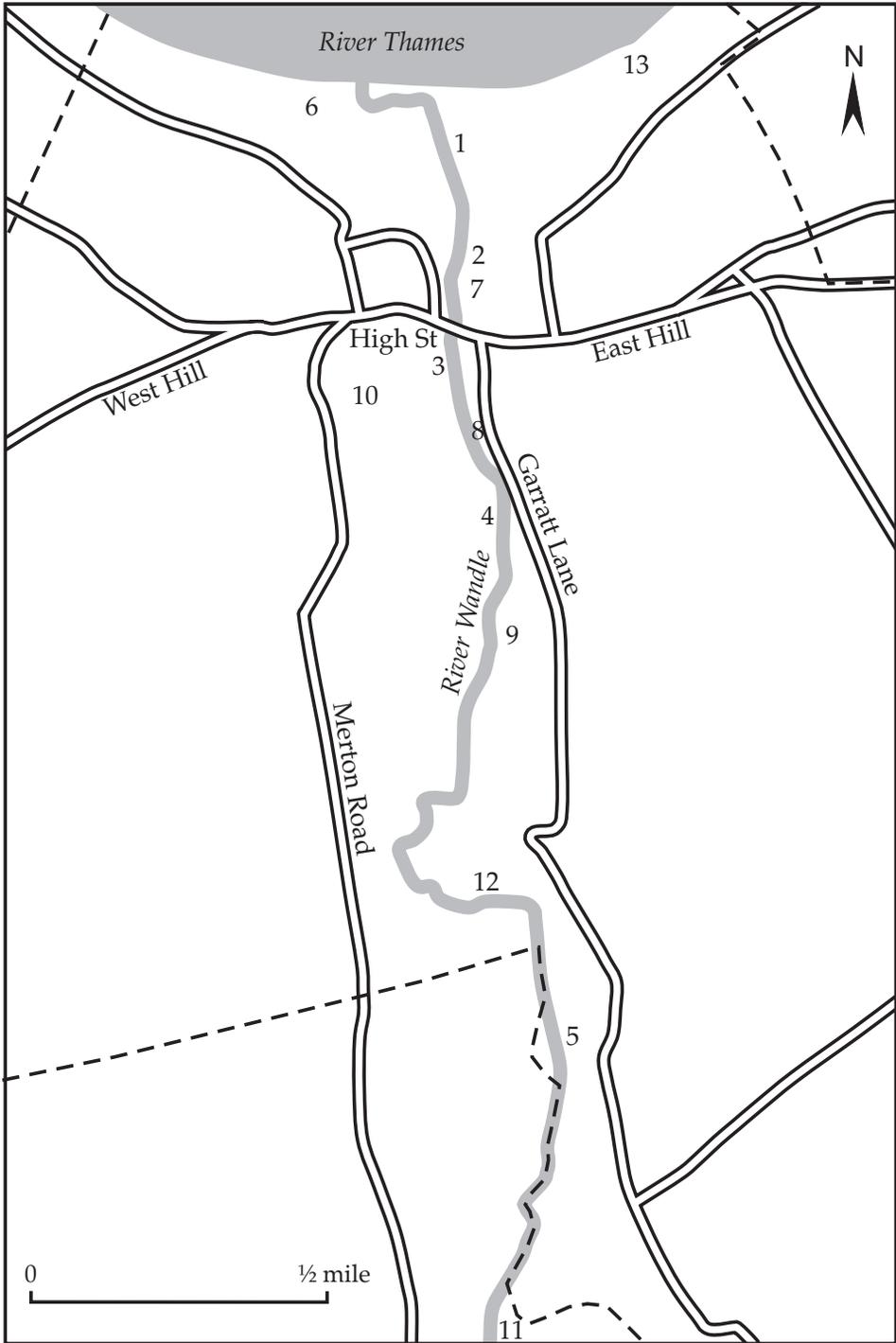


Fig 1 Map of sites in Wandsworth mentioned in the text, showing the river Wandle, roads and Wandsworth's parish boundary (dashed line). Key: 1 Lower Mill; 2 Middle Mill; 3 Upper Mill; 4 Adkins Mill; 5 Gunpowder mill; 6 Frying pan works, Point Pleasant; 7 Pluyme's dyehouse; 8 Hebert's dyehouse; 9 Pillett's bleaching site; 10 Owsley's bleaching site; 11 Garratt Print Works; 12 Duntshill Mills print works; 13 Gunpowder houses.

in their development, reflecting the dependence of England's early industrial development on skills brought from abroad.

Frying pans and armour plate

The first of the new industries was iron battery: the hammering or 'battering' of iron bars into iron plates used to make armour plate and frying pans.⁷ Robert Plot in 1686 emphasised the exceptional skill required for frying-pans. They were made in nests of nine to preserve the heat and prevent scaling, and he noted that 'the Secret in great measure consist[s] in the regulating the heat':

Now that which renders this Art of making fryingpans so difficult, is not only the bringing them to a just heat, which shall hold a sufficient time and yet not make them lyable to stick in the hammering; but the number of hammers used in this work, which are not less than twenty of several sorts: which so few know how to manage, or are capable of learning; that there are but two Master Frying-pan makers (as I am credibly inform'd) in the whole Kingdom: one, here at New-Castle [-under-Lyme], and another at Wansworth in Surrey.⁸

The start of the manufacture in England was in fact at neither of those places but at Stanton Drew in Somerset. In, or shortly before, 1601, Sir John Cowper, who had 'an old iron worke' there, was persuaded by the Armourers' Company of London to convert it to making plates for armour, which was said to be much needed by the government (presumably because of the Irish revolt of 1595–1603).⁹ By 1611, and possibly from the start, the chief workman was Cornelius Hallen, who was certainly a foreigner and probably from Mechelen in what is now Belgium.¹⁰ His family were to dominate the manufacture of frying pans in England for six generations and almost two centuries. Challenged by the Governors of the Mineral and Battery Works about infringement of their monopoly, Hallen and others insisted (credibly in view of their later activities) that they had undertaken only 'the making of plates for armour and pannes'.¹¹ Their output combined a consumer product and a military one.

At Wandsworth the pattern was similar to that in Somerset and at most subsequent Hallen sites: there was a mill (at Wimbledon) where waterpower was used to hammer iron bars into plates, and a separate site not too far away at Point Pleasant by the Thames in Wandsworth with easy access to coal for heating the plates to make frying pans. The coal came via the Thames. The start of this activity can be dated reasonably precisely to 1634. A map of part of Wandsworth in 1633 shows Point Pleasant as empty fields, whereas a member of the Harrow family, later recorded as batterers, was baptised at Wandsworth in 1635. In Wimbledon 'James s. of Lynbborde Eroe, a stranger' (almost certainly from the Harrow family) was baptised in August 1634, 'John Penner, a forraner' was married in July 1634 and 'Tussen a freshman from the Irone Myles' was buried in 1636.¹²

The chief workman at Wandsworth was Cornelius's son William. Martha, daughter of 'William Hollone & Margrete' was baptised at Wimbledon in 1650 ('Holone iron mill' being added in the margin of the register) and Samuel Holland, son of William Holland of Wandsworth, batterer, was apprenticed to a member of the Armourers' Company in 1652.¹³ The other link with Stanton Drew was Edward Barker, an iron merchant. Barker was selling

⁷ This section is a shorter version of part of Gerhold 2009, which covers all the Hallens' frying-pan works.

⁸ Plot 1686, 335–6.

⁹ TNA: E 112/118, no 348.

¹⁰ *Ibid.*; Hallen 1885, discussed in Gerhold 2009, 54, note 1.

¹¹ TNA: E 112/118, no 348.

¹² SHC: 3991/1; Squire 1889, 306; Clarke 1924, 15, 101, 140.

¹³ Clarke 1924, 18; Webb 1998, 29.

frying pans in Bristol in 1635 and later occupied the mill at Stanton Drew, and he owned the frying pan works at Wandsworth and the iron mill at Wimbledon by the 1660s and probably from the start.¹⁴ It was undoubtedly Barker who financed the enterprise at Wandsworth and Wimbledon.

The Wimbledon mill, which may previously have been a fulling mill, was described by Barker in 1664 as ‘annient mills of very great use for makeing of armour plate and other iron plate’. Although the Wandle was a powerful river, Barker was sometimes short of water: ‘he had two glasses that rann twelve houres each to shew his workemen how to divide the time of theire worke betweene this defendants two mills, he not haveing water inough then to keepe them both going togeather’. (‘Two mills’ perhaps meant two wheels.) Barker complained that the recently erected gunpowder mills downstream caused the water to rise 3 feet higher than before, rendering his mills useless, but either he exaggerated or some compromise was reached, since both the gunpowder mills and the iron mill continued.¹⁵

The Point Pleasant site consisted of three former open field strips at right angles to the Thames, cut across at the southern end by what is now Putney Bridge Road, together with part of a meadow by the Thames. The present Queen Adelaide public house stands on the south-east corner of the middle strip. A warehouse (fig 2) and wharf were built on the meadow, the easternmost strip (of 1 acre) became a road leading to the Thames, cottages and forges were built for the frying pan makers on the middle strip (of 2 acres), and the westernmost strip (also 2 acres) became gardens to the frying pan houses (in 1687 ‘a great part’ of it had been ‘inclosed and converted into gardens by the workmen of Edward Barker gent deceased at the fryin pann houses’).¹⁶ The hearth tax list for Wandsworth in 1665, which is in topographical order, brackets together fourteen houses here, stating ‘Barker lanlord’, and then: ‘These be the fryinge pan houses they have but one or 2 chimneys apeece the others are forges and Mr Barker theire lord hath certificates for them they are all Dutchmen’.¹⁷ The numbers of hearths ranged from one to five. Edward Barker himself had a ten-hearth house nearby.

