

Drawing of main 1878 facade of Catteshall Mill.  
 Reproduced by arrangement with the artist, John L. Baker

## INTRODUCTION

Catteshall Mill on the River Wey at Godalming, Surrey provides a particularly rewarding study in both industrial archaeology and local history. Since the 11th century the site has been used for a variety of industrial activities including corn-milling, malting, fulling, paper-making, tanning, engineering and foundry work. During the early 20th century the property was called Farncombe Mills. It is now known as Catteshall Works and is still used for engineering and other activities. Until the mid-19th century the mill was powered by water-wheels but these were then replaced by steam-engines and a water-turbine. This turbine is the largest and best preserved example of its type known to survive in the country and one of the most significant industrial monuments of Surrey. The buildings also exhibit many other traces of past industrial activities, particularly paper-making and engineering. Another important feature of the mill is its position on the Godalming Navigation, formerly a convenient means of transportation for both raw materials and manufactured goods.

Documentary information about Catteshall Mill is remarkably extensive. This is partly because for 160 years the property belonged to the More family of Loseley and many documents relating to it are contained in the family archive (the Loseley Manuscripts), deposited at the Surrey Record Office (Guildford Muniment Room). In addition a large amount of detailed information on the history of Godalming Hundred, including Catteshall, was

collected by Mr Percy Woods (1842–1922) whose manuscript notes and transcripts are held by the Surrey County Library, Godalming. The Navigation, local authority, Quaker and Onslow family records also provide a wealth of information about the mill and this is supplemented during the last 200 years by much printed material especially in the journals of the paper trade. Thus it has been possible to prepare an unusually detailed account of the history of the mill and of its owners, equipment and products.

Godalming formerly had six water-mills (Fig 1). The sites of three of these, Eashing (SU 945438), Westbrook (SU 966442) and Catteshall (SU 982444), are on the Wey. Eashing is upstream, Westbrook near the town and Catteshall downstream near the parish boundary with Shalford. The remaining three mills, Enton (SU 957406), Ockford (SU 962433) and Hatch (SU 966438), are on the River Ock, a fast flowing but small tributary stream which enters the Wey near Westbrook Mill. Catteshall therefore has the greatest flow of water. This is channelled by means of a mill-stream along the south side of the valley to create a head of about 2m of water. This stream is now in fact the official course of the River Wey, the original water-course, the Old River, having been made redundant when the Navigation was constructed. The mill is 32 km by canal from the confluence of the River Wey with the Thames at Weybridge (Fig 1). It is located on alluvium overlying the Hythe Beds of the Lower Greensand.

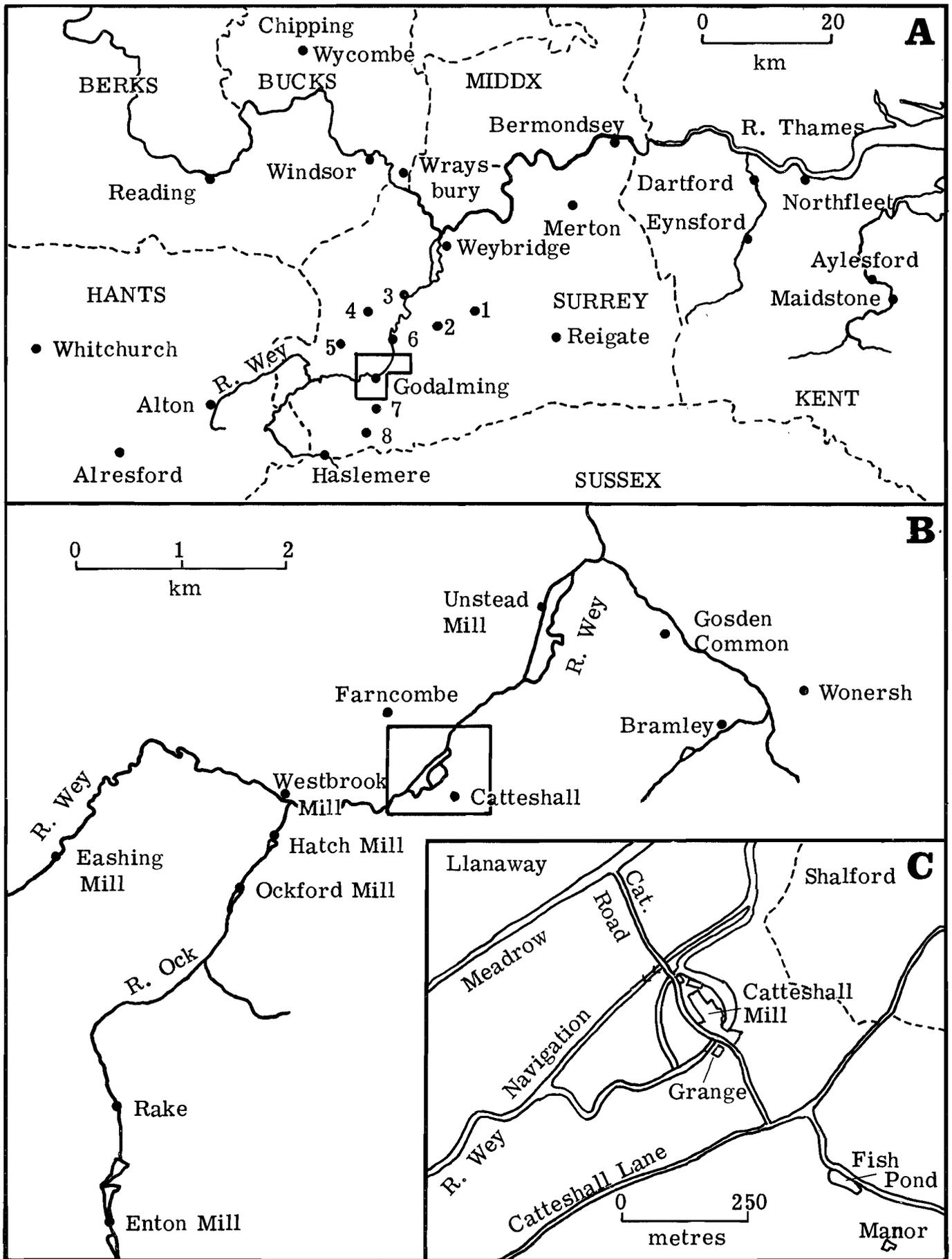


Fig 1 Location maps showing towns, mills and other features mentioned in the text. In A the numbers near Godalming correspond to East Horsley (1), West Clandon (2), Woking (3), Worplesdon (4), Wanborough (5), Guildford (6), Hambledon (7), and Chiddingfold (8)

## EARLY CORN-MILLING AND THE INTRODUCTION OF FULLING

### Robert and Thomas atte Mulle, John Fuller and others 1086–1393

The earliest record of a mill at Catteshall is claimed to be the statement in Domesday Book of 1086 that there were three mills in Godalming valued at 41s 8d.<sup>1</sup> It is suggested that these three ancient mills (which would have been water-powered corn-mills) were Catteshall, Westbrook and Eashing,<sup>2</sup> although Hatch Mill must also be a strong candidate for this distinction. Indeed there is no specific mention of Catteshall in Domesday, its separate existence as a manor seeming to date from the early 12th century.<sup>3</sup> In 1141 the Empress Matilda, and later her opponent King Stephen, confirmed a gift of land at Windsor and Catteshall to Reading Abbey.<sup>4</sup> These charters refer to woods, open-ground, meadows, pastures, waters, ponds and mills. The earliest known explicit reference, however, to a mill at Catteshall occurs in a survey of the manor made in 1300 on the death of the lord.<sup>5</sup> This lists eleven free tenants paying together a total of £4 17s 8d annual rent. By far the largest single rent was the £2 paid by Robert atte Mulle for four acres of land and one water mill. The total rents of the customary tenants at this date amounted to £1 18s 9d. A similar survey<sup>6</sup> made eight years earlier unfortunately includes no detailed rent list. The total rents are however so similar (free tenants £5 4s 10d, customary tenants £1 12s 4d) that a mill must already have been in existence in 1292. The 16 customary tenants in 1300 included Robert Sigar, William Brunynges, Robert atte Were and John le Parke whose family names feature in the later history of the mill.

The earliest deed to Catteshall Mill surviving among the Loseley Manuscripts is a quitclaim or release and disclaimer of all rights dated 1321 (Plate 1).<sup>7</sup> It is from Robert de Rake of Witley to Thomas atte Mulle of Catteshall and refers to a messuage, two mills and land. The mills remained the property of Thomas' family until 1393<sup>8</sup> and in the meantime the name 'atte Mulle' is recorded many times. In 1324/5 Robert atte Were the Prepositor of Catteshall collected £6 18s 9d in rents and also received 2s 1d instead of 25 sticks of eels and 9d for land from Thomas atte Mulle.<sup>9</sup> In the Surrey taxation returns of 1332 ten residents of Catteshall are listed including Thomas atte Mulle who was assessed at 16d, Robert Sigar (3s 5d), Robert atte Were (5s 4d) and Nicholas Bronyng (8d).<sup>10</sup> Others on the list whose family names occur later are Robert Neyl (22d) and Godfrey Beneyt (8d). The name 'atte Mulle' occurs 32 times in the Surrey 1332 returns, the only other Godalming entry being Richard atte Mulle. However Alan atte Wulle and Agnes atte Wulle could be mis-spellings for Mulle so that Westbrook, Hatch and Eashing Mills could all have been occupied. The Catteshall Manor court rolls refer to Thomas atte Mulle in for example 1360, 1370 and 1376.<sup>11</sup> In 1360 Juliana atte Mulle is also mentioned and in 1384 Alice atte Mulle and Robert atte Mulle testified in connection with a quitclaim.<sup>12</sup> A tax return of 1380/81 includes Alice atte Mulle (2s) but not Thomas.<sup>13</sup> By a feoffment of 1393 Thomas atte Mulle of Catteshall sold his freehold property consisting of all his land and two mills in Catteshall and Bramley to Richard Lanewey of Farncombe.<sup>14</sup> The court rolls of 1407 refer to a house 'recently Thomas atte Mulle's'.<sup>15</sup>