John Aubrey in 1672 or later also referred to Dutchmen: ‘At Wansworth is a manufacture of brass plates, for kettles, skellets, frying pans &c. by Dutch men, who keep it as a mystery’ (the reference to brass is an addition, which may be much later than 1672).¹⁸ ‘Dutchmen’ was a somewhat vague term, then used more widely than for inhabitants of what is now the Netherlands. For example, Nicholas Tonnett, one of the ‘Dutchmen’ listed at the frying pan houses in 1665, evidently prospered at Wandsworth and left £200 to the parish for the poor and £260 to John Brodrick, of which £160 also found its way to the poor. Tonnett was described as a French Protestant both by the churchwardens and by Brodrick.¹⁹

This makes it likely that Tonnett came from the bishopric of Liège (now in eastern Belgium), one of the greatest metalworking and arms manufacturing areas of Europe, where a French-speaking and apparently largely Calvinist population was ruled by a Catholic bishop. It was in the 1620s and 1630s that ironworkers were migrating from there in very large numbers to Sweden, where they founded the Swedish iron industry, leaving the Liège area for economic reasons rather than religious persecution.²⁰ Tonnett may have been the Nicholas Tonnett baptised at Jemeppe near Liège in 1623, though this is impossible to prove. In another case a Wandsworth frying pan maker can be proved to have come from Liège: ‘Hubert Harro, fils de Perpiti, natif de Liege’, clearly the Hubbier Harrow of the Wandsworth

¹⁴ TNA: C 8/77/26; SRO: DD/OB 103/1; below.

¹⁵ TNA: E 112/521, no 144; below.

¹⁶ NRO: SOX 282, St John to Barker; SOX 276, St John to Lardner; SOX 252, Spencer to Gattey and Waller; BL: Add 78154, survey of Wandsworth 1706; LA: VI, 258.

¹⁷ TNA: E 179/188/489A.

¹⁸ Aubrey 1719, I, 14 (based on material collected by Aubrey in 1672 but later updated; Gerhold 2009, 46–7).

¹⁹ TNA: PROB 11/495, John Brodrick; Squire 1887, 232–3.

²⁰ Hildebrand 1992, 98–9; Douhan 1985, 3, 194–6.



Fig 2 A riverside warehouse at Wandsworth, drawn by Grimm in about 1770. This was almost certainly Edward Barker's warehouse at Point Pleasant, since there is no evidence of other warehouses of the relevant period on Wandsworth's riverside. (BM: 1919,0712.48)

register, was married at the French Church in London in 1630,²¹ though equally clearly he was already in England before panmaking began at Wandsworth. Others mentioned in the Wandsworth register as 'batterers' included Perpete Harrow, Isaac Lake, Simon Barlow and Joseph Nunnett. Barker's origins are unknown. He was born in about 1605 and was living at Wandsworth by 1642, though he also had a house in London. During the Civil Wars he was a major arms supplier, being the chief supplier of the Eastern Association from 1644, though there is no evidence of him being directly involved in the manufacture of arms other than armour. He chiefly provided muskets, pistols and swords and also substantial quantities of armour.²² Barker not only owned the land at Wandsworth but as far as the frying pans were concerned provided the raw material, paid the workmen for what they produced and marketed the product.²³

From Wandsworth the Hallen or Holland family took iron plating and frying pan manufacture to the Midlands: to Coalbrookdale by 1647, Stourbridge by 1650 and Newcastle-under-Lyme by 1654. In each case the Hallens were involved from the beginning until the manufacture ended in the second half of the 18th century (probably being put out of business by improved techniques for making cast-iron frying pans, which rendered their expertise in wrought iron pans redundant).²⁴ They did not immediately abandon Wandsworth. William Hallen died at Wandsworth in 1656, and his son Samuel Hallen is

²¹ LSA: index of Jemeppe register; *RFC*: 1, 28.

²² Squire 1887, 61; Holmes 1974, 151; Edwards 2000, 150; information from Professor Peter Edwards.

²³ TNA: PROB 11/341, Edward Barker; PROB 4/8676.

²⁴ Gerhold 2009, 44, 53.

recorded there in 1661.²⁵ There are no further references to Hallens at Wandsworth, but the manufacture evidently continued. Edward Barker's will of 1670 refers to 'all working tooles bellowes weights beames and scales and all goeing geeres whatsoever belonging to my plate mills workhouses and fforges' in Surrey, Somerset and Bristol. His inventory records an immense quantity of stock at Wandsworth, including frying pans, dripping pans, chafing dishes, iron plates and plate iron, valued at £1332 7s 7d. This suggests something like 80 tons of iron. A similar stock at Bristol was valued at £805. His debtors were chiefly London braziers and ironmongers, but included a Norwich ironmaster, a Kingston ironmonger and a London armourer.²⁶ The works passed to his son Edward. Many of the batterers listed in 1665 were still in Wandsworth in the 1680s. Robert Plot indicated in 1686 that frying pans were still made at Wandsworth, and Edward Barker II took a new lease of the main part of the Point Pleasant site in 1687.²⁷ Armour plate as well as frying pans continued to be made until at least 1687. Edward Barker referred to armour plate in the legal proceedings of 1664, Joshua Nonnet, whose widow occupied one of the frying pan houses in 1665, was receiving a government salary as a 'hammerman' in the armoury in 1664 or earlier, and Isaac Leot, mentioned in the Wandsworth register in 1647 and 1661, was supplying armour to the Tower in 1678 and described himself as an armourer of Wandsworth when he made his will (witnessed by Edward Barker II) in 1687.²⁸

After 1687, the Point Pleasant site is next recorded in the ownership of the Essington family. Peter Essington was the son of a London goldsmith, but had been apprenticed to a brazier and had copper items made for himself at the copper mill at Esher. By 1704 he and James Robinson (owner of an earlier copper mill in Wandsworth) were occupying what had been the Wimbledon iron mill, which, given their background in copper, was probably by then a copper mill.²⁹ The same had happened to the Stanton Drew mill in the 1690s, though the Hallens' Midlands sites continued to use iron.³⁰ Peter Essington died in 1705³¹ and, as his widow Margaret owned the frying pan works by 1709, it is likely that he had acquired this too and converted it to copper working. England's copper industry was growing, and copper frying pans, which conduct heat more quickly and evenly than iron ones, were apparently gaining ground against iron frying pans at around this time.³² Probably the mill continued to make plates for frying pans, though now of copper rather than iron. By 1709 the premises were being worked by Peter's son John. In that year Margaret denied reports that she had transferred the frying pan works and copper works away from John, thereby making clear that frying pans were still being made. There was a warehouse in London, near Queenhithe, where John attended from Wednesday until noon on Saturday.³³ In 1711 Margaret conveyed to John 'all her stock in ye copper & iron trade', said to be worth £2000. John's downfall seems to have come about through involvement in the English Copper Company. In 1720, for reasons unknown, he and his partners in the Wimbledon copper mill transferred their rights in the mill to the company in return for shares and to buy additional shares, which subsequently lost their value. By 1727 he was bankrupt, and he died in 1729.³⁴

The mill continued as a copper mill, but in separate ownership from the Point Pleasant site. The latter remained in the hands of daughters of John Essington until 1751, when it passed to George Pengree of Snow Hill, London, brazier, and Edward Brice, linen-draper

²⁵ Squire 1889, 325; Webb 1998, 57.

²⁶ TNA: PROB 11/341, Edward Barker; PROB 4/8676.

²⁷ Gerhold 2009, 55, note 33; Plot 1686, 336; NRO: SOX 282, St John to Barker.

²⁸ Above; TNA: PROB 4/4781; Squire 1889, 67, 331; Richardson 2004, 59; TNA: PROB 11/389, Isaac Leot.

²⁹ Webb 1998, 18; TNA: C 7/506/63; LMA: SKCS 42, p 169ff; below.

³⁰ Gerhold 2009, 46–7.

³¹ TNA: PROB 11/483, Peter Essington.

³² Roberts 1981, 46.

³³ *Post-Man*, 31 January, 2 March 1708.

³⁴ TNA: C 11/1472/32; *Articles* 1720; *Proceedings*, 26 September 1729; SHC: G145/7, 70. For John Essington's lease of the mill, see TNA: C 11/2/9; C 11/1225/57.

of London. Pengree occupied a house on the site, which suggests that the manufacture of copper frying pans continued. There is a reference in 1754 to 'a manufacture here [Wandsworth] of brass plates for making vessels'. The end seems to be marked by a lease of 1771 to Joseph Gatty and William Waller, who were chemists.³⁵

Copper

Copper working began at Wandsworth in 1654 and continued for about 120 years. The first copper mill – the earliest anywhere on the Wandle – was Adkins Mill, situated behind the present Old Sergeant public house in Garratt Lane. Adkins Mill already had a long history, being first recorded in 1363–4, and it seems to have been a fulling mill in the 1620s.³⁶ In June 1654 it was leased for 30 years by Alderman Walter Pell of London to Henry Robinson, Richard Wilks, Thomas Draycot and William Roberts, citizens and armourers of London, for a £200 entry fine and £100 a year. Wilks was also described as a brazier – a dealer in brass (then an alloy of copper and either zinc or tin) – and this probably applied to all of them, with 'armourers' referring to their livery company rather than their trade. They immediately set about converting Adkins Mill into a copper mill, 'for the melting and fforgeing of copper and other metall', at a cost of £120 each.³⁷ This was a good time to do such a thing, since the defeat of the king in the Civil Wars of the 1640s had made the monopoly of brass manufacture granted by the Crown to the Mineral and Battery Works ineffective. As already indicated, the attraction of Wandsworth was that it combined the power of the Wandle needed for hammers and bellows (this was another battery process) with proximity to the Thames for cheap carriage of heavy goods such as copper and coal. Adkins Mill was usually described as two mills under one roof, and at first only one of these was converted to a copper mill. The other was let to a succession of corn millers: George Buddle in 1658 (for £48 a year), Henry Chinnall in 1661 (for an entry fine of £180 and £50 a year) and Christopher Heycocke from 1666 until at least 1670.³⁸

It was agreed in May 1655 that, for the next three years, each of the four lessees would pay fixed rates for using the copper mill: for copper 'forged out of bowles into plates' 22 shillings per cwt and for copper 'forged out of bowles & made for kettles' or 'melted & raised into kettles' 28 shillings per cwt.³⁹ (Kettles were straight-sided vessels, usually with handles, used for heating water.) After the rent and the wages of the mill's workers had been paid, the mill's income would be distributed equally between them. Once the three years ended there was no formal agreement: each used the mill at his own charge, and costs such as repairs were paid in proportion to the copper or other metal each of them worked there; the rent was divided equally.⁴⁰ Partitions were placed in the mill's barn so that each could keep his own coal separately.