During this period a fulling-mill appears to have been constructed at Catteshall. Fulling is the process of thickening woollen cloth by pounding it in a solution of fullers earth. As cloth-making was by far the largest industry in the medieval period the mechanization of the fulling process which became widespread in the 13th century

initiated a minor industrial revolution.<sup>16</sup> Previously the work had been carried out by walkers who trod the cloth underfoot. Then fulling-mills were introduced in which water-powered wooden mallets pounded the cloth which was placed in a trough or stock.<sup>17</sup> Although the 1321 quitclaim concerns two mills there is no record of fullers at Catteshall before 1360. The taxation returns of 1332 record the names of Robert le follar, William le follar and Thomas le Follar at Farncombe.<sup>18</sup> Then Peter le fullere is mentioned in the Catteshall court roll for 1360<sup>19</sup> and John Follere and Juliana his wife were taxed 2s at Catteshall in 1380/81 when there were no fullers at Farncombe.<sup>20</sup> John Fuller is in the Catteshall court roll for 1384,<sup>21</sup> and in 1391 Thomas atte Mulle conveyed his fulling-mill at Catteshall to him.<sup>22</sup> The feoffment which confirmed this sale refers to a house, floodgate, water-course, two *tynturas* of length 18 perches, land and five staples with bayes. Although *tyntura* can sometimes be translated as dye-vat, the length (about 100 m) of those described here makes it more likely that it means tenters or tenter-frames, used for stretching the cloth after it had been fulled at the mill. The feoffment also describes plots of land for a house, a new fulling-stock and a new *tyntura*. It indicates that the estate was freehold and it is interesting that Thomas atte Mulle owned both the corn-mill and the fulling-mill. When John Fuller conveyed the fulling-mill in 1405 to Richard Lanewey (who had in 1393 bought the mills from Thomas atte Mulle) it appears that the new features referred to in 1391 had not in fact been built.<sup>23</sup> Fuller is described in the deed as 'recently dwelling in Catteshulle', and in the same year was fined at Catteshall court for default of suit.<sup>24</sup>

## CORN-MILLING AND FULLING

### The Lanewey Family 1393–1595

The Lanewey family who acquired the corn-mill at Catteshall in 1393 and the fulling-mill in 1405 were already well-established in the district. In 1332 John and Emma Lanewey were taxed as residents of Godalming town.<sup>25</sup> By 1360 the family were at Catteshall as John Lanewey was fined 2d at the manorial court<sup>26</sup> and in 1375/6 both John and Richard Lanewey are mentioned.<sup>27</sup> Five years later Richard was taxed 2s 6d at Farncombe and William Lanewey 4d at Catteshall.<sup>28</sup> Richard Lanewey, described as 'of Farncombe' when in 1393 he purchased Thomas atte Mulle's Catteshall property, in 1407 did fealty to the lord of the manor for a tenement and two water-mills and a marsh with appurtenances in Catteshall.<sup>29</sup> However in 1411 he transferred the fulling-mill to his son William and William Mulleward.<sup>30</sup> The latter also appears to have acquired the corn-mill as in 1415 he conveyed to William Neel and John Cheteye senior of Eashing lands and two water-mills in Catteshall which it was said his father John had from Richard Lanewey.<sup>31</sup> Nevertheless in 1428/9 a rental for the manor states that 'William Lanewey holds 4 acres of land, two water-mills and one marsh and pays for them per annum 43s and mows for one day with two men and gives ten sticks of eels of the value of 3s 4d and owes suit'.<sup>32</sup> This suggests that the conveyances of 1411 and 1415 may have been made to effect trusts, possibly to avoid feudal dues. It is worthy of note that at Catteshall in the fifteenth century services still attached to freehold property. The part-payment of rent in eels, there being 25 eels to each stick, was a common practice.<sup>33</sup> Eel traps were a feature of many mills, forming part of the associated water-courses. The rent paid by William Lanewey was by far the largest, the next highest being 10s. One of the other tenants paid

3s 4d for a meadow called Tentermede which must have contained tenter-frames.

Thomas Lanewey, owner of the mills later in the 15th century, is recorded as having conveyed the property to Thomas Glover and John Syger who then transferred it to Robert Champion, John Babbe, Richard at Nowre and Thomas Chytey. They in turn in 1483 conveyed it to Thomas Shyre, William Chytey alias Passhelawe, Richard Elyot and John Chytey.<sup>34</sup> However, despite these complex transactions, the Lanewey family still appear to have controlled the mills, as in 1484 John Lanewey, miller of Catteshall Mills, was said by Thomas atte Roke the tithing-man to have taken excessive tolls.<sup>35</sup> A taxation list which dates from between 1485 and 1492 includes Reginald Bray who was charged 20s for the manor. Thomas Lanewey (4s), Thomas at Roke (16d), Will Nele (9d), Juliana Chetey (4d), Robert Champion (4d) and William Champion (4d) were among 12 other tenants who paid a total of 7s 7d.<sup>36</sup>

The rent of 43s and ten sticks of eels, by then valued at 3s 6d per annum, was still being paid in 1509/10 when John Lanewey was said to have held, before he died, a tenement and watermill, a garden, a croft of land next the water, four acres of land and a marsh.<sup>37</sup> At this time Richard Smyther and John Benet also had an interest in the mill. In 1510, after John Lanewey's death, they conveyed the property to his son and heir Thomas at the request of his widow Ysote.<sup>38</sup> These references are to a single water-mill which must have been the corn-mill but in 1546/7 Arnold Champion died seised of a fulling-mill and garden held of Thomas Lanewey at a rent of 12s but worth a clear £4 a year.<sup>39</sup> His heirs were Thomas, son of James Hobson, and Jane his wife. At this time the woollen trade in the Godalming area was flourishing and the comparatively low rent is simply an indication that fulling-mills were smaller establishments than corn-mills. In 1549 Thomas Lanewey senior left the corn-mill to his son Thomas Lanewey junior the rent being 46s 6d per annum plus other services.<sup>40</sup> No eels are mentioned but clearly their value is included in the rent. The will of Thomas Lanewey junior is dated 1558 and he left his property to his son William.<sup>41</sup> However his wife Anne was to have all his 'landes and tenements and mylles, rentes, reversions and services untill William my sonne come to the age of 23 years'. After Thomas died Anne his widow married Henry Wheler and in 1570 he was the miller. He paid 46s 6d rent plus 8d for two harvest days and also 5s for one acre of land called Ashpiece lying 'near the bayes at the weir' where the mill-stream was to be 'turned away for the repairing of the mills'.<sup>42</sup> Three years later it is recorded that he took excessive tolls and had unsealed measures.<sup>43</sup> However by 1574 William Lanewey must have reached the age of 23 and he held the mill.<sup>44</sup>

It is not until 1581 that a direct comparison of the value of the corn-mill and the fulling-mill is recorded. In that year William Lanewey of Catteshall, yeoman, leased the property for 21 years to Thomas Chennell of Wonerish, 'myluer'. The terms were £100 down and £10 per annum for a messuage with corn-mill and malt-mill, mill-pools, floodgates, fishing and lands including the Leye, the Inmead, Merys Croft, Teynte acre, Little Garden and two acres in the common field. There was also 10s rent per annum from the fulling-mill.<sup>45</sup> Thus the rent of the fulling-mill had declined from 12s in 1546/7 to 10s in 1581 and the corn-mill and associated property was worth about 20 times as much. This is the first known reference to a malt-mill at Catteshall although malting was usually linked with corn-milling. It was a skilled craft requiring a large area of floor on which barley previously soaked in water was spread out to germinate. This produced enzymes which converted the starch content of the grain into sugars. The process was halted at the appropriate stage by heating the resulting malt in a kiln. The field

name Teynte acre in the lease is probably a further reference to tenter-frames.

Only a year later, in 1582, William Lanewey sold to Richard Hardinge of Wanborough his watermills and other property at Catteshall for £200.<sup>46</sup> Hardinge was to receive the £10 per annum rent from Thomas Chennell, whose son Thomas was baptised in the same year.<sup>47</sup> By 1583 however Thomas Mather was the miller and took excessive tolls,<sup>48</sup> and in 1590 Robert Plonker, miller, was fined 12d for the same offence.<sup>49</sup> In the same year Plonker took out a 21 year lease on a house at Catteshall.<sup>50</sup> He had however been resident in the district for some years as in the Surrey musters for 1583 he is described as a 'bill-man of the second sorte'.<sup>51</sup> In 1593 he was taxed 8s out of a total of £3 2s 8d for Catteshall and again fined for taking excessive tolls, but only 6d. In the same year it was reported that the bridges called Millbridge and Pond Bridge were 'ruinous and in decay so that the lord's bondmen were unable to ride across them to the common hurt', and that 'Robert Plonker tenant of the Corne Mill ought to repair the Pounce Bridge and half the Mill Bridge and that James Hobson gent. ought to repair the other half of the same bridge by reason of his mill called the Fulling Mill'. The penalty for failing to do so was 20s.<sup>52</sup> The Hobson family had inherited the lease of the fulling-mill from Arnold Champion in 1546/7 and had held a tenement at Catteshall called Brownyns since at least 1570.<sup>53</sup> This was presumably the property owned by William Brunynges in 1300; it features frequently in the later history of the mill. In 1595 Hobson, described as of Bradley in Woking, sold the fulling-mill and a rood of land called le Plott for £30 to Hardinge who by this time had moved to Holybourne near Alton in Hampshire.<sup>54</sup> Plonker died in 1598.<sup>55</sup>

After nearly two centuries the Lanewey family had severed their connections with Catteshall Mills. However they remained in the area for some years. In the musters, Thomas and William Lanewey are described as billmen of the second and best sorts respectively.<sup>56</sup> Three children of William and Ann Lanewey were baptised in 1583, 1584 and 1588 but when one of their daughters was buried in 1600 William was dead. The widow Lanewey was buried in 1626. There are no entries under Lanewey in the Godalming parish registers after 1640<sup>57</sup> and the name does not occur for Godalming parish in the Hearth Tax of 1663/4.<sup>58</sup> It survives as the local place-name Llanaway at Farncombe.