The mill was managed at first (apparently only briefly) by Anthony Lesow, and subsequently by his brother, Nicholas Lesow, coppersmith, who began working at the mill in 1654, at the age of about 21. The Lesows may well have come from a metalworking area on the Continent, given their foreign-sounding name, and in 1662 Anthony Lesow was said

³⁵ TNA: C 12/2372/10; NRO: Spencer papers, 7d1, Wandsworth freehold rental; Cartwright 1889, 171; NRO: SOX 252, Spencer to Gattey & Waller.

³⁶ Gerhold & Ensing 1999, 19.

³⁷ TNA: C 6/218/32. 'Other metall' could indicate the making of brass, and Wilks had brass goods in his London shop in 1671, but brass is never mentioned in connection with the mill and it is never referred to as a brass battery mill.

³⁸ TNA: C 38/158, Roberts *v* Wilks; E 112/522, nos 224, 225 & 255; SHC: Quarter Sessions typescript, October 1669; SHC: K61/5/57.

³⁹ TNA: C 24/883, Roberts *v* Wilkes, evidence of Nicholas Leasow for defendants; C 6/218/32. The latter also refers to 6s per cwt for forging of plates (perhaps the thick plates mentioned by Lesow).

⁴⁰ However, the Master's Reports cited below appear to be based for the period after May 1658 on the 1655–8 arrangements for using the mill.

to be overseas, though their foreign origin is uncertain.⁴¹ Nicholas Lesow was paid according to how much work he did: 5 shillings per cwt for working of plates, 8 shillings per cwt for working of kettles and 2 shillings per cwt for working of thick plates. He also kept the accounts.⁴²

Copper and coal were brought from London by boat, and the worked copper was sent back there by boat. The copper was either imported ingots or scrap, since only poor-quality copper ore had been found in England at this time⁴³ and there is no evidence that ore was being smelted at Wandsworth; indeed the wording used in the 1650s ('melting and fforgeing') indicates the limited range of operations carried out. In 1658, Christopher Jones of Wandsworth, waterman (whose daughter Nicholas Lesow married in 1662), was carrying copper and coal between Wandsworth and London; Richard Aldridge of Wandsworth, yeoman, was carrying copper between the mill and the Thames; John Merritt of Bermondsey, blacksmith, was making and repairing the hammers used to beat the copper; Mr Hatton was oiling and mending the bellows, and Henry Ingram of Bromley, yeoman, was supplying charcoal.⁴⁴ For comparison, at Merton copper mill in 1725, charcoal was used to melt the copper, but coal or the lowest-quality charcoal was used to heat it ready for the hammer.⁴⁵

For one short period (25 March to 27 August 1658) there is some indication of the quantities of copper worked. For each of the four lessees the income accruing to the mill from their working of copper (before deducting the payment to Lesow) is recorded. If the average per hundredweight for working copper into plates and into kettles is taken (25 shillings per cwt), 2.4 tons was worked up to 8 May and a further 4.7 tons up to 27 August (about 1¼ cwt and 1 cwt per working day respectively). Assuming these quantities were typical of the whole year, annual production was just over 16 tons.⁴⁶ It was therefore a significant mill, since England's annual consumption of copper in the 1680s has been estimated at only about 100 tons.⁴⁷

The copper was 'wrought into vessells', both at the mill and in London. Probably the more detailed work, requiring heat but not powered hammers, was carried out in London. Richard Wilks' inventory, from 1671, provides a detailed picture of one of the businesses. Wilks had houses both in Tower Street in the City and at Wandsworth, of similar size and with household goods of similar value (£68 and £67 respectively). At the mill Wilks had 21 cwt of 'corse copper' (£74), copper (£62), 'coales sea coale & charcoale' (£15) and a half-share of the tools including hammer, anvils, shears and bellows (£35). However, in the shop and cellar in Tower Street, evidently the centre of the business, were copper, copper and brass goods and equipment valued at £1030, including nearly 10 tons of copper and copper and brass goods. The most valuable items were 40 cwt of 'plates & bottomes' (£262), 25 cwt of 'copper shrufe' or scrap (£131), 26 cwt of brass kettles (£168), 10 cwt of copper bars (£63), 7 cwt of copper kettles (£47), 5 cwt of 'guiney pans' (£36) and 5 cwt of 'wrought copper' (£35), but there was a wide range of other items including money plates, stew pans, raised and cast skillets, 'wrought covers' and 'brayed basons'. The tools were '1 pr large sheeres, 1

⁴¹ A possible English derivation is from 'leasow' – an enclosed pasture.

⁴² TNA: C 24/883, *Roberts v Wilks*, evidence of Nicholas Leasow; C 6/218/32.

⁴³ Day 1991, 137.

⁴⁴ TNA: E 133/106/23; C 24/883, *Roberts v Wilks*; WHERS: MS list of Wandsworth marriages outside Wandsworth, p 5.

⁴⁵ LUL: MS 7.1 (23), p 40.

⁴⁶ This paragraph is based on the Master's Reports in TNA: C 38/152, *Roberts v Wilks* and C 38/158, *Roberts v Wilks*. Up to 8 May 1658 the cost of coal and charcoal may have been deducted, so the gross payments and thus the amount of copper would be somewhat greater. However, applying the average of the payments to Lesow (6 shillings and 6 pence, ignoring the 2 shillings for thick plates) to the sums specified in the Master's Reports for servants' wages indicates 2.1 and 4.2 tons for the two periods, compared to 2.4 and 4.7, so the figures are unlikely to be far from the reality. Net income (after payment to Lesow) was just over £137, indicating about £319 for the whole year, far more than was needed to pay the rent of the mill.

⁴⁷ Jenkins 1943–5, 73.



Fig 3 Residences of debtors to Richard Wilks in 1672, listed in his inventory (TNA: PROB 5/2924).

wise, 2 anvills, 1 pr of bellows forge iron & tongs'. Only in a few cases is the residence of Wilks' debtors recorded, but this is enough to show that he had customers throughout the country (fig 3). In his will Wilks left 20 shillings each to twenty of his chapmen, who were presumably travelling around the country selling his plates and kettles – a rare glimpse of how Wandsworth's manufactures were marketed.⁴⁸

Disputes soon arose between the four lessees or their heirs, giving rise to informative legal proceedings. William Roberts was found murdered in a pond at Hackney in 1658 and the remaining lessees managed to prevent his heir obtaining his share. Draycot by 1670 had mortgaged his interest to James Henks and made little further use of the mill. In 1672 he was in King's Bench Prison, and Robinson, perceiving him to be 'not of a temperate life', was said to be taking his side against Henks in order to ensure control of the mill when he died. Wilks died in 1671, and Robinson then had the mill to himself, beating off legal challenges from Draycot.⁴⁹

Three generations of Robinsons ran the copper mill. Henry Robinson died in 1677, leaving everything to his son James. James acquired part of the former iron mill in Wimbledon by 1704, retaining it until his death. In 1705 he was Master of the Armourers' Company, as his father Henry had been in 1670. He died in 1712, describing himself in his will as a brazier

⁴⁸ TNA: PROB 5/2923; PROB 5/2924; PROB 11/344, Richard Wilkes. Values and weights have been rounded to the nearest pound and hundredweight respectively. The difference in value per cwt between copper scrap and plates (103s and 126s respectively) and copper scrap and copper kettles (103s and 140s) is not far from the sums agreed to be paid for use of the mill in 1655.

⁴⁹ TNA: C 6/218/32; E 112/522, nos 224 & 255; C 24/883, Roberts *v* Wilks; SHC: Quarter Sessions typescript, October 1669; TNA: C 6/218/32.

of London. Property in Wandsworth, including his dwelling, was left to his son James and property in Wimbledon to his son Henry, though Henry seems to have taken over the interests in both copper mills, keeping them until his death in 1762. Nicholas Lesow, who died in 1681, and his son of the same name, who died in 1716, continued to serve the Wandsworth mill. The first Henry Robinson left a bequest to Nicholas senior, describing him as his workman at the copper mill, and James Robinson did the same for Nicholas junior, who was described on his death as a coppersmith.⁵⁰

By 1697 another copper mill had been established at Wandsworth. Edward Collingwood, brazier of Wandsworth, referred to his lease of it in his will of that year. His successor's will described it as 'one halfe part' of 'the Middle Mills', belonging to members of the Smith family of Mitcham. This was not the later Middle Mill, near Wandsworth Plain, which never belonged to the Smiths, but the later Upper Mill, south of Wandsworth High Street (on a site now covered by Wandsworth Shopping Centre), which was sometimes known as the Middle Mills and did belong to the Smiths. Later evidence indicates that the copper mill was the western part of the mill (the eastern part was an oil and leather mill by 1721).⁵¹ Collingwood was a long-established brazier and the son of a Master of the Armourers' Company: he was apprenticed in 1668 and was Master of the Armourers' Company himself in 1676. In 1679 Collingwood was recorded as a brazier of St Olave parish, Southwark. His taking of two apprentices from Wandsworth families in 1689 and 1693 suggests that it was in the 1680s that he converted part of the Upper Mills for copper working.⁵²

It may be relevant here that Sir Clement Clerke leased a mansion in the neighbouring parish of Putney in 1685. Clerke was the key figure in devising ways of smelting copper with coal instead of charcoal, which was what eventually enabled England to compete against the dominant Swedish copper industry. He was producing some saleable copper in or near London in 1688. Could some of his experiments and production have taken place at Collingwood's mill in Wandsworth? Sir Clement's son, Sir Talbot Clerke, who had assisted in his father's experiments, subsequently occupied the same house at Putney.⁵³

After Collingwood's death in about 1705, the copper mill passed to the following:

- 1 Thomas Dring, of Allhallows the Great, citizen and armourer of London, Collingwood's son-in-law and former apprentice. He had been Master of the Armourers' Company in 1697. In 1704 the mill was apparently jointly owned by Dring and Hatch and was occupied by John Slapp. Dring died in 1712.
- 2 William Carpenter, of Allhallows the Great, citizen, armourer and brazier of London, Thomas Dring's nephew and former apprentice. He seems to have had only a half-share in the copper mill. He died in 1719.
- 3 Richard Willis, of Thames Street, London, coppersmith, who married William Carpenter's widow, Deborah. Willis, too, seems to have had only a half-share in the copper mill, paying half of the £45 a year rent for that part of the mill. He died in 1738.
- 4 John Applebee & Co, who insured the copper mill against fire in 1733 and 1740. Probably they shared the copper mill with Willis. John and Charles Applebee were Master of the Armourers' and Brasiers' Company in 1734 and 1740 respectively.⁵⁴

⁵⁰ TNA: PROB 11/354, Henry Robinson; LMA: SKCS 42, pp 167, 169; Scott 1910, 2, 434; Pitt 1930, 42; TNA: PROB 11/532, James Robinson; Squire 1889, 303; TNA: C 11/1504/25; PROB 11/554, Nicholas Lesow.