## CORN-MILLING AND THE DECLINE OF FULLING

### The More Family 1595–1656

Within a few weeks of acquiring the fulling-mill Richard Hardinge sold both the corn-mill and the fulling-mill to Sir William More of Loseley who had purchased Catteshall Manor in 1565. He received £420 for the corn-mill which again indicates the relative importance of the two activities.<sup>59</sup> William More had inherited Loseley Manor in 1549 and built the present Loseley House which was completed in 1569. In 1600 he was succeeded by his son Sir George More<sup>60</sup> who in 1614 sold 'Catteshall Manor, the mills and the messuage and garden which was previously Lanaway's' for £1,500 plus 'natural love and affection' to his son Sir Robert.<sup>61</sup> In 1615 Sir Robert leased the mills and a messuage and garden formerly occupied by William Tofte and then by William Watts to William Waterer and William Giles both of Woking for ten years at £20 per annum.<sup>62</sup> Later that year he mortgaged the manor, mills, messuage and land to Wil-

William Ferrers of London for £1,100.<sup>63</sup> Then in 1616, together with Richard and George Bridger, clothiers, of Godalming, he leased the watermills, fulling-mill, William Tofte's house and 13 acres of land at Catteshall to Thomas Bradfolde of East Horsley for 40 years and to Bradfolde's nephew William Penycod for a further 2,000 years at a peppercorn rent.<sup>64</sup> The down payment was £660 and the land included Bronningses. In a quitclaim of 1617 William Ferrers renounced for a 'competent sum' his rights to the mills and messuage but not the manor.<sup>65</sup> It thus appears that under the Mores, William Tofte and then William Watts were the millers. The Godalming parish registers<sup>66</sup> do not record either name but the surnames were common in the area and several Tofts figure in the later history of the mill.

William Penycod died intestate in 1626 and his interest in the mills passed to Henry Penycod.<sup>67</sup> The latter also acquired Thomas Bradfolde's lease when he died in 1638 seised of '10 acres of land with appurtenances called Bronninge alias Rollands alias Whites, a messuage, one grain-mill and one fulling-mill with the appurtenances called Lannawayes'.<sup>68</sup> Thomas Tydie was the miller at this time as indicated by his will of 1639, in which also he left his best cloak to his father-in-law John Hubbard, his best breeches to Matthew Clarke and the rest of his property to his wife.<sup>69</sup> The Tydie family had been at Catteshall since at least 1583 when Anthonie Tydie was described in the Surrey Musters as a 'Billman of the Best Sorte'.<sup>70</sup> He had a son in 1584 who was probably Thomas Tydie the miller.<sup>71</sup>

Henry Penycod in his will of 1652 left his son, another Henry, 'all his lands and mills at Cattsell in the tenure of John Westbrook, Humphrey Taught (Toft), Mr Love and Samuell Chittie'.<sup>72</sup> By 1656 Henry Penycod junior had died and his son John and Joane his wife sold the 2,000 years lease of the mills to Arthur Onslow whose father had bought West Clandon in 1641. The property was described as 'a watermill and mill-house containing in it a Corne-mill and a malt-mill and also a fulling-mill and mill-house contayning in it two stocks and a halfe and one Potier forr the fulling and thickening of cloth and all houses, buildings, stables, pondes, bayes, houses, streams, damms, sluices, floudgates, wastgates and mill-stones'. The price was £180.<sup>73</sup> The deed also contains a proposal to construct a water-channel which would bypass the mill while repairs were being carried out. Humphrey Toft and Robert Rommant were said to hold several leases of 17 years, the rents totalling £26. Rommant is not otherwise known but Humphrey Toft occurs frequently in a great variety of spellings in the parish registers. He married Ann Jakman in 1622 and they had a large family before she died in 1643. His eldest son Owmfay (Humphrey) was born in 1625 and it seems likely that he in turn had a son Humphrey in 1647.<sup>74</sup> In October 1656 Humphrey Toft and John Smyth were ordered to repair 'upon payne of 20s' the bridges at the mill which were again in decay. Toft died the following year and by 1658 the bridges were 'very ruinous'. Robert Snelling and Henry Toft, tenants of the mill, were instructed to carry out the repairs 'upon payne of 40s'.<sup>75</sup> William Watts, Edward Hunt and Thomas Waterer, millwright are also recorded in the deed of 1656 as being previous tenants. Watts was at the mills in 1615 when William Waterer took the lease<sup>76</sup> and there are later references to the Hunt family. Samuel Chittie who was a tenant in 1652 died in 1655.<sup>77</sup> He married Dorothy Jakis in 1622 and they both testified to the will of Thomas Tydie in 1639. It seems that they had no children.<sup>78</sup> As early as 1415 John 'Cheteye' seems to have acquired an interest in the mills<sup>79</sup> and again in 1483 Thomas, William and John 'Chytey' were involved in its conveyance.<sup>80</sup> The surname Chitty was very common in Godalming<sup>81</sup> and was particularly associated with the cloth industry so that

the family's interest in Catteshall Mills may have been concerned with fulling.

## PAPER-MAKING REPLACES FULLING

### William Hunt, William West and the Smither Family 1656-1755

A major change of activity occurred at Catteshall Mill within a few years of the Onslow family purchasing the property in 1656. The local cloth industry was in decline<sup>82</sup> and it appears that the fulling mill closed down and the premises were taken over by a paper-maker. The Court of Quarter Sessions sitting at Reigate in 1663<sup>83</sup> heard a complaint on behalf of Roger Graling, apprentice to Robert Ingham of Godalming, paper-maker who 'be lately gone from his habitation but whither is unknowne'. Graling being 'destitute of a service desired to bee discharged from his said master and to be att liberty to bynd himselfe as apprentice to William Hunt of Godalminge papermaker for the residue of his Terme'. In 1661 Robert Ingham and Robert Hunt of 'Catshull' jointly contributed 2s 6d to a lay subsidy<sup>84</sup> and in 1662-4 William Hunt had two hearths at Catteshall<sup>85</sup>. Thus it is clear that paper was being made at Catteshall by 1661, possibly by the Ingham and Hunt families working in partnership. An earlier member of the Hunt family could be the Edward Hunt who is recorded as a previous tenant of the mill in the 1656 deed.<sup>86</sup> That Robert Ingham left the district is corroborated by the facts that two of his children were baptised at Godalming in 1661 and 1663 but that there are no later entries and his name does not appear in the hearth tax returns of 1662-4.<sup>87</sup> Also in 1658 the corn-mills at Eashing were conveyed to William West paper-maker of Wraysbury, Bucks, just across the Thames from Surrey.<sup>88</sup> West had two hearths at Eashing in 1663 and 1671, but none in 1662.<sup>89</sup> He died in 1673 and was important enough to be buried 'in ye church'.<sup>90</sup> Aubrey writing about Godalming between 1673 and 1692 states 'that in the Reign of King James I course Paper commonly call'd whited brown Paper was first made in England especially in Surrey and about Windsor; and this Place I have frequently heard bore the Bell from all this County for its excellency in this Manufacture'.<sup>91</sup> He says that there were two paper-mills at Godalming. They could have been Catteshall and Eashing, but Westbrook Mill may also have been making paper at that time.

In all, twenty hearths are recorded at Catteshall in 1662, the largest number, five, belonging to William Love, gent., who was probably the Mr Love who was one of the tenants of Henry Penycod in 1652.<sup>92</sup> In addition William Love junior had two hearths. He was the occupier of a messuage and land known as Leathers (perhaps Heathers) or Parkelands which his wife Dorothy had inherited from her brother George Parke in 1660.<sup>93</sup> The Parke family seems to have been at Catteshall since 1300 when John le Parke was a customary tenant.<sup>94</sup> In 1664 Love sold Leathers to William Pennycod<sup>95</sup> and in 1671 there is no mention of the two Loves but Oliver Pennycod held three of the 34 hearths which were taxed.<sup>96</sup> Thus although the Penycod family had sold Catteshall Mills<sup>97</sup> they still held interests in the area. Indeed Agnes Rapsley, daughter of Henry Penycod, became Agnes Hunt when she married<sup>98</sup> and her husband could have been William Hunt the paper-maker. None of the hearths belonged to the Hunt family in 1671 but study of these records suggests that Richard ffarndell (or Wandell) was occupying William Hunt's former house and he could have been the new paper-maker. When William Penycod died in 1676 Leathers passed to John Penycod and then when

he died in 1680 to Joane Hunt and her heirs.<sup>99</sup> This property features prominently in the later history of the mill.

William Wootton had five hearths in 1671 and in a subsidy of the same date was listed as occupier of property of Arthur Onslow valued at £40 and of John Penicodd valued at £8.<sup>100</sup> Sir William More's property including the manor house was valued at £57. Thus it appears that Wootton was the miller and, as the number of hearths corresponds to that for William Love in 1662, Love could have been the previous occupier.<sup>101</sup> In addition William Smither of Bramley held land valued at £1 in 1671. He appears to have married Ann Tidy in 1643 and she could have been related to Thomas Tydie the miller who died in 1639 although she was not his daughter.<sup>102</sup> Smither died in 1688 and in his will, in which he is described as a 'millear', he left his house to his sons Thomas and William, the latter to have the south end 'as the widow chitty liveth in'.<sup>103</sup> This William appears to have become 'Miller of Catteshall'. He was described as such when his wife Ann was executrix of the will of John Callingham in 1696.<sup>104</sup> Ann Smither, widow, died in 1698 and her son William died of smallpox in 1701.<sup>105</sup> It is interesting that nearly 200 years earlier, in 1510, Richard 'Smyther' was involved in a conveyance of the mill.<sup>106</sup>

William Smither must have been the corn-miller at Catteshall but it appears that the paper-mill was still active as in 1699 John Wilde, a papermaker, lived at neighbouring Farncombe.<sup>107</sup> Also in 1706 'William West acknowledged land at Catteshall called Gardeners alias Bullendens now called Gussells rent 20d'.<sup>108</sup> It seems likely that he was the son of William West, papermaker of Eashing, being born in 1668 and buried like his father in Godalming Church in 1716.<sup>109</sup> In particulars of the estates of Sir Richard Onslow dated 1707 William West is stated to be the tenant of Catteshall Mills, the rent being £92, and in 1708 a further list refers to a 'Paper mill and Corn mill called Catteshall Mills'.<sup>110</sup> This is the earliest specific reference to a paper-mill at Catteshall. The West family remained at Catteshall until at least 1765 when a John West paid the rent of Gussells.<sup>111</sup> This property also features in the later history of the mill.

Meanwhile the Smither family had also retained their links with the mills. William Smither's name occurs in a list of voters which is dated 1714/15 or 1722<sup>112</sup> and in 1745 Sir Richard Onslow leased the mills to Ann Smither for 21 years.<sup>113</sup> The rent was £80 per annum plus two fat capons at Christmas and the tenant agreed to keep one hound or spaniel for Sir Richard. It seems that Ann Smither was already the occupant of the mills as in 1739 'the widow Smither' paid £5 8s land tax, almost a quarter of the total for Catteshall.<sup>114</sup> The lease of 1745 provides valuable information about the contents of both the corn-mill and the paper-mill which are said to be under one roof. The corn-mill is stated to have 'two pairs of stones: one cullen running stone 3 ft in diameter and 7 in thick with a bedstone 5 in thick and one pair of peek stones the runner 5½ in thick and 4 ft 8 in in diameter and the bedstone 3 in thick'. Cullen stones were good quality blue stones from Cologne and the 'peek' stones were from the Peak District of Derbyshire. Two inventories dated 1744 are filed with the lease and one of these is reproduced as Plate 2. It states that the 'pear of Cullings' were 3 ft 8 in in diameter and that there was a french bedstone for the peak runner. This would have been a composite French Burr stone. There were also four boulding mills, used to remove the bran from the meal, with associated running tackle. The paper-mill had 'one engion, three mortars, vates, one wett press, one dry press, and tribes and standers'. The mortars were troughs of a stamping-mill in which rags were pounded by water-driven hammers to produce the stuff or pulp from which the paper was made. The equipment was similar

to that used for the fulling of cloth so that fulling-mills could without difficulty be converted to paper-making. The engine would be a Hollander or beating-engine. This machine replaced stamping-mills for paper-making and was introduced into this country from Holland during the 18th century. It was again powered by water and contained a rotating set of knives which cut up the rags. The wet press was for squeezing moisture from sheets of paper after they had been formed on moulds dipped into vats of stuff. The trebles and standers were frames supporting hair ropes upon which the sheets of paper were hung for drying before being placed in the dry press for finishing. The 1745 lease also refers to banks, bayes, mill-wheels, aprons, bridges, going-gears, utensils and implements which were associated with the mills. It was sealed and delivered in the presence of John Knight and James Shrubb. Although there are later references to the Smithers it is John Knight and his son who dominate the next period.

## THE EARLY YEARS OF THE GODALMING NAVIGATION

### John Knight and his Family 1755–1782

The River Wey had been navigable from the Thames at Weybridge to Guildford since 1653 and in the 1750s plans were being prepared to extend the Navigation to Godalming. Two detailed maps of the area between Godalming and Catteshall, prepared in connection with the proposed development, survive.<sup>115</sup> A section of the first map showing Catteshall Mill is reproduced in Fig 2. It shows four buildings near the mill-pool, the mill-stream, and the much smaller 'Old River' corresponding to the original water-course. The remaining features on this map are essentially the same as those on the second plan which is reproduced in full as Fig 3. In particular plots of land are shown belonging to Mr Allen, Mr Chitty, Mr Lees, Mr Toft, Mr Yalden, The Company of Skinners and Sir More Molyneux, who as a descendant of the More family held Catteshall Manor. However the second plan also marks the proposed route of a new water channel by-passing the mills. It is interesting that the lock on this cut is shown near the point where the mill-stream and the 'Old River' diverge and not as it was later actually constructed, near the mill. In addition an 'Intended Wharf' is shown on Mr Toft's property. Catteshall Mill is labelled but only two buildings are shown, one on either side of the mill-pool. Earlier smaller scale maps of the county provide no additional reliable information about the mill.

The Godalming Navigation Act of 1760<sup>116</sup> states that a fine of £20 would be imposed if the paddles of the sluices at the mills were not controlled satisfactorily. However the miller could demand up to £1 1s a day if the Navigation interfered with the operation of the mill. It is clear that trouble between the two parties was anticipated.

John Knight who had witnessed the 1745 lease to Ann Smither was described as a paper-maker of Godalming when in 1755 he took an apprentice Richard Rose.<sup>117</sup> Later, in 1765, as paper-maker and miller of Catteshall he insured 'the utensils and stock in the separate timber and tiled paper-mill for £250, the stock in the separate timber and tiled ragghouse for £150 and the utensils and stock in the separate timber and tiled water corn-mill for £300'.<sup>118</sup> It was clearly important for fire insurance purposes to state when buildings were detached and this indicates that the corn- and paper-mills were no longer

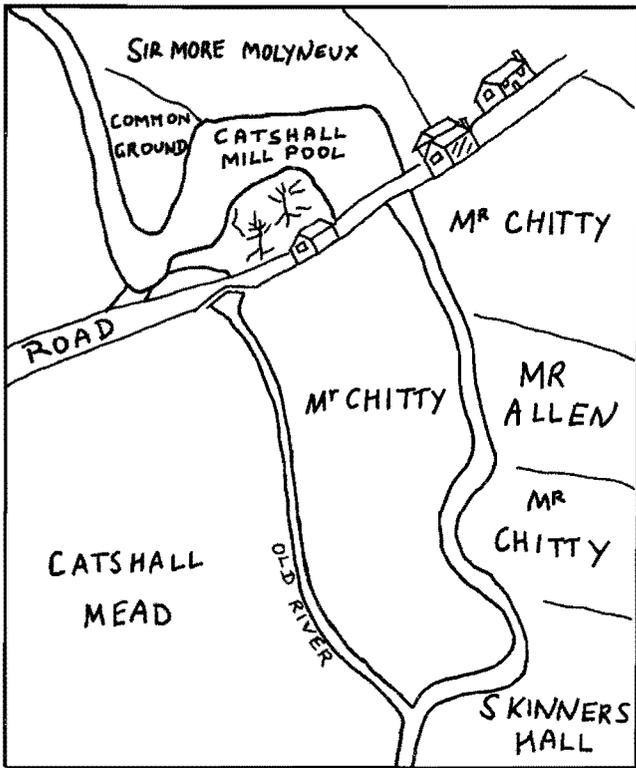


Fig 2 Copy of part of a plan prepared in about 1755 in connection with the formation of the Godalming Navigation. From a copy in the Woods Collection, Surrey County Library, Godalming

as stated in 1745 'under one roof'. It seems that in 1765 the two activities were roughly of equal importance.

John Knight was concerned in 1767 with the conviction of a rag-thief.<sup>119</sup> He claimed 'that he hath at divers times lost great quantities of rags out of his house and rag house and a pair of shoes and that he doth suspect that they are concealed in the house of Edward Peto of Catshill'. He later stated that 'On searching the house of Edward Peto he found his shoes on Philip Peto his son'. It seems that the Peto family frequently sold fine rags to Godalming shopkeepers. Jane Avenell one shopkeeper said 'that she often told them they could not come honestly by them' but nevertheless paid them 2½d a pound for 6½ lbs of fine rags. Philip Peto, who was a labourer, then confessed that he had taken the shoes and the rags.

The Navigation had been opened in 1763 and two years later the Commissioners appointed Knight as surveyor for one year with a salary of £35 per annum.<sup>120</sup> The minute books record work he carried out in 1766 but in 1772 a complaint was made that John Knight had obstructed the Navigation. The matter was resolved to the satisfaction of both parties.<sup>121</sup> In 1773, in particulars of the Onslow estates,<sup>122</sup> Knight was the tenant or occupier of the mills at a rent of £80, the same as that specified in the 21 year lease of 1745 to Ann Smither.

In 1776 Knight was involved in transactions concerning a leasehold house and freehold land called Philpott Field which had previously belonged to the Smither family.<sup>123</sup> It appears that William Smither, perhaps the son of Ann Smither, had died and his widow together with another William Smither and John Smither were involved in the deal. A mortgage on the property was assigned, by Knight and the executors of a Mrs Ratcliffe, to Mrs Shrubbs. Mrs Ratcliffe is probably to be identified with Jane, who died

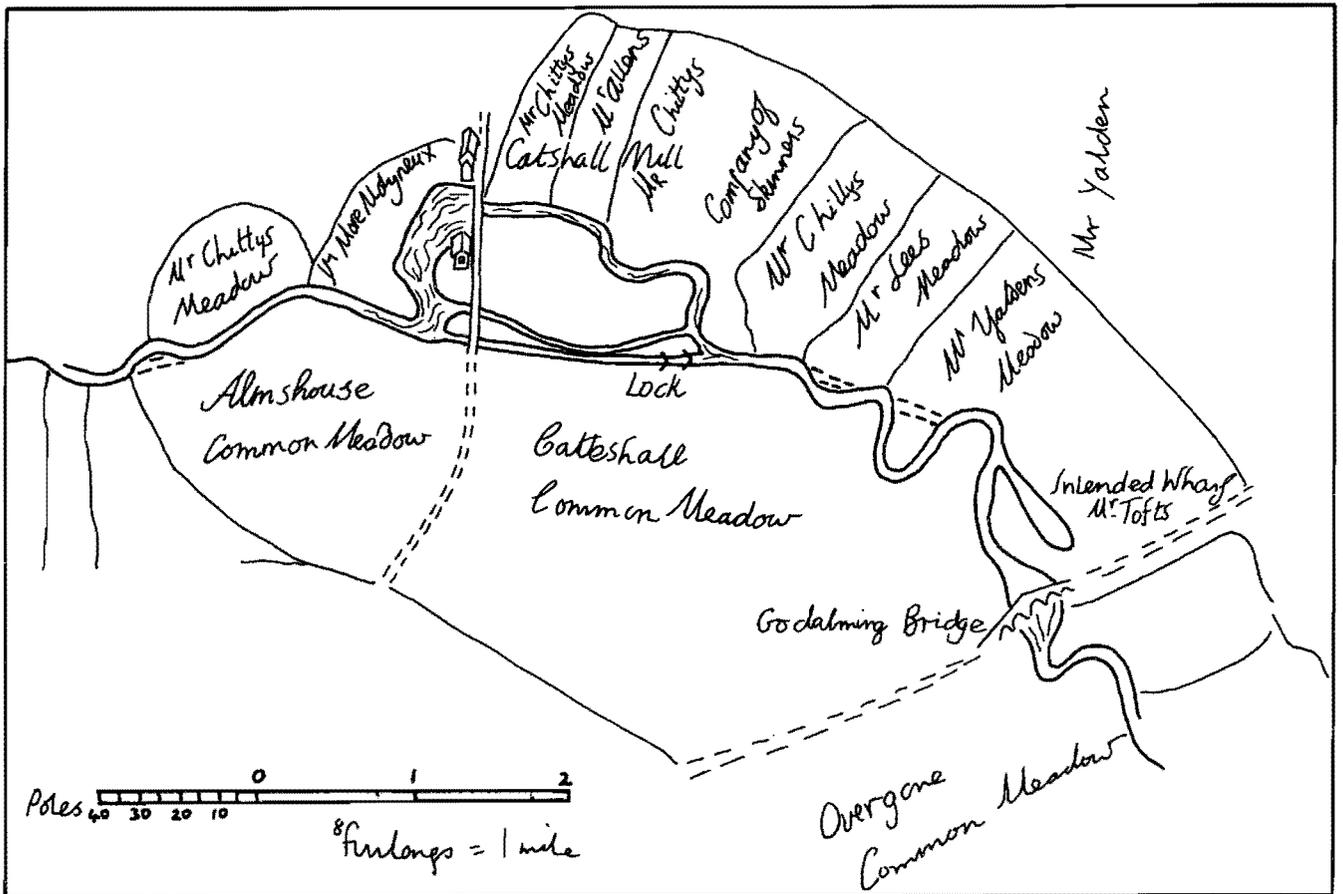


Fig 3 Copy of part of 'A plan of the River Wey from Guildford to Godalming in the County of Surrey; with a Scheme for making the same navigable'. From a copy in the Woods Collection, Surrey County Library, Godalming