⁵¹ TNA: PROB 11/486, Edward Collingwood; PROB 11/538, Thomas Dring, codicil; Gerhold & Ensing 1999, 16–19; Evans 2001, part A, no 33, part B, nos 606–7, section 2, no 157; McGow, no 45.

⁵² Webb 1998, 13, 16, 63; Pitt 1930, 42; TNA: C 6/233/60.

⁵³ SHC: 369/5, 24 September 1685, admission of Godfrey Woodward and Thomas Moore; LMA: first minute book of Martyn's charity, f. 3; Jenkins 1943–5, 74–5; Day 1973, 26.

⁵⁴ TNA: PROB 11/538, Thomas Dring; Webb 1998, 10, 17; Pitt 1930, 42–3; LMA: SKCS 42, pp 167, 169; TNA: PROB 11/486, Edward Collingwood; PROB 11/571, William Carpenter; C 11/255/23; PROB 11/690, Richard Willis; Evans 2001, part A, no 33. A John Applebee was Master of the Armourers' and Brasiers' Company in 1709, and John Applebee senior and junior established a copper mill at Taplow, Buckinghamshire, in 1718 (Pitt 1930, 43; TNA: C 11/997/9).

There is no suggestion that Collingwood or his successors were of foreign origin (despite Collingwood's wish to be buried in the Flemings' churchyard in Southwark), but foreign expertise does seem to have been drawn on. Adolphus Rachon, whose name suggests Swedish origin, was recorded in Wimbledon's parish register from 1672 to 1682, but in 1680 the Wandsworth register describes him as 'of ye Garrett' (ie the hamlet of Garratt), and in his will of 1699 he referred to himself as a coppersmith of Wandsworth.⁵⁵ Other evidence suggests a connection with the Upper Mill lasting for three generations of Rachons, ending at the latest with the death of the third Adolphus Rachon in 1745.⁵⁶

A dispute in Chancery over William Carpenter's will provides a detailed view of the business in 1719, demonstrating many similarities to Richard Wilks' enterprise.⁵⁷ The heart of the business was in Thames Street in the City of London, where Carpenter lived in some style in a four-storey house containing fine furniture such as an oval table and cane chairs, together with china, plate, pictures, books and silver watches. Also in Thames Street were a forge and thirteen copper furnaces, as well as copper bars and plate and items such as kettles, stew pans, drink pots, boiling pots, saucepans, watering pots, frying pans and candlesticks. The equipment and stock in Thames Street were valued at £825, compared with only £149 for items at the Wandsworth mill and £127 for the household goods. The Wandsworth goods were described as follows:

Copper & copper shruffe charcoal & sea coal four wrought hammers one anvill & three husks one cast anvill & six peices iron hoopes on the mill shaft three pair of shears bare irons & large tongs barr iron belonging to the two forges & in the mill sledge hammers & tales [?] cast iron weights & leade weights one beam & scales with iron chaines melting forging & hand bellows four pair, pickle dust a water engine loose iron & other lumber the half part thereof belong to the late William Carpenter & amount to £149.6s.6d.

The premises therefore contained four hammers, two forges and three pairs of shears, and probably operated in a similar way to Adkins Mill. A Swedish visitor in 1725 wrote the following description of the copper mills at Wandsworth and Carshalton:

To each of these mills belongs a forge to melt the refined copper, 2 hammers to hammer it out and one deep-hammer, and a pair of scissors to cut the plates. The charcoals they also get from Sussex, which is said to cost 20 pence per sack of 3 bushels, and after [ie according to] their statement there will commonly be used 1 load or 60 sacks to one ton of copper [...] At present they work mostly English copper, among which they reckon for the best the one which comes from Redbrook mill in Wales [established c 1691] and is marked with a crown. Of Swedish copper now a little or nothing at all is imported, and they had found it of several kinds and unequal quality. At these mills are especially made bottoms, plates and staffs or negros to the Guinea-coast.⁵⁸

'Staffs', 'of which are made a great number', were evidently traded for slaves in Guinea in Africa as part of the 'triangular trade' between England, Africa and America.

Wandsworth may briefly have had a third copper mill. In 1698 the occupants of the Lower Mill in The Causeway (where the electricity sub-station now stands) were Nicholas Lesow,

⁵⁵ Clarke 1924, 24, 27; Squire 1889, 102; TNA: PROB 11/463, Adolphus Rachon.

⁵⁶ The first Adolphus Rachon was associated with Collingwood and Dring in the 1680s; debts due from William Carpenter in 1719 included nearly £12 to 'Mr Rachon'; Adolphus and John Rachon made an inventory of the copper mill in the same year; John Rachon (son of Ralph Rachon of Wandsworth, copper forger) was apprenticed to Richard Willis in 1727; John Rachon witnessed Willis's will in 1738 (TNA: C 10/384/14a; C 11/255/23; Webb 1998, 46; TNA: PROB 11/690, Richard Willis; Squire 1889, 393).

⁵⁷ TNA: C 11/255/23.

⁵⁸ LUL: MS 7.1 (23), p 43.

coppersmith, and William Chinnell, miller.⁵⁹ However, there is no other evidence of copper working there (in fact no other evidence at all of its use between 1669 and 1723), and by 1723 the Lower Mill was an oil mill.

By the 1690s copper mills were beginning to be established elsewhere on the Wandle, as well as in and around Esher,⁶⁰ no doubt encouraged by the ending of what remained of the Mineral and Battery Works monopoly in 1689 and the development of copper smelting in England, especially at Redbrook. The first elsewhere on the Wandle was probably Tower copper mills at Mitcham by 1698, producing blanks for coinage.⁶¹ By 1704, as indicated earlier, the former iron mill in Wimbledon parish seems to have become a copper mill. Its five partners in 1712 included James Robinson, John Essington and William Carpenter.⁶² According to the Swedish visitor in 1725, there were then seven copper mills on the Wandle: one at Merton and two each at Mitcham, Carshalton and Wandsworth, though he seems to have conflated mills at Wandsworth and Wimbledon, since one of the Wandsworth mills was described as belonging to the English Copper Company, which then ran the former iron mill in Wimbledon.⁶³

Some of the Wandle's copper mills were short-lived, and few lasted much beyond the middle of the 18th century. The Wandsworth mills were among those that closed. Nothing more is heard of copper working at Upper Mills after 1740. As for Adkins Mill, when Henry Robinson of Wandsworth died in 1762, he left much of his property to his great-nephew, Henry Robinson. There were legacies to Thomas Bartlett, recorded as a coppersmith of Wandsworth (aged 23) in 1763, and to William Walters, master workman at the Wimbledon mills. The great-nephew lived elsewhere, and in 1771 his part of the Wimbledon mill was occupied by the Governor and Company of Copper Miners in England, while the Wandsworth mill was run by Thomas Bartlett, described in 1776 as copper forger and mill manager. In July 1777 the Wandsworth mill was sold to James Henckell, an iron forger, who converted it to an iron mill.⁶⁴ It has been argued that copper mills in the London area were generally small and had relatively high costs for labour and coal, so that it was found cheaper to work copper elsewhere.⁶⁵ Nevertheless, the continuance of two of the Wandle copper mills until the late 19th century indicates that copper working remained viable on the Wandle, perhaps for the more consumer-oriented products, and Adkins Mill may have ceased to work copper in 1777 mainly because someone wanted the site for a different purpose. In contrast, Merton copper mill continued until about 1870 and the Wimbledon copper mill until 1891, when copper working on the Wandle finally ended after more than 200 years.⁶⁶

Gunpowder

Gunpowder manufacture at Wandsworth began in 1656, when James Lloyd and Abel Richardson built what were described as four gunpowder mills, straddling the boundary between Wandsworth and Wimbledon (at the end of what is now Trewint Street, near Earlsfield Station).⁶⁷ Gunpowder consisted of about 75% saltpetre, 15% charcoal and 10% sulphur, and this mixture had to be forcibly compressed in a mill, which was done by water-powered pestles in a trough. The saltpetre (partly imported) and probably the sulphur (all

⁵⁹ SHC: 52/2/1. Nicholas Lesow junior married Margaret Chinnell.

⁶⁰ Day 1973, 27–8; Day & Tylecote 1991, 168–9.

⁶¹ Montague 1999, 10.

⁶² Scott 1910, 2, 434.

⁶³ LUL: MS 7.1 (23), pp 41–2; McGow, no 37.

⁶⁴ Squire 1887, 303; WHerS: MS list of Wandsworth marriages outside Wandsworth, p 0015; SHC: K 72/9; NRO: SOX 211, paper on Henckell's mills.

⁶⁵ Day & Tylecote 1991, 148.

⁶⁶ Montague 1999, 9; *Wimbledon News*, 19 January 1973, The Copper Mill.

⁶⁷ This section draws on the more detailed account in Gerhold 2002, where fuller references are given. See also Crocker *et al* 2000, 36–71.

imported) were brought by boat to Wandsworth. Richardson, with a one-third share in the mills, had been an unsuccessful gunpowder maker at Carshalton, whereas Lloyd, with two-thirds, seems to have had no previous experience of gunpowder manufacture. Richardson died in 1658. In 1661, Lloyd added two more mills upstream from the others in Wimbledon parish; their exact sites are unknown. This resulted in a dispute with Edward Barker, who claimed that his iron mills were in the backwater of the new mills, but Lloyd was protected from lawsuits by the Privy Council, which needed the gunpowder.⁶⁸ Apart from the proximity to Barker's mills, these were good sites for gunpowder manufacture, as they were far from any dwellings. In 1665 Lloyd was the second most important supplier of gunpowder to the Ordnance Office (after Josias Dewy of Carshalton), and in 1668 he stated that he had four waterwheels and six mills, capable of producing 70 barrels of gunpowder per week.⁶⁹

The Ordnance Office was not the only customer for gunpowder, but demand for gunpowder nevertheless fluctuated greatly with the alternation of peace and war, and by 1668, following peace with the Dutch in 1667, Lloyd was in financial difficulties. The next manufacturer at Wandsworth was William Buckler from 1672 until his death in 1678. Buckler was already a gunpowder manufacturer at Faversham and Bedfont, and subsequently acquired mills at East Molesey, but the Wandsworth site was his most valuable one. It consisted of five mills in 1678, each with four troughs, and the mills were still in two groups, with a watchhouse for each group. The northern group consisted of North Mead Mill on the west side, Peasecroft Mill on the east side and Goodship Mill between them. There were also a boiling house (where saltpetre was refined in a copper boiler), a mealing house (perhaps where ingredients were ground and mixed), a corning house (where, after the water-powered pounding of the ingredients in troughs, lumps of powder were broken down into grains, producing cornpowder), a dusting house (where loose dust was removed from the corned powder), a cooper's house (for producing barrels), a carpenter's house, a coal house, a dwelling, a stable with twelve horses and a storehouse by the Thames in Wandsworth. The Wandsworth mills were valued at £2527, compared with £1859 for East Molesey and £1185 for Faversham.⁷⁰

Buckler's widow Elizabeth left the management of the Wandsworth and East Molesey mills to her brother Peter Rich, a London Alderman and timber merchant. A survey of 1687 records Wandsworth as again the second most important supplier of gunpowder to the Ordnance Office (12% of the total), this time after the major site at Chilworth (37%).⁷¹ On Rich's death in 1692 the Wandsworth mills were sold to John De Berdt, a London merchant of Dutch origin, for £1900 plus a £50 annuity to Elizabeth Buckler. On De Berdt's death in 1702 they passed to his son, also John De Berdt, until he too died in 1709. This period saw the one recorded explosion, in 1703, when one of the mills blew up and several men were killed. There was also technical change: by 1709 stone edge runners (millstones running vertically on a bedstone) had replaced troughs and pestles.⁷²

Like most of his predecessors at the mills De Berdt junior died in debt. His widow Susannah continued to supply the Ordnance Office until 1713, but the long period of peace after the War of the Spanish Succession, which ended in that year, seems to have brought an end to gunpowder manufacture at Wandsworth, and the mills apparently lay empty. By 1724 at least one of them was 'decayed and useless'. Melancton Strong, a snuff dealer, took possession of the site in 1727 and built a new 'double mill' and another new mill, using them for grinding snuff and crushing oilseed, and crushing oilseed was thereafter the main or only function of the mills until at least 1853. The gunpowder houses by the Thames, which had existed by

⁶⁸ TNA: E 112/521, no 144; PROB 11/284, Abel Richardson.

⁶⁹ Tomlinson 1979, 115n; TNA: WO 55/1756.

⁷⁰ Gerhold 2002, 177–8; TNA: C 10/348/20.

⁷¹ TNA: C 10/348/20; WO 49/220.

⁷² Gerhold 2002, 179–81.

1693 or earlier and were presumably used for storage or for gunpowder in transit, remained in use for gunpowder manufactured elsewhere until at least 1838.⁷³

Dyeing

Dyeing was another of Wandsworth's new industries in the 1650s, and was the only Wandle industry that seems (at least in the 17th century) to have been carried out at Wandsworth alone. Little has been written about the dyeing industry and the other textile finishing trades, despite the fact that more than half the value of cloth – England's main industry – was in the finishing.⁷⁴ The Wandle's water is often assumed to have been dirty, on the basis of Aubrey's reference to 'the Sink of the Country', but what Aubrey actually wrote was that Wandsworth's bridge (over the Wandle), not the Wandle itself, was the sink of the country.⁷⁵ Evidently he meant that the bridge was expensive to maintain and was therefore where the country's (ie county's) money was sunk. If the water had been dirty, there could not have been any dyeing or bleaching works along the Wandle, though like any shared resource the clean water had to be defended against abuses and nuisances such as the 'filth mud and dirt' being washed into the river from a nearby road in 1743.⁷⁶

The Middle Mill was used in the first half of the 16th century to grind a red dye from brazil wood, and two dyers held property at Wandsworth in the 1550s,⁷⁷ but even if dyeing took place at Wandsworth then it does not seem to have continued, and the specific type of dyeing practised at Wandsworth in the 17th century was a skill newly brought by foreigners (though the technique was apparently developed by a Dutchman in London earlier in the century).⁷⁸

Its first practitioner at Wandsworth seems to have been Nicholas Pluyme, who is first recorded in the parish register in 1651. Pluyme was not just a dyer but a 'scarlet dyer',⁷⁹ and this was the Wandsworth speciality. Scarlet was the brightest and most difficult colour to create. To make the best-quality red dyes the scarlet dyers used cochineal. This was derived from a small insect that lived on the nopal plant in Mexico and was exported from Vera Cruz and then through Havana and Cadiz or Seville. Cochineal had been exploited by Europeans only since the 1540s, and for nearly two centuries no Europeans except the Spaniards, who monopolised it, even knew whether it came from an insect or a plant. It could cost up to £2 per lb, and the cost of dyeing wool with cochineal could exceed that of the unfinished cloth. Success for the dyer depended on the choice of cochineal, the water used for dyeing and the preparation of the acid solution.⁸⁰

Judging by his placing in the 1665 hearth tax list, Pluyme's dye works was north of the High Street,⁸¹ and was probably the site later used for dyeing on the east side of the Wandle (until recently forming part of the Ram Brewery). Pluyme apparently also had premises in London, as he was said to have been bankrupted by losses in the Great Fire.⁸² His foreign origin is indicated mainly by his foreign-sounding name, but also by his association with Frenchmen such as Nicholas Lichere, a merchant of London and Wandsworth, for whom he was dyeing stockings in 1675.⁸³ His possessions were seized for the benefit of his creditors

⁷³ Gerhold 2002, 181–2.

⁷⁴ Holderness 1976, 89–90; Fairlie 1964–5, 489.

⁷⁵ Aubrey 1719, I, 14.

⁷⁶ WHerS: Wandsworth vestry minutes 1709–44, p 481. In this case it is recorded that the dirt was previously discharged elsewhere to prevent injury to local businesses and the surveyors were ordered to consider possible remedies.

⁷⁷ Gerhold & Ensing 1999, 17; TNA: LR 2/190, ff 11–25.

⁷⁸ Greenfield 2005, 176–82.

⁷⁹ Squire 1889, 71; TNA: C 24/920, Lesheire *v* Paravicine; C 5/539/14.

⁸⁰ Hellot 1901, 101, 102, 105; Greenfield 2006, 53–6, 94, 100, 208–10; Fairlie 1964–5, 489.

⁸¹ TNA: E 179/188/489A.

⁸² TNA: C 6/183/75.

⁸³ TNA: C 5/539/14; C 7/493/74.

a few days before his death in 1675.⁸⁴ The dyehouse is next recorded in 1724, but thereafter can be traced continuously until the late 1820s.⁸⁵

The second scarlet dyer recorded at Wandsworth was Abraham Hebert in 1654. Hebert was at least once described as a Dutchman, but was in fact from Dieppe in France.⁸⁶ His works were on the east side of the Wandle between the Upper Mill and Adkins Mill.⁸⁷ In 1672 he was prosecuted for flinging 'his filthy dyinge stuffe' into the Wandle – a sign that the purity of the Wandle water had to be defended.⁸⁸ Hebert died in 1682, and his executor's accounts, which survive as part of a Chancery suit, provide a picture of the business. Numerous debts were owed by London merchants for dyeing, especially of serges, which were brought to London from the West Country, and stockings. The firm also traded in serges on its own account (one William Hebert was based at Exeter, where they came from). Serges were tentered in a field just across the Wandle. At least two journeyman dyers were employed, and other expenses included cochineal, starch and barrels of cream of tartar, used as a fixative. The equipment was valued at £685. Hebert had a house in St Helen's Bishopsgate parish in the City.⁸⁹ The inventory of Hebert's widow, Katherine, of 1684 indicates considerable prosperity, with a total value of £1809, including £104 of plate, £182 of gold and gold rings and £550 of cochineal at 20s per pound (held as security for a loan).⁹⁰

Hebert left the dyehouse and equipment to his granddaughter Susan, but his grandson Abraham Gosselin was to have the use of 'the dyehouse kettles tenters and appurtenances' for ten years for £60 a year. Gosselin's family was from Caen in Normandy. The dyehouse seems subsequently to have been run by Matthew Hebert (from Dieppe), described as a merchant of London in Abraham Hebert's will, but as a scarlet dyer of Wandsworth in Katherine Hebert's will (he was undoubtedly both). He died in 1703, leaving his dyeing equipment to his wife Mary and son Abraham, who were jointly declared bankrupt in 1705, bringing to an end the Heberts' involvement in scarlet dyeing in Wandsworth.⁹¹ Subsequently the dyehouse belonged successively to William Kirby, Joost Krull, William Snelling and Everard Fawkner (the latter being Voltaire's host during his residence in Wandsworth from 1726 to 1728), and then members of the Williamson family from the 1730s.⁹²

Another dyeworks, not recorded until 1670 and not located, belonged to Christian Loat or Loot, senior and junior. Loat senior was a thread dyer and did not know the secret of scarlet dyeing. Loat junior 'by travelling abroad & by being in other dye houses in the nature of a servant or journey man & by such educacon as his father had given him, had arrived to a secret knowledge in the art of makeing the bow dye colour or scarlett colour'. For this reason his father took him into partnership in 1679, with a joint stock of £300 entirely supplied by the father, on condition that the son taught the father the mystery of scarlet dyeing within one month and that the father did not share the secret with anyone else except his other son Lewis. Nevertheless, by 1681 Loat junior had still not imparted the secret to his father. On his deathbed in that year, he ordered the handing over of 'a writing of great concern and moment containing full and ample directions how to make the scarlet dye'. Loat senior's inventory of 1684 lists his three kettles (£86), four tenters (£40), cochineal, fixatives such as cream of tartar and argol, and coppers (vitriol).⁹³

⁸⁴ TNA: PROB 4/14939.