in 1775 and was buried in Godalming church. Mrs Shrubbs may have been the widow of James, who died in the same year, and who thirty years earlier had, with Knight, witnessed the mill lease.<sup>124</sup>

In 1777 a John Knight, mealman, of Meadow (the turnpike road from Guildford to Godalming) agreed to purchase from Henry Denyer of Godalming, innholder, his messuage, tenement, malthouse, backside and garden at Catteshall for £315.<sup>125</sup> This John appears to be the paper-maker's son, who had married Ann Hedger in 1770.<sup>126</sup> The following year the Knights, father and son, were bankrupt and at a meeting held at the Red Lion Inn, Godalming, the creditors agreed to accept £55. They also decided 'not to intermeddle with the contract' made by Knight for the purchase of a messuage and malthouse at Catteshall.<sup>127</sup> In his will dated 1778 John Knight the elder left to Sarah his wife his leasehold messuage formerly called Gussells and some land called Philpott Field.<sup>128</sup> The property was subject to a mortgage of £120. Gussells was the house previously occupied by the West family and is clearly the property discussed above which was mortgaged to Mrs Shrubbs. Knight's will was proved in 1779 and his son became tenant of the mills.

Lord Onslow offered Catteshall Mills for sale in 1778.<sup>129</sup> The prospectus states that the corn-mill was brick and had chambers over two large water-wheels, working three pairs of stones, in constant employ, together capable of grinding near 100 quarters of wheat per week. The paper-mill which was opposite the corn-mill was part brick and part boarded-and-tiled with tackle, engine and trough, a large drying house, rag house and other conveniences. It was usually employed in making writing paper. The property also included a substantial brick-and-tiled dwelling house with boarded kitchen, sashed parlour, a brew house, wash house, pantries, five bed-chambers and two garrets. Adjoining the mills was a good garden and associated with it was a piece of rich meadowland in Catteshall Mead containing about an acre and a small close of pasture called the Platt. This corresponds to the rood of land named le Platt in 1595. The whole of the premises were said in the sale particulars to be in the occupation of Mr John Knight at the very low rent of £80. He also paid one-third of the land-tax. The situation of the mills was claimed to be 'truly advantageous, as corn and materials for making paper is land upon it and flour and paper shipped for market immediately therefrom into vessels upon the River Wey; the whole stream of which forms the reservoir mill-pond and very fortunately the lock upon the Navigable River near the Mills is so placed as to take but very little water from the main stream and never impedes their working'. The mills were not in fact sold and in 1780 the Commissioners of the Navigation complained to Lord Onslow that John Knight was 'drawing off the water at the mill waste to the detriment of the Navigation'. It appears that the tumbling bay was in need of repair so that water was running waste and the commissioners claimed that the occupants of the mill were obliged to provide against such waste 'at their peril'. There were still problems two years later when John Knight told the clerk to the commissioners that if he did not draw up the sluices over-night his house would be flooded.<sup>130</sup> In 1782 it was ordered that the Navigation near Catteshall Mill be widened so that barges could pass while other barges were loading and unloading at the flourhouse.

From 1780 the land-tax returns provide detailed information about the owners and tenants of properties at Catteshall.<sup>131</sup> Lord Onslow held the mills until 1782, John Knight was the tenant and the tax was £10. Knight was clearly living in the mill-house adjacent to the corn- and paper-mills at this time. His own house, the former Denyer property which was taxed at £1 12s was occupied by his mother, 'the Widow Smither' and John Grover.

Gussells was also apparently occupied by his mother, the Widow Knight, the tax being 8s. Then in 1782 Lord Onslow finally sold the mills and several changes ensued.

## PAPER-MAKING AND CORN-MILLING CONTINUE

### Joseph Chandler and John Sweetapple 1782-1803

Lord Onslow sold the mills to Joseph Chandler of Guildford and John Sweetapple of Catteshall, millers, and in July 1782 they insured 'their house only situate at Catshill aforesaid in the tenure of John Knight, Miller, Brick Timber & tiled for £100, Water Corn Mill only separate Brick Timber and tiled for £600, Paper mill only separate Brick Timber & tiled for £300'.<sup>132</sup> The premium was £1 16s and the descriptions correspond well with the sale particulars of 1778. Both Chandler and Sweetapple were Quakers and in 1783 Sweetapple married Chandler's daughter Mary at the Friends' Meeting House, Guildford.<sup>133</sup> In 1763 Thomas Chandler the elder of Merton left to his son Joseph of Guildford, mealman, £20.<sup>134</sup> His other three children received £60, £65 and £70, which might indicate that he disapproved of Joseph's religion. Possibly the other Chandlers were members of the Established Church as in 1786 Thomas Chandler had a charitable benefaction to the parish of Merton of £33 a year vested in him.<sup>135</sup> In 1780 Joseph Chandler was one of the occupants of Guildford Mill and was instructed by the Navigation Commissioners to repair his flood-gates.<sup>136</sup>

As the name Sweetapple is unusual it is relatively easy to trace the family history. In 1596 a John Sweetapple was buried at Godalming but this seems to be an isolated record.<sup>137</sup> Later the Sweetapples were associated with Alresford in Hampshire and in 1677 Benjamin Sweetapple was married at neighbouring Alton at a public assembly of Friends. He or his son Benjamin is later referred to as a currier or leather dresser of Alresford. In 1702 Benjamin Sweetapple of Godalming married Anne Constable of Worplesdon at the Friends' Meeting House, Guildford. They had six sons, Benjamin, John, William, Thomas, George and Richard, between 1703 and 1718.<sup>138</sup> In 1729 Benjamin was among those who contributed towards the repair of Godalming Market House.<sup>139</sup> John Sweetapple in 1726 made a deposition before Lord Onslow relating to the infamous affair of Mary Toft of Godalming being delivered of several rabbits.<sup>140</sup> Then in 1739 at a monthly meeting of Friends at Guildford he was given a certificate of clearness to marry Ann Toft.<sup>141</sup> She was probably a descendant of the Tofts who were at the Mill in the previous century. It is not known whether the marriage took place but later the wife of John Sweetapple of Godalming, mealman, was called Hannah.<sup>142</sup> John and Hannah Sweetapple were buried at the Friends' burial ground Godalming in 1778 and 1795 respectively.<sup>143</sup> It is likely that John Sweetapple who with Joseph Chandler purchased Catteshall Mills in 1782 was their son.

After their marriage in 1783 John and Mary Sweetapple lived in the mill-house at Catteshall and John Knight moved to his own house. In the same year Knight's mother seems to have sold Gussells to Mrs Shrubbs to whom it was mortgaged and became a tenant at the Blockhouse which was owned by Mary Joyce.<sup>144</sup> This appears to be the property previously known as Parke-lands or Leathers. Joane Hunt who inherited Leathers from John Pencyod in 1680 married John Trigg in 1684,<sup>145</sup> and in 1741 William Chitty the elder of Godalming, maltster, left to his wife Jane his 'leasehold messuage and lands near Catshill late the estate of his Uncle Trigg

deceased'.<sup>146</sup> Chitty had paid the land-tax for a Catteshall property in 1739 and 1740.<sup>147</sup> In 1768 William Chitty of Godalming, maltster, (presumably the son of the 1741 Chitty) left to his niece Mary Joyce 'his messuage . . . called Blockhouse with the moor thereto in Catteshall on the S side of the Old River there with the appurtenances'.<sup>148</sup> Mary Joyce was a relative of James Joyce whose wife Elizabeth was the sister of John Knight's wife Ann.<sup>149</sup> The property clearly corresponds to the Chitty land shown on the plans of the 1750s (Figs 2 and 3). In 1783 the land-tax for the Blockhouse was 12s. The mills, Knight's house and Gussells were, as in 1782, valued at £10, £1 12s and 8s respectively.<sup>150</sup> Joseph Chandler, Sweetapple's partner in buying the mills, continued to live in Guildford.