⁸⁵ McGow, no 47.

⁸⁶ Squire 1889, 10; LPL: Ece 1, f 491, evidence of John Wright; Shaw 1911, 88.

⁸⁷ TNA: E 179/188/489A.

⁸⁸ SHC: transcript of Quarter Sessions, 1671–2, p 307.

⁸⁹ TNA: C 5/164/81.

⁹⁰ TNA: PROB 5/2021.

⁹¹ TNA: C 5/164/81; Shaw 1911, 104, 111; TNA: E 112/745, no 45; PROB 11/370, Abraham Hebert; PROB 11/378, Catherine Hebert; PROB 11/471, Matthew Hebert; McGow, no 44.

⁹² NRO: Spencer papers, 7d1, Wandsworth freehold rental, Thomas Williamson; TNA: PROB 11/665, Joost Krull.

⁹³ TNA: C 8/281/52; C 6/249/52; PROB 5/2027. For the meaning of 'bow dye' see Greenfield 2006, 179–82.

Other dyeworks included one between the Wandle and Garratt Lane closer to the High Street than Hebert's, recorded at least from 1740 to 1754, and one in the south of the parish on the east side of Copper Mill Lane, recorded from 1726 to 1786.⁹⁴ Wandsworth's dyers such as the Barchards and Williamsons continued even in the 1820s to be referred to as scarlet dyers.⁹⁵ Dyeing declined and disappeared from Wandsworth well before the first chemical dye was developed, probably because it became advantageous to dye near the place of manufacture. Pluyme's dyeworks were last held by the Barchard family and closed in the late 1820s, and Hebert's were held by the Williamson family until 1831, when the dyeing equipment was sold and dyeing in Wandsworth came to an end.⁹⁶

Bleaching

Bleaching began in Wandsworth in 1657. On 11 April of that year Richard Pillett leased 11 acres beside the Wandle south of Adkins Mill, for £16 a year. He converted part of it into a whiting ground and built there a dwelling for himself, consisting of parlour, kitchen, buttery, brewhouse, three chambers and two garretts.⁹⁷ Bleaching was long-established elsewhere on the Wandle, having been introduced by Dutchmen in Mitcham, probably as early as the 1590s.⁹⁸ Imported cotton cloth needed whitening before it could be dyed or patterned, and it was the Dutch who developed this trade. There is no reason to assume a foreign origin for Pillett, but in 1660 he sub-leased 4 acres at the south end of his holding to Francis and Walgrave Lodwick, merchants of Flemish origin, for reasons which are not recorded but may have been for the same purpose of bleaching cloth.⁹⁹

Bleaching was a long process, taking seven or eight months, and depended on the sun's rays rather than chemicals. There was a cycle of 'bucking' (covering the cloth in a vat with hot water mixed with lye) and crofting or grassing (laying the cloth on the grass for wetting and drying), which was done ten to sixteen times. This was followed by souring with buttermilk and working with bare feet, and finally soaping. Grassing required clean water and sun, and gave rise to a distinctive pattern of parallel water channels, from which water was scooped up to drench the cloths.¹⁰⁰ The expense of creating the water channels meant there was strong continuity in bleaching sites. Pillett's inventory of 1673 records his bucking house and beating house, including 'one marble stone to smooth clothes on'. There were also 'three cabbins and cabbins beds', presumably for workers watching over the valuable cloth, and the need to prevent theft was probably also why Pillett was keeping a 'savage great dog' without a muzzle in 1670 (for which he was prosecuted).¹⁰¹ One of Pillett's daughters later stated that he had earned £570 by his trade in 1673. Pillett died in that year, in his will requesting his wife to carry on 'my trade of whiteing lynneth cloth'. The site was still held by his family in 1691.¹⁰²

Wandsworth's second bleaching site was south of the High Street adjoining a sidewater of the Wandle (fig 4). It is first recorded in 1687, when John Owsley, whitster, leased it, but it already then included 'the whiting house' and a whiting ground. The occupier in 1708 was Griffith Jones, who was related to the Owsleys. On his death in that year he left his whiting trade to his wife and his nephew Robert Evans, taking particular care over the disposition

⁹⁴ Evans 2001, part B, nos 135, 402–3, part C, nos 108, 227.

⁹⁵ Pigot 1826–7.

⁹⁶ McGow, nos 44, 47.

⁹⁷ LPL: E10/20, G40/2/1; TNA: C 5/538/81.

⁹⁸ Montague 1992, 5–6.

⁹⁹ TNA: C 5/538/81; LPL: Ee7, f. 84; *ODNB*: Francis Lodwick.

¹⁰⁰ Higgins 1924, 9–10; Turnbull 1951, 3.

¹⁰¹ LPL: G40/2/1; SHC: transcript of Quarter Sessions, 1669–70, p 207.

¹⁰² LPL: Ee7, f. 85; TNA: PROB 11/343, Richard Pillett; LPL: E10/21.

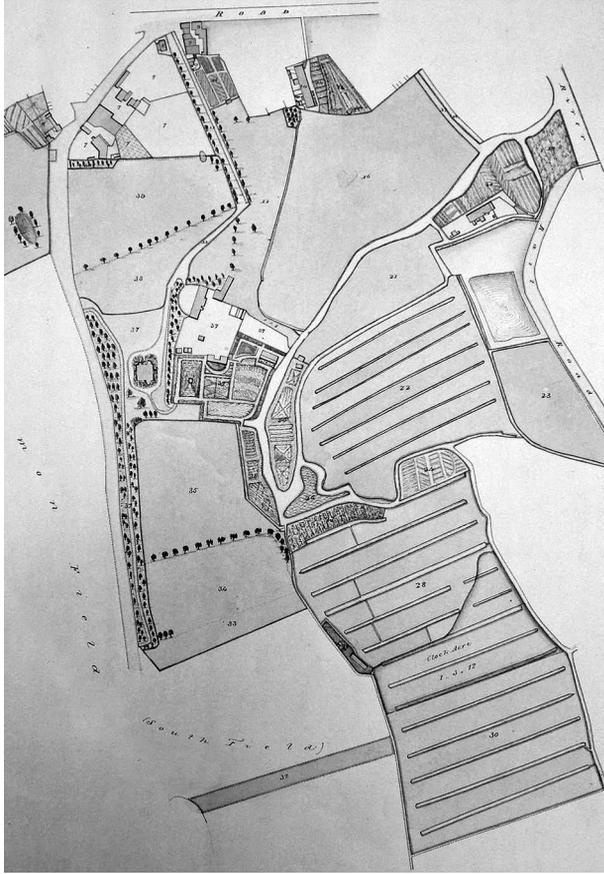


Fig 4 Plan of the estate of Henry Gardiner, 1828, showing the channels from which water was scooped over the cloth during the bleaching process. The area shown is south of Wandsworth High Street between Merton Road and the Wandle. The bleaching works established (or taken over) by John Owsley in 1687 was between Merton Road on the left and the sidewater of the Wandle in the centre, where buildings and gardens are shown. The later calico printing works of Henry Gardiner is in the top right-hand corner. (BL: Add 78154, S)

of his 'great copper'.¹⁰³ In 1701 various Wandsworth mill-owners cited 'the extravagancy of whitsters' as one of the reasons for water shortages.¹⁰⁴

The replacement of buttermilk by sulphuric acid from the 1750s halved the time taken for bleaching to about four months, and the use of chlorine from the 1780s reduced it further to a few days and made it an indoor process.¹⁰⁵ Bleaching was increasingly carried out in the cotton-manufacturing areas, notably Lancashire and Scotland. By then Pillett's and Owsley's bleaching sites had long since become part of calico printing enterprises, which are discussed next.

Calico printing

By the 1660s the new industries had left their mark on Wandsworth's employment and social structures. In the 1670s, in addition to the 8% of male workers employed in corn milling,

¹⁰³ NRO: SOX 277, Corlop etc to Ousley, Hewett to Ousley; TNA: PROB 11/501, Griffith Jones.

¹⁰⁴ LMA: SKCS 42, p 89.

¹⁰⁵ Higgins 1924, 62–3, 73–5, 94, 107.

10% were employed in industry, to which should be added most of the 5% who were described only as Dutchmen or Frenchmen.¹⁰⁶ In 1663 Wandsworth's fifteen vestry members included, beside the vicar and one of the lords of the manor, Edward Barker, iron merchant; Abraham Hebert, dyer; Francis Lodwick, merchant; George Street, miller; Edmund Crisp, brewer and Richard Pillett, whitster.¹⁰⁷ Thus, when French Protestant refugees (or Huguenots) began to settle in Wandsworth in the 1680s, following the decision by Louis XIV that there should no longer be toleration for Protestants in France, they came to a place which already had numerous industries, some of them founded by French-speakers. Indeed the fact that French-speakers were already numerous in Wandsworth must have been an important reason for many of the refugees choosing Wandsworth. Their petition of about 1682, requesting permission to build a church at Wandsworth, recalled that they had already established several manufactures there, and the signatories to the petition included Abraham Hebert the dyer.¹⁰⁸

The most important new industry of the 1680s was calico printing, though not all of those who engaged in it were French. Unlike many of the other industries it was a major employer. Calico printers printed patterns on cotton or fustian, using wooden blocks or, later, metal plates. Power was not needed until rollers began to be used in the 1780s. The process started with bleaching, and the bleaching grounds generally became the sites of calico printing, as happened to both of Wandsworth's bleaching grounds. There were printers at Richmond in about 1675 and Mitcham from about 1690, and in 1691 two calico printers with French names are recorded at Wandsworth: Jean Bergeret and Rowland Bouchet.¹⁰⁹ Peter Debuissou, who had been one of Abraham Hebert's journeymen in 1682, took out a patent relating to calico printing in 1715.¹¹⁰ In 1721 the two most important calico printers petitioning against a ban on the process were the Huguenot Peter Mauvillain (a merchant of London and Morden), who employed 250 at Wandsworth and Mitcham, and Watson, who employed 121 at three works including one at Wandsworth.¹¹¹ John Page, a calico printer at Wandsworth by 1729, had married the widow of Richard Pillett's son, and was probably then occupying Pillett's bleaching ground, as he had been doing in 1690.¹¹²

Pillett's premises (probably including the part he had leased out to the Lodwicks) continued as two calico printing enterprises into the 19th century.¹¹³ Owsley's bleaching ground was eventually to become the most important calico printing enterprise in Wandsworth, though by then the works had been transferred to a new site slightly further east (fig 4). It passed successively to Mary Jones and Thomas Lattimore, Richard Butcher and Edward Wells, Richard Marsh (1739), David Asterley (1744), Benjamin Asterley (1761) and Henry Gardiner (by 1774). In 1792 it employed 250 workers, as many as all Wandsworth's other industries together. Insurance policies from 1780 to 1815 list warehouse, stables, cart house, printing shop, pencilling shop, glazing shop 'with drawing rooms over', mill house, dye house, blue dye house and copper plate shop with measuring loft.¹¹⁴ Two other bleaching grounds developed later: one straddling the boundary between Wandsworth and Wimbledon, first recorded in 1776 and later known as Garratt Print Works, and one at Duntshill Mills, created in about 1780.¹¹⁵

Not only must bleaching on the Wandle have declined rapidly after the use of chlorine began in the 1780s, but the development of cylinder or roller printing from 1785 meant that

¹⁰⁶ Gerhold 1998, 22 (based on information in Squire 1889).

¹⁰⁷ LPL: E2/65; Ec2, ff. 200–4.

¹⁰⁸ Bod: Rawl C984, f. 258.

¹⁰⁹ Turnbull 1951, 18; WHerS: MS list of Wandsworth marriages outside Wandsworth, p 10.

¹¹⁰ TNA: C 5/164/81; Squire 1887, 238.

¹¹¹ Turnbull 1951, 21; Montague 1992, 40; TNA: PROB 11/704, Peter Mauvillain.

¹¹² LPL: G40/2/1.

¹¹³ McGow, nos 41, 42.

¹¹⁴ NRO: SOX 277; McGow, no 46; Lysons 1792, 1, 503; Evans 2001, Part C, nos 394–7.

¹¹⁵ *WTM*, 62; McGow, nos 38, 40.

steam-power was needed and therefore cheap coal. The London area also had the problem of relatively high wages. The production of printed textiles expanded massively in the north and declined in the Wandle valley.¹¹⁶ Gardiner's works closed in 1816, and the two works on the Pillett site closed in 1812 and 1834. As elsewhere in the Wandle valley, only the more specialised artwork catering for the luxury trades survived. Shawl printing continued at Duntshill until at least 1866 and Garratt Print Works survived until 1895.¹¹⁷

Hatmaking

The other important Huguenot industry was hatmaking. Fine hats had been made at Caudebec and the surrounding area in Normandy exclusively by Protestants, who had a secret way of preparing rabbit, hare and beaver skins. Huguenots brought the secret with them to Wandsworth.¹¹⁸ Following complaints from the Feltmakers' Company of London against French hatmakers at Wandsworth and elsewhere, the Privy Council licensed five of them in 1685, 'provided they take not above two apprentices apiece and those English unlesse their owne sons, and that they imploy no forreiners but such French Protestants as are now in England, and provided they imploy two English men for every Frenchman they shall make use of. Others were granted licences subsequently on condition that they did not make hats within 5 miles of London (Wandsworth was just outside that limit). One petitioner was Magdalene Le Fort in 1686, who stated that her husband Peter was given 'leave to worke, or cause to worke, in the new manufactures of hatts at Wandsworth which were formerly imported from France, praying in regard her said husband is dead & left her poor & desolate, & that she hath been brought up since her youth in dressing of hatts she may have leave to continue the exercising of that trade'. David Barband (probably the Monsieur Barbeau recorded at Wandsworth) stated in his petition of 1686 that many French hatters could be useful 'were they not molested by the natives of ye same trade, and by reason of their poverty, [are] unable to set up & carry on their worke', and offered to provide a stock and set 'the said distressed hatmakers' to work; this was agreed.¹¹⁹

The French hatmakers did not have an easy time at first. Gamaliel Martin, though licensed to make hats at Wandsworth, was so threatened by the English hatters that he had fled abroad by February 1687, and in 1690 even the licensed hatmakers were still fending off lawsuits and arrests.¹²⁰ A 19th century story that the cardinals in Rome obtained their caps from the French Protestants in Wandsworth cannot be substantiated, but may nevertheless have been true, given the expertise in Wandsworth in hatmaking and scarlet dyeing. It would nicely complement the fact that Protestant dyers at Wandsworth obtained the cochineal vital to their trade from Catholic Spain. The hatmakers' secret was apparently taken back to France in the middle of the 18th century, but Lysons noted in 1792 that 'Though much diminished in its extent, the manufacture [of hats] still exists; Mr Chatting, a grandson of one of the refugees, being now a hatter at Wandsworth'.¹²¹

Leather

Another Huguenot industry, apparently new to Wandsworth, was leather. Skinning, tanning and dressing were all carried out at Wandsworth in the late 17th and early 18th centuries. Josias Senne, one of the petitioners of about 1682, was a leather-dresser in 1687, Isaac Colon had a tanyard in the grounds of Downe Manor House in 1705 and part of the Upper Mills

¹¹⁶ Higgins 1924, 73, 94, 107; Turnbull 1951, 50; Montague 1992, 30–1.

¹¹⁷ McGow, nos 38, 40–2, 46; Montague 1992, 36.

¹¹⁸ Weiss 1853, I, 38, II, 333.

¹¹⁹ TNA: PC 2/71, pp 11, 67, 199, 279, 303–4, 321, 417; PC 2/72, pp 436, 517, 610, 612, 703.

¹²⁰ TNA: PC 2/71, pp 397, 405; PC 2/73, p 415.

¹²¹ Weiss 1853, 2, 334; Lysons 1792, I, 503.

was a skinning mill run by Jacob and Michael Papineau from the 1720s. The skinning mill apparently continued until the 1760s, but otherwise leather was a relatively short-lived industry in Wandsworth.¹²² Of silk weaving, another industry often said to have been introduced into Wandsworth by Huguenots, there is almost no evidence at all.¹²³

Later developments

In the 18th century Wandsworth lost its frying pan, copper, gunpowder and leather industries, but regained iron manufacture (at Adkins Mill from 1777 to about 1832) and gained oil pressing, which began at the Lower Mill and Garratt Mill between 1723 and 1727, and also malting, distilling and chemicals.¹²⁴ The last of these was linked to the cloth finishing trades: Gatty and Waller's firm, which took over the frying pan site in 1771, was described in 1814 as preparing iron liquids and sours or acids for the calico printers.¹²⁵ There continued to be corn milling and brewing. In the 18th century Wandsworth had as great a range of industries as any parish in the country and it is not surprising that the Wandle valley became the site of a pioneering railway, the Surrey Iron Railway, in 1802.

In the 19th century the traditional Wandle industries declined. There had long been a turnover of industries, with some disappearing for reasons such as technical change (bleaching) or market conditions (gunpowder), and there continued to be significant new arrivals, such as papermaking in 1836. However, the relatively high wages near London needed to be offset by countervailing advantages, and the advantages conferred by the Wandle gradually diminished. Water extraction and pollution reduced the flow and purity of the water, and increasing use of coal for power made waterpower less valuable. Several of the mills acquired steam engines, starting with Adkins Mill in 1813,¹²⁶ but being close to a navigable river, the Thames, was not as good as being on a coalfield. Wandsworth remained an important industrial area, but as industrial areas both Wandsworth and the Wandle valley as a whole lost much of their distinctiveness. The last use of water power in Wandsworth was probably at the Royal Paper Mills (formerly Adkins Mill) in 1906.¹²⁷

Conclusion

The story of Wandsworth's 17th century industries is important for several reasons. First, it highlights the crucial role of foreign workers in bringing new skills to England. All Wandsworth's new industries except gunpowder, bleaching and possibly copper (at least in 1654) depended directly on them, and even bleaching had first been brought to the Wandle valley by a foreigner. Secondly, it demonstrates the importance of London's environs as a source of power and clean water for industrial processes that could not easily be carried on in the city or its immediate suburbs. Sometimes activities in Wandsworth served much larger enterprises in London itself, as in the case of the two copper mills. Thirdly, it highlights the role of Londoners and the London market in promoting new industries and technologies, some of which later migrated to other parts of the country, and in some cases supplanted imports or contributed to the growing range of consumer goods. More systematic research is needed into the industrial development of the environs of London, for the 17th century in

¹²² LA: deed 5753; NRO: SOX 277, Howland to Forrester; McGow, no 45.