Several documents dating from the period 1782-6 bear watermarks which appear to be associated with John Knight. An example consisting of Britannia and a reversible monogram 'JK' is given in Fig 4(a). However in 1786 the *London Gazette* announced that 'John Knight late of Catteshall Mill, Papermaker, Dealer and Chapman' had been declared bankrupt.<sup>151</sup> The Commissioners paid dividends in 1787, 1789, 1790 and finally in 1791<sup>152</sup> after which Knight became a paper-maker at Westbrook Mill. In 1794 with George Smith he insured his property at that mill and he remained there until 1803 when Smith became bankrupt.<sup>153</sup> Knight was still referred to as a paper-maker when he died aged 74 in 1823.<sup>154</sup>

Following John Knight's bankruptcy the lease of the paper-mill at Catteshall was offered for sale. An advertisement in the *Kentish Gazette* in 1787 states that the Mill had 'convenient Drying-houses, Rag-houses etc all in excellent Repair', and was worked by 'a fine Stream of Water' and was 'adjoining the navigable Cut by which Rags are brought to the Mill and the Paper conveyed to London at a very moderate Expence'. Seventeen years of the lease were unexpired and the rent was £40 per annum, land-tax allowed.<sup>155</sup> However it is not until 1794 that the next papermaker, Thomas Harrison, is recorded at Catteshall.<sup>156</sup>

Until 1794 John Knight continued to live in his Catteshall house although the land-tax was reduced from £1 12s to 16s. His mother still lived at the Blockhouse but in 1788 was joined by Richard Simmons. Between 1786 and 1788 Mrs Shrubbs sold Gussells to William Smyth and the new occupants were John Sweetapple and William Street.<sup>157</sup> Meanwhile in 1786 William Lee of Godalming, Mealman, insured his 'utensils and stock in Mr Sweetapple's Water Corn Mill situated at Catshall' for £500<sup>158</sup> and in 1787 John Sweetapple requested the Navigation Commissioners to enlarge the flour warehouses on their strip of land at Catteshall Mill and offered to meet the expense of erecting stone quoins for the support of these buildings.<sup>159</sup>

The Godalming poor-rate books survive for the period 1794-1835<sup>160</sup> and provide a wealth of information about the residents of the parish. At Catteshall in May 1797, for example, John Sweetapple held the corn-mill rated at £33 together with a stable, barn and yard (£1 10s), a meadow (£2) and a house (£2) and Thomas Harrison held the paper-mill (£40) and a house (£5) (Plate 3). In Godalming Town in 1794 the paper-mill held by Smith and Knight together with the house occupied by Knight was rated at £80. The third paper-mill in Godalming parish at Eashing was at that time held by Thomas Hall and rated at £26 10s.

Thomas Harrison was the paper-maker at Catteshall until 1803 and it seems probable that he used the watermark 'TH 1795' which is reproduced as Fig 4(b). He lived in the house previously occupied and still owned by John Knight. However from 1798 to 1812 he is also recorded as the paper-maker at Eashing and from 1804 occupied a house there. In addition he and his sons

William and Thomas were paper-makers at Westbrook Mill during the period 1811 to 1825. Clearly records that simply refer to 'Thomas Harrison paper-maker of the parish of Godalming' are rather inadequate in complex situations of this kind. From 1811 to 1821 the Harrisons were in partnership with William Twycross whose family also held the leather-mill at Westbrook and in 1813 became active in the leather trade at Catteshall.<sup>161</sup>

Joseph Chandler, described as a baker of Guildford, died aged 74 in 1795 and left his half-share in Catteshall Mills, which were in the tenure of John Sweetapple, husband of his daughter Mary, to his two sons William and Thomas.<sup>162</sup> The younger Chandlers played no active role at the mills however until 1804 when they took over the paper-mill on Thomas Harrison's departure.<sup>163</sup> They also took his place as occupier of John Knight's house. Meanwhile in 1795 John Sweetapple purchased the Blockhouse from Mary Joyce and went to live there. The 'Widow Knight', the previous tenant, is heard of no more but Richard Simmons the other occupant purchased and moved to a nearby house previously owned by Robert Rolls.<sup>164</sup> John and Mary Sweetapple had at least seven children, John Downham, Benjamin, Thomas, Elizabeth, Hannah, Jane and Sarah.<sup>165</sup> In 1803 John Sweetapple died.<sup>166</sup>

## THE ENCLOSURE AWARD AND THE END OF CORN-MILLING

### The Chandler and Sweetapple Families 1803-1836

The enclosure act for Godalming and Catteshall was passed in 1803 and the award was dated 1811. It contains the earliest available accurate map of Catteshall indicating the locations and shapes of all the buildings and a list of the owners of each plot of land.<sup>167</sup> A simplified version of the map showing the region near the mill is given in Fig 5. The mill, said to be owned by the late John Sweetapple, is shown as three buildings (labelled 1). Sweetapple also held the Blockhouse (2), a shed and garden (3), a common meadow (4) and a parcel of land (5) which he had purchased for £3 under the act.<sup>168</sup> This purchase was subject to a road 20 feet wide passing through it and then 'through the Mill Pool to Catshall.' On the opposite side of the pool was John Knight's house and garden previously Denyer's (6), and the house called Rolls (7) occupied by Richard Simmons. Gussells (8) and several other plots (9-12) were held by William Smyth. These are listed separately in the award and are described as 'Part of Seagers, Brownings late Smithers, Hawkins late Allens, Knights Mead and Scrivens late Allens'.<sup>169</sup> Most of these names recall earlier characters in the history of the mill including Robert Sigar and William Brunynges who were customary tenants in 1300. William Lee had several holdings (13-17) including a building immediately opposite the mill. The other owners were James More Molyneux (18-20) whose family had held the manor since 1565, the Company of Skinners (21), William Furlonger (22) and James Windebank (23, 24). The map also shows the Navigation with the lock correctly located but symbolically shown with the gates pointing downstream rather than upstream.

After John Sweetapple died his wife Mary was described in the land tax records as the owner and occupier of both the mill and the Blockhouse. She was listed as the owner up to 1831 but her eldest son became the occupier of the mill in 1816 and of the house in 1818.<sup>170</sup> The poor-rate records provide more detailed information, showing that from 1804 William and Thomas Chandler were at the paper-mill.<sup>171</sup> However in 1810 Thomas died aged 38<sup>172</sup> and for three years William Chandler & Co were the occupants, the rateable value

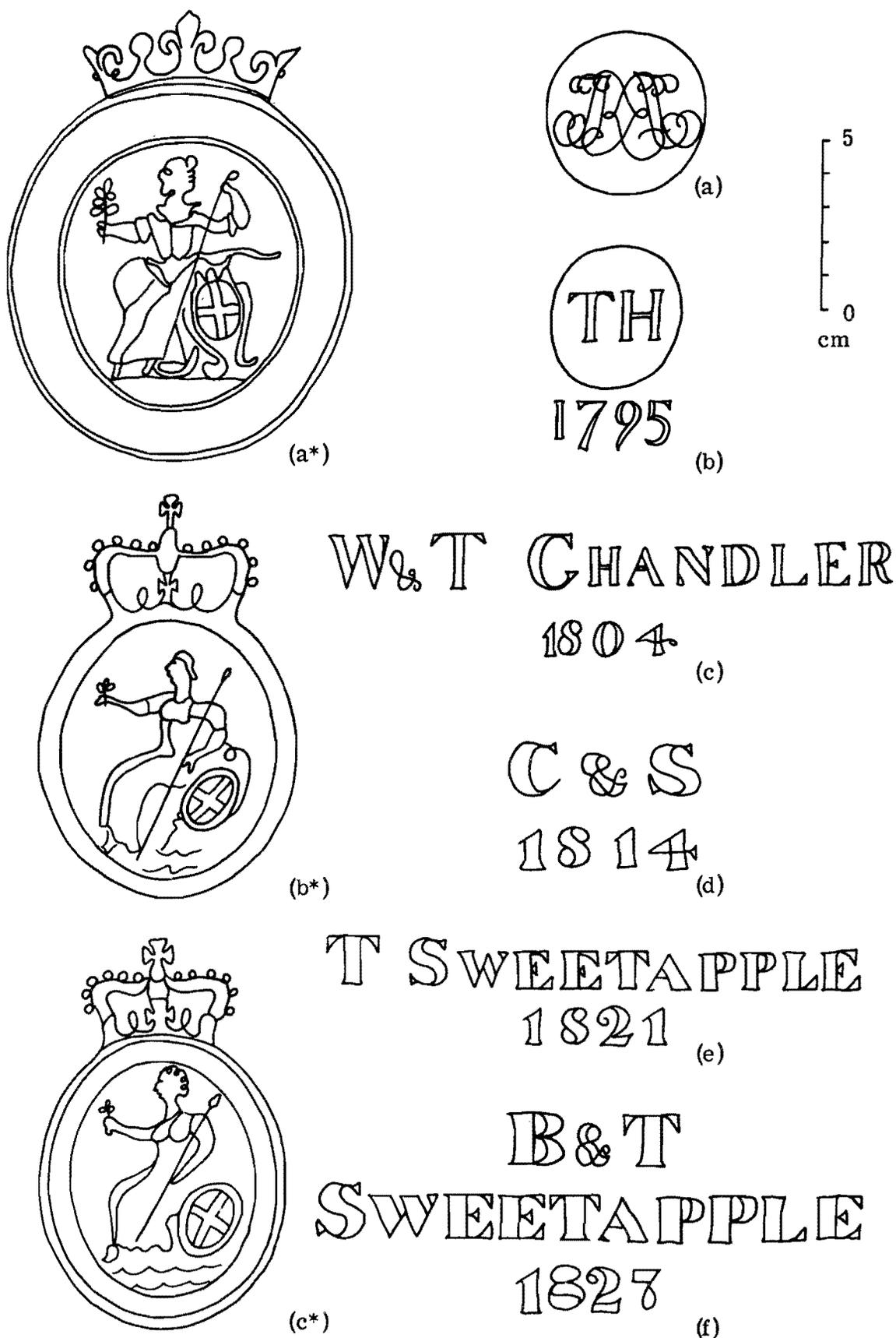


Fig 4 Watermarks in paper made at Catteshall by (a) John Knight? (b) Thomas Harrison? (c) William and Thomas Chandler (d) William Chandler and Thomas Sweetapple (e) Thomas Sweetapple and (f) Benjamin and Thomas Sweetapple. The figures of Britannia (a\*), (b\*) and (c\*) are associated with (a), (c) and (e) respectively. *Tracings from the land-tax returns (Surrey Record Office, QS 6/7) for Farncombe for 1786(a), 1797(b), 1816(d), and 1821(e), and for Guildford St Nicholas for 1810(c), and from a letter written by George Evelyn of Wotton (Guildford Muniment Room 52/7/79) (f)*

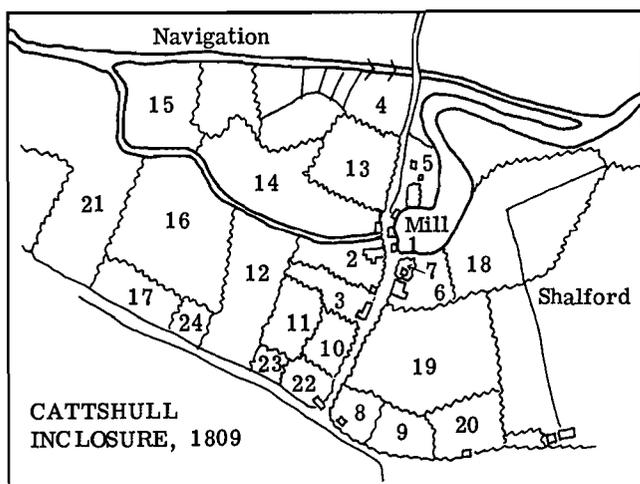


Fig 5 Map of Catteshall based on the Godalming and Catteshall Inclosure Map of 1809. The land was owned by the late John Sweetapple (1–5), John Knight (6), Richard Simmons (7), William Smyth (8–12), William Lee (13–17), James More-Molyneux (18–20), Company of Skinners (21), William Furlonger (22), and James Windebank (23,24).

decreasing from £45, which included £5 for John Knight's house, previously occupied by the Chandlers, to £35.<sup>173</sup> From 1814 to 1817 Chandler and Sweetapple were the papermakers but from 1818 the name of Thomas Sweetapple occurs alone. The watermarks 'W & T Chandler 1804', 'C & S 1814' and 'T Sweetapple 1817' reproduced as Fig 4(c)–(e) are consistent with this information. The Chandlers were of course Mary Sweetapple's brothers and held a half share of the mills.

In 1808 William Swan, William Chandler and Thomas Chandler, acting as trustees, had insured their 'Movable Utensils and Stock in Trade in their Water Corn Mill, House, Brick and Timber Built and Tiled, situate in Cateshall for £1,000. Warranted there be no Steam Engine or Kiln'.<sup>174</sup> These three trustees are also recorded in a Catteshall manor rental of this period.<sup>175</sup> A lease of 1829 states that the Sweetapples purchased an undivided moiety of the mills from William and Rebecca Chandler.<sup>176</sup> The latter was presumably Thomas Chandler's widow and it seems that the sale occurred in 1817. Meanwhile according to the poor-rate books John D. Sweetapple & Co took over the corn-mill in 1811, the rateable value increasing from £33 to £60.<sup>177</sup> This probably indicates that both the mill and the Blockhouse had been extended. In the previous year John Sweetapple had become tenant of the slip of land upon which stood the flourhouse, the annual rent being 10s payable to the Navigation Commissioners.<sup>178</sup> He became one of the trustees of the lower division of the road from Kingston-upon-Thames to Sheetbridge, Hants, which was approved by an act of 1823.<sup>179</sup>

As they were Quakers the Chandlers and Sweetapples refused to pay church-rates and military-rates. Accordingly some of their property was confiscated in lieu of payment and they were fined. These penalties were recorded in the Society of Friends' 'sufferings' books which provide fascinating information (Plate 4).<sup>180</sup> Thus in 1793 John Sweetapple had to give 7 quarters of barley worth £11 14s and in 1797 William and Thomas Chandler of Guildford 3½ sacks of flour worth £7. In 1802 a pepper-castor, 2 pairs of candlesticks and 3 silver spoons were taken from Thomas Chandler. Three years later Mary Sweetapple had to provide flour, wheat, corn and hay worth in all over £100. In 1805 William and Thomas

Chandler had flour taken and also 5 reams of paper worth £5 17s 6d. John D. Sweetapple is first mentioned in 1810 when eight sacks of flour worth £36 were taken but as he only owed £21 one sack was returned. In 1814 flour was confiscated from J.D. and Benjamin Sweetapple and paper from William Chandler and Thomas Sweetapple. Pots, pans, candlesticks, an iron boiler, soap, a tea kettle and a mahogany tray were collected from Mary Sweetapple in 1818 and 1820. The last Sweetapple entry is for 1828 when both flour and paper were taken.

During 1824 it appears the paper-mill was rebuilt, for in that year its place in the poor-rate books was taken by a storeroom of rateable value £3.<sup>181</sup> An advertisement of 1832 in the *Reading Mercury* states that 'the Paper Mill was substantially erected in 1824–26, arranged with much judgement and containing every improvement with 10 hp steam boiler and all the apparatus for working three vats capable of manufacturing the finest paper'.<sup>182</sup> When it re-opened in 1825 the rateable value had increased from £35 to £50 and John D. Sweetapple & Co were running both the paper and corn-mills. However a year later the three Sweetapple brothers John, Thomas and Benjamin paid the poor-rates jointly and then from 1827 only Thomas and Benjamin were involved. The watermark given in Fig 4(f) dates from this period. It reads 'B & T Sweetapple 1827' and occurs in fine white writing paper used by George Evelyn of Wotton, a relative of the diarist.<sup>183</sup> In a lease for a year dated 1829, by which Jane, one of the four Sweetapple sisters, conveyed her seventh part of the property to Thomas Mellersh of Godalming, Benjamin was said to be a mealman of Godalming, Thomas a paper-manufacturer of Catteshall and John Downham a gentleman of Catteshall.<sup>184</sup> The land-tax records confirm these changes but it is not clear why they occurred.<sup>185</sup>

Benjamin and Thomas Sweetapple soon ran into difficulties and in December 1830 they were declared bankrupt. In the following March the assignees asked the creditors for permission either to carry on the business or to sell the property.<sup>186</sup> In July 1832 Henry Moline paid the poor-rates for the corn-mill. The rateable value, which had previously been £60, dropped to £48 presumably because Moline was not occupying the Blockhouse, rated at £12. In October 1832 the rate for the corn-mill was reduced to £33. However the assignees continued to pay the rates on the rest of the property until the commissioners paid a final dividend in October 1834. Then Thomas Sweetapple took over the paper-mill, the poor-rate having been increased from £50 to £60 in 1833.<sup>187</sup> It thus seems that the mills had been sold following the 1832 advertisement in the *Reading Mercury* and that Moline and Sweetapple had taken leases on the corn- and paper-mills respectively.

Henry Moline belonged to another family of Quakers. Indeed Robert Moline, who was a Godalming banker, was with William Chandler the most prominent Friend associated with the building of a new meeting house at Guildford in 1803.<sup>188</sup> His name occurs frequently in the sufferings book from 1794 until his death in 1834.<sup>189</sup> Henry Moline was probably his son and is recorded in the same book during the period 1826–9. When he took over the corn-mill he applied successfully to the Navigation Commissioners 'for a reduction of the toll on flour loaded at Catteshall landing place from 1s 5d to 1s 3d being the same reduction of toll as was lately made to Messrs Holland in respect to their mill at Unstead within the same reach'.<sup>190</sup> He only stayed at Catteshall for a few years and in 1839 was described as a miller of Church St, Godalming.<sup>191</sup> By 1845 he was at Unstead Mill, and stayed there until at least 1864.<sup>192</sup> Unstead Mill was 2 km downstream from Catteshall and was newly erected in the 1830s, being located on the Navigation rather than the river.<sup>193</sup>

In September 1836 an application was made 'to divert the highway from Catteshall to Bramley via Catteshall Mills'.<sup>194</sup> The new highway was said to be 126 ft shorter than the old 'and much more commodious to the public inasmuch as there is a ford or stream to pass through on the Old Highway but which inconvenience is avoided by a Bridge on the proposed new Highway'. It was stated that use of the old highway had for some time been discontinued as the owners had allowed the public to use the new highway, a private way through the mills. The owners were William, Thomas and Joseph Haydon, bankers, of Guildford, who must have bought the mills following the Sweetapple bankruptcy. Part of the plan which accompanied the application, which was successful, is reproduced as Fig 6. The 'Old Highway' passes through the tail-water of the mills and is clearly the road referred to in the enclosure award. This plan is of particular interest in that it provides a detailed outline of the mill buildings. These form a continuous range on the downstream side of the proposed new highway and not three separate buildings as indicated on the enclosure map (Fig 5). The Blockhouse is also now shown as a rectangular building rather than the irregular structure marked earlier. These changes must reflect the rebuilding work of 1810 and 1824.

In reality of course the proposed road diversion was not for the benefit of the public but to enable the owners to extend the mill buildings even further, to accommodate a new paper-making machine which was to supplant the old methods which had been in use at Catteshall since about 1660. These developments were also to oust corn-milling from the site. Thus the industrial revolution had finally arrived at Catteshall but before describing the resulting developments an account will be given of the tan-yard which had been established adjacent to the mill.

## TANNING

### The Twycross Family 1813–1843

In 1813 John Knight sold his house at Catteshall (6 on Fig 5) to Richard Twycross, one of the family of leather

manufacturers at Westbrook Mill.<sup>195</sup> The previous ownership of this property is rather involved. It had belonged in 1739, when the land-tax was 18s, to Richard Denyer. He left his house and malthouse in 1746 to his son Thomas, who in 1755 demised the property for 1,000 years as security for £150. Thomas, described as a maltster of Godalming, died in 1768 and left the property to his son Henry, another maltster. In 1777 Henry, described as an innholder of Godalming, contracted to sell the property to John Knight. However before the conveyance was executed Denyer died intestate leaving as his co-heiresses at law his sisters Elizabeth and Sarah Denyer, both of whom were lunatics and incompetent to convey the premises. Meanwhile in 1768 the mortgage of 1755 had been transferred to John Hicks, a tanner of Gosden Common, and in 1779 Hicks brought a successful Ejectment in Kings Bench to obtain possession of the premises. At this time John Knight and his father were bankrupt. However in 1783 Knight, using money bequeathed to his wife and children by James Hedger his father-in-law, paid Hicks £227 7s, covering the mortgage in full with interest, but no assignment was made. This led to further difficulties until Knight sold the property to Twycross, who was described as a leather dresser, for £472 10s.<sup>196</sup>

The rate-books record that from 1813 to 1820 Richard Twycross held a house and fell-mongers yard at Catteshall (a fell-monger being a dealer in animal skins). The rateable value was £6 and the land-tax 16s. In 1820 Charles Twycross took over the property and in 1825 paid poor-rates for the first time on a tanyard rated at £5 which had been built in the garden.<sup>197</sup> The following year he acquired the adjacent property known as Rolls (7 on Fig 5). The 'Widow Smither' had paid 4s land-tax for Rolls in 1739. Robert Rolls left it to his son Robert in 1751 and he or another Robert Rolls sold it to Richard Simmons in 1794. Simmons, who had previously been one of the occupants of the Blockhouse, immediately mortgaged the property for £60 to John Worsfold, and in 1810 Worsfold and Simmons conveyed the property to George Barrett. Finally in 1826 Simmons and Barrett's executors transferred it to Charles Twycross and H. Marshall.<sup>198</sup> The rateable value was then £5 and the land-tax still 4s. After 1833 John Twycross took over the tanyard but Charles Twycross continued to occupy John