¹²³ The will of Abraham De La Nenfue Maison, silk weaver of Wandsworth, was proved in 1714, but is not proof that he practised silk-weaving at Wandsworth, as opposed to having a residence in Wandsworth (TNA: PROB 11/541).

¹²⁴ Above; Gerhold 1998, 33, 37, 41, 45.

¹²⁵ NRO: SOX 252, Spencer to Gattey & Waller; Manning & Bray 1814, 3, 342.

¹²⁶ Gerhold 1998, 32.

¹²⁷ Fernández & Crocker 2003, 15. The Upper Mill was using waterpower to make 'water-gas' in 1898 (Davis 1898, 15), and continued operating until 1928.

particular. The example of Wandsworth, and especially the industries there that are known entirely or largely from legal proceedings, indicates how much more remains to be discovered.

ACKNOWLEDGEMENTS

Thanks are due to Prof Peter Edwards for helpful comments on an earlier draft of this paper and to Audrey Graham for redrawing figure 1 for publication.

BIBLIOGRAPHY

Manuscript sources

- BL: British Library
Add 78154, survey of Wandsworth 1706; plan of Henry Gardiner's estate 1828
- Bod: Bodleian Library
Rawl C984, f. 258 Petition from French Protestants of Wandsworth *c* 1682
- BM: British Museum
1919,0712.48 Prints and Drawings, A riverside warehouse at Wandsworth, by Grimm *c* 1770
- LA: Lambeth Archives
Deed 5753
VI, 258 Dunsford manor rental *c* 1665–91
- LMA: London Metropolitan Archives
SKCS Records of the Surrey and Kent Commissioners for Sewers
Minute book of Martyn's Charity, Putney, 1716–69, uncatalogued
- LPL: Lambeth Palace Library
Records of the Court of Arches
- LSA: Liège State Archive
Index of Jemeppe parish register
- LUL: Liverpool University Library
MS 7.1 (23) Translation from archives of Bergskollegium, Sweden, of H Kahlmeter's account of the English copper mines 1725
- NRO: Northamptonshire Record Office
Spencer papers (usually prefixed SOX)
- SHC: Surrey History Centre, Woking
52/2/1 Deed of 'Lome pitt mills' 1698
369/5 Court roll of Wimbleton manor, 1685–8
3991/1 Map of Allfarthing Manor, Wandsworth, 1633
G145/7 Book of extracts from Dunsford manor court rolls
K61/5/57 'Particular' of Allfarthing manor 1670
K72/9 Mortgage of Wimbleton copper mill 1771
Transcript of Surrey Quarter Sessions, 1669–72
- SRO: Somerset Record Office
DD/OB 103/1 Deeds of Bye Mill, Stanton Drew
- TNA: The National Archives
C Records of the Court of Chancery
E 112 Court of Exchequer bills and answers
E 133 Court of Exchequer depositions
E 179 Lay subsidy and hearth tax records
PC 2 Privy Council registers
PROB 4 Prerogative Court of Canterbury inventories
PROB 5 Prerogative Court of Canterbury inventories
PROB 11 Prerogative Court of Canterbury wills
WO 49/220 Ordnance Office papers
WO 55/1756 Ordnance Office papers
- WHerS: Wandsworth Heritage Service, Battersea
Wandsworth vestry minutes, 1709–44
MS list of Wandsworth marriages outside Wandsworth

Published and secondary sources

- Articles*, 1720: *Articles of agreement made* [20 July 1720] *between the Governor and Company of Copper-Miners in England* [and Chambers, Essington, Bradley and Billingsley, merchants] (British Library, 522 m.12, no 3)
- Aubrey, J, 1719 *The natural history and antiquities of the county of Surrey*, **1**, London: Edmund Curl
- Cartwright, J J (ed), 1889 *The travels through England of Dr Richard Pococke*, Camden Society, 2 ser, **44**
- Clarke, A W H (ed), 1924 *The parish register of Wimbledon, co. Surrey*, London: Mitchell Hughes & Clarke
- Crocker, A G, Crocker, G M, Gairlough, K R, & Wilks, M J, 2000 *Gunpowder mills: documents of the seventeenth and eighteenth centuries*, Surrey Rec Soc, **36**
- Davis, C T, 1898 *Industries of Wandsworth*, Wandsworth: privately published
- Day, J, 1973 *Bristol brass: a history of the industry*, Newton Abbot: David & Charles
- , & Tylecote, R F (eds), 1991 *The industrial revolution in metals*, London: Institute of Metals
- Donald, M B, 1961 *Elizabethan monopolies*, Edinburgh: Oliver & Boyd
- Douhan, B, 1985 *Arbete, kapital och migration: Valloninvandringen till Sverige under 1600-talet*, Sweden: University of Uppsala
- Edwards, P, 2000 *Dealing in death: the arms trade and the British civil wars, 1638–52*, London: Sutton Publishing Limited
- Evans, T, 2001 *Local and family history from fire insurance policies (for the 18th & 19th centuries); 1*, Wandsworth: Wandsworth Historical Society
- Fairlie, S, 1964–5 Dyestuffs in the eighteenth century, *Econ Hist Rev*, 2 ser, **17**, 488–510
- Fernández, J C, & Crocker, A, 2003 William McMurray or Don Guillermo: wireworker, papermaker, *espartero*, part 2, *The Quarterly: J Brit Assoc Pap Hist*, **48**
- Gerhold, D J, 1998 *Wandsworth past*, London: Historical Publications
- , 2002 Wandsworth's gunpowder mills, 1656–1713, *SyAC*, **89**, 171–83
- , 2009 The Hallen family, iron platers and frying pan makers, *Int J Hist Engineering Technology*, **79**, 34–58
- Gerhold, D J, & Ensing, R, 1999 Wandsworth's water mills to 1700, *The Wandsworth Historian*, **70**, Wandsworth Historical Society
- Giuseppi, M S, 1908 The river Wandle in 1610, *SyAC*, **21**, 170–91
- Greenfield, A B, 2006 *A perfect red*, London: Black Swan
- Hallen, A W C, 1885 *An account of the family of Hallen or Holland*, Edinburgh: privately printed
- Hellot, Jean, Macquer, —, & Le Pileur d'Apligny, —, 1901 *The art of dyeing wool, silk and cotton*, London: Scott, Greenwood & Co (first publ 1789)
- Higgins, S H, 1924 *A history of bleaching*, London: Longmans, Green
- Hildebrand, K-G, 1992 *Swedish iron in the seventeenth and eighteenth centuries*, Stockholm
- Holderness, B A, 1976 *Pre-industrial England: economy and society from 1500 to 1750*, London: J M Dent & Sons Ltd
- Holmes, C, 1974 *The Eastern Association in the English Civil War*, Cambridge: University Press
- Jenkins, R, 1943–5 Copper smelting in England: revival at the end of the seventeenth century, *Newcomen Soc Trans*, **24**, 73–80
- Lysons, D, 1792 *Environs of London*, **1**
- McGow, P *Mills of the Wandle*. <http://www.curator.pwp.blueyonder.co.uk/aboutus/mills/mcgow.htm> (Accessed 26 September 2005)
- Manning, O, & Bray, W, 1804–1814 *The history and antiquities of the county of Surrey*, 3 vols, London: J White
- Milward, R J, 1969 *Early Wimbledon*, Wimbledon: privately printed
- Montague, E N, 1992 *Textile bleaching and printing in Mitcham and Merton 1590–1870*, Merton: Merton Historical Society
- , 1999 *Copper milling on the Wandle, with particular reference to Merton and Mitcham*, Merton: Merton Historical Society
- Osborn, H, 1999 *Britain's oldest brewery: the story behind the success of Young's of Wandsworth*, Wandsworth: Young's
- ODNB: Oxford dictionary of national biography*, 2004, Oxford
- Pigot, 1826–7 *Pigot and Co's London & provincial new commercial directory, for 1826–7*, London
- Pitt, S H, 1930 *Some notes on the history of the Worshipful Company of Armourers and Brasiers*, London: privately printed
- Plot, R, 1686 *The natural history of Stafford-shire*, Oxford: The Theatre
- Post-Man* 31 January, 2 March 1708
- Proceedings: Proceedings of the Old Bailey*. <http://www.oldbaileyonline.org> (Accessed 13 August 2009)
- RFC: The registers of the French Church, Threadneedle Street, London*, **1**, Huguenot Soc, **9**, 1896
- Richardson, T, 2004 *The London armourers in the 17th century*, Leeds: Royal Armouries
- Roberts, H D, 1981 *Downhearth to bar grate*, Avebury: Wiltshire Folk Life Society
- Scott, W R, 1910 *The constitution and finance of English, Scottish and Irish joint-stock companies to 1720*, **2**, Cambridge: University Press
- Shaw, W A (ed), 1911 *Letters of denization and acts of naturalization for aliens in England and Ireland, 1603–1700*, Huguenot Society of London, **18**
- Squire, J T, 1887 *The Huguenots at Wandsworth in the county of Surrey and their burial ground at Mount Nod*, *Proc Huguenot Soc London*, **1**
- (ed), 1889 *The registers of the parish of Wandsworth [...] 1603–1787*, Lymington: C T King
- Tomlinson, H C, 1979 *Guns and government: the Ordnance Office under the later Stuarts*, London: Royal Historical Society
- Turnbull, G, 1951 *A history of the calico printing industry of Great Britain*, (S.n.)

- VCHM: Victoria history of the county of Middlesex*, **2**, W Page (ed), 1911, London: Oxford Univ Press for the Institute of Historical Research
- Webb, C (ed), 1998 *London livery company apprenticeship registers*, **22**; *Armourers' and Brasiers' Company c1610–1800*, London: Society of Genealogists
- Weiss, P C, 1853 *Histoire des réfugiés Protestantes de France*, **1**, Paris: (S.n.)
- Wimbledon News* 19 January 1973, The Copper Mill
- WVM: Wimbledon vestry minutes*, Surrey Rec Soc, **25**