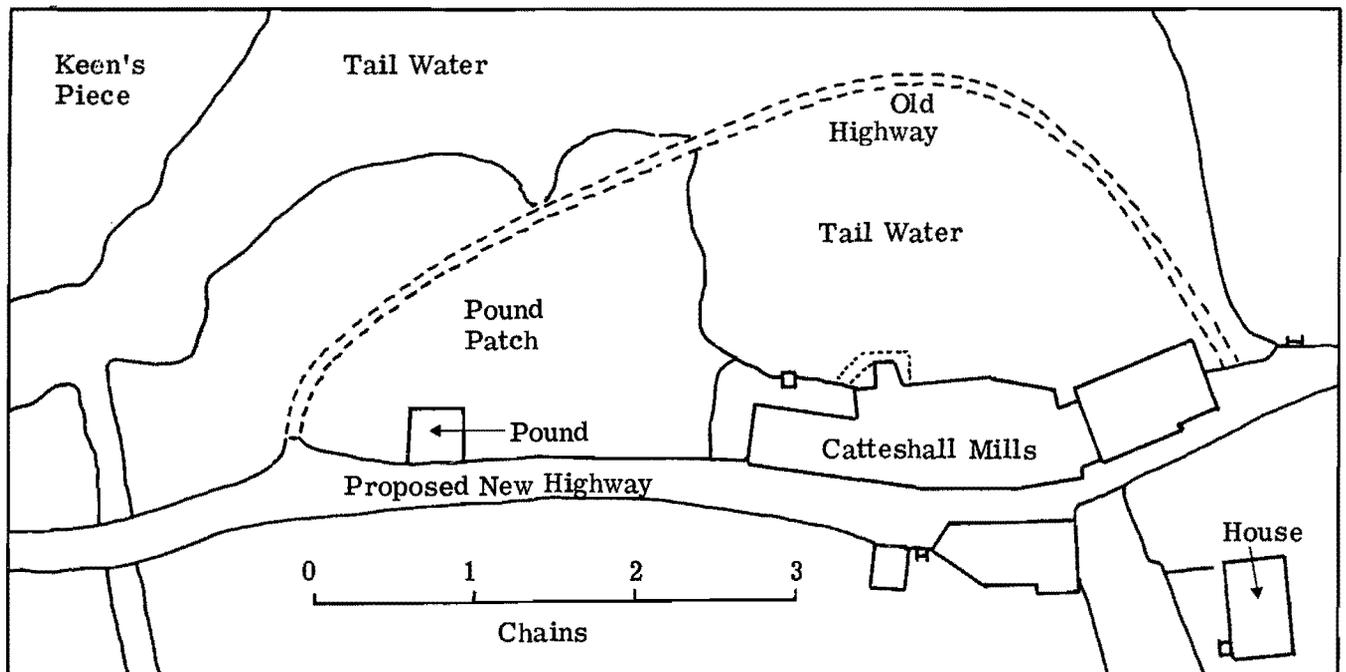


Fig 6 Catteshall Mills in 1836. Based on a plan accompanying an application to divert the highway from Godalming to Bramley (Surrey Record Office QS 5/8/130)

Knight's former house, with John, who from at least 1794 had run the leather-mill at Westbrook, as his landlord.<sup>199</sup> In 1831 while the Sweetapples were bankrupt, Charles Twycross took over the tenancy of the slip of land adjacent to the flourhouse, the rent payable to the Navigation Commissioners increasing from 10s to 20s per annum.<sup>200</sup>

John Twycross died in 1840 and two years later his Catteshall property was offered for sale.<sup>201</sup> Knight's house and the tanyard were subject to a 1,000 years lease commencing in 1755 when Thomas Denyer mortgaged the premises. The house contained two parlours, a kitchen, brewhouse, pantry and cellar, and four bedrooms. There was a paved yard, stabling for four horses, a cattle shed, a straw house and a good garden. Rolls' House was described as a freehold cottage in two tenements with garden in the occupation of Moon, tenant at will. Immediately adjoining the gardens and contiguous with the navigable River Wey was the tanyard with 46 pits, a drying shed 45 ft by 24 ft, bark and leather stores, a coal room, beam house, lime pits and octagonal millhouse with cast iron bark-mill, curb and floor, and a drying loft 30 ft by 15 ft on brick quoins with a cart shed under. These features clearly illustrate the main processes of tanning. After being washed the skins were soaked in the lime pits to loosen remaining fat and flesh and then taken to the beam house where they were thrown across a convex table known as the beam for dehairing and fleshing with curved two-handled knives. The skins were then sectioned or rounded and suspended in a series of pits containing tanning liquor. This liquor was prepared from dried oak bark ground to a powder in the bark-mill and then soaked in water for several weeks. After further cleaning the tanned skins were then processed and dried on racks in darkened rooms with adjustable weather boards which ensured good ventilation. It is interesting that the Catteshall tanyard was very similar to the Rhaeadr Tannery which has been re-erected at the Welsh Folk Museum, Cardiff. This has 50 pits and a bark-mill operated by a water-wheel. The mill at Catteshall was probably powered by horses.<sup>202</sup> A much larger tanyard with over 600 pits in all was located nearby on Meadrow.<sup>203</sup>

In fact the property was not sold in 1842. In that year Charles Twycross was still the occupier,<sup>204</sup> and in 1843 it was assigned to Elizabeth Twycross.<sup>205</sup> The deed records that Richard Woodger the elder and John Lambert had occupied the cottage before Robert Rolls and that John Moon and James Powell were recently tenants. It also states that Richard Jarman and H. Marshall were associated with the property. By 1863 the site was owned by Jarman and Sarah Marshall and contained 17 houses known as Jarman's Catteshall Cottages.<sup>206</sup> These survived until 1968 when they were demolished to make way for a new housing development.

By 1840 the Twycross family had also left Westbrook Mill,<sup>207</sup> where they had produced oiled rather than tanned leather.<sup>208</sup> John, William, Charles and finally Richard had all been involved at Westbrook.<sup>209</sup> It seems that Richard 'was not fortunate in his business having in his later years to work in the trade instead of continuing as proprietor. He had 5 or 6 stalwart-like sons who were somewhat a terror to the Townspeople'. He also had a strange brother who styled himself Sir Isaac and lived in a house covered with shells near Westbrook Mill.<sup>210</sup> Richard Twycross died aged 92 in 1874.<sup>211</sup>

## THE INTRODUCTION OF MACHINE-MADE PAPER

### Thomas Sweetapple 1836–1868

In December 1838 Thomas Sweetapple patented his invention of 'An Improvement or Improvements in the

Machinery for Making Paper'.<sup>212</sup> The invention was for use with a Fourdrinier machine which makes paper in continuous rolls rather than in single sheets. The first successful machine of this type was built in 1803 by Bryan Donkin at his engineering works in Bermondsey and by 1838 over 100 had been installed in English paper-mills.<sup>213</sup> In Donkin's machine the paper pulp or stuff flowed from a vat on to the horizontal surface of a revolving endless web of woven wire at the end of which it was taken as a continuous sheet of paper, through presses, around a series of drying cylinders and finally reeled. Sweetapple's invention consisted of one or more rectangular troughs of copper, brass or other material bolted to the machine so that the upper edges of the troughs were level with the upper surface of the moving web of wire. The arrangement is illustrated in Fig 7 which is taken from part of a sheet of drawings accompanying the specification. When the machine was working the troughs filled with water so that the fibres in the pulp settled more slowly than usual on to the web and, Sweetapple claimed, became interlaced more effectively, thus producing better paper. For very thin paper, made from stuff with long fibres, one trough 13 inches wide was said to be sufficient but for thick paper, made from short coarse fibres, two such troughs were recommended. The invention, which became known as a forming trough or forming board was adopted by Bryan Donkin and was very successful.<sup>214</sup> By 1843 it was being sold to paper-mills in Germany and troughs identical with those in Sweetapple's patent drawings were still being used in Australia in 1953. Other paper-making developments at Catteshall also interested Donkin and in 1839 his son Harry obtained details of the recipes and procedures which Sweetapple used for engine-sizing and bleaching. A full account of this information has been published<sup>215</sup> and reveals that the size was boiled using steam rather than fire and that there were three bleach chests made of 3 in yellow deal and measuring 12 ft long, 5 ft 6 in wide and 3 ft 8 in deep. The width of the paper produced was about 55 in and the average quantity made in twelve hours was 50 reams of 20 lb demi.

Thomas Sweetapple's paper-making machine was probably installed in 1837. Certainly no machine is mentioned in the advertisement of 1832 and Sweetapple was bankrupt until October 1834. It seems likely that the machine was in fact located in a new building constructed following the official closure in 1836 of the Old Highway through the mill-tail. This new building was sited between Sweetapple's house and the mill. It is clearly shown on the plan annexed to the Godalming tithe apportionment of 1844, a section of which is shown in Fig 8.<sup>216</sup> Later more detailed plans indicate that this building housed a water-wheel.<sup>217</sup> The tithe map also suggests that since 1836 the existing mill-building had been extended to the south-east so that it stretched right across the mill-tail. The extension therefore blocked the 'Old Highway' and its construction explains the owners' application to divert the route.<sup>218</sup> The butt-ended interface between these old and new sections was still clearly visible in 1978, but the detached building, which probably housed the first paper-making machine, was demolished in about 1871.

The 1841 census returns record that Thomas Sweetapple and his wife Susan, aged 48 and 35, had seven children, William, Edward, Margaret, Alfred, Ellen, Jane and Henry aged 10, 9, 8, 6, 4 and 2 respectively. Ten paper-makers or paper-mill workers were living at Catteshall, only three of whom were born in Surrey. One of these was Thomas Harrison son of the former tenant of the mill. Other paper-mill employees lived at nearby Farncombe and probably worked at Catteshall. The ages ranged from 20 to 85. Two of Bryan Donkin's sons Henry, a paper-maker, and Thomas, an engineer, were living at Meadrow.<sup>219</sup>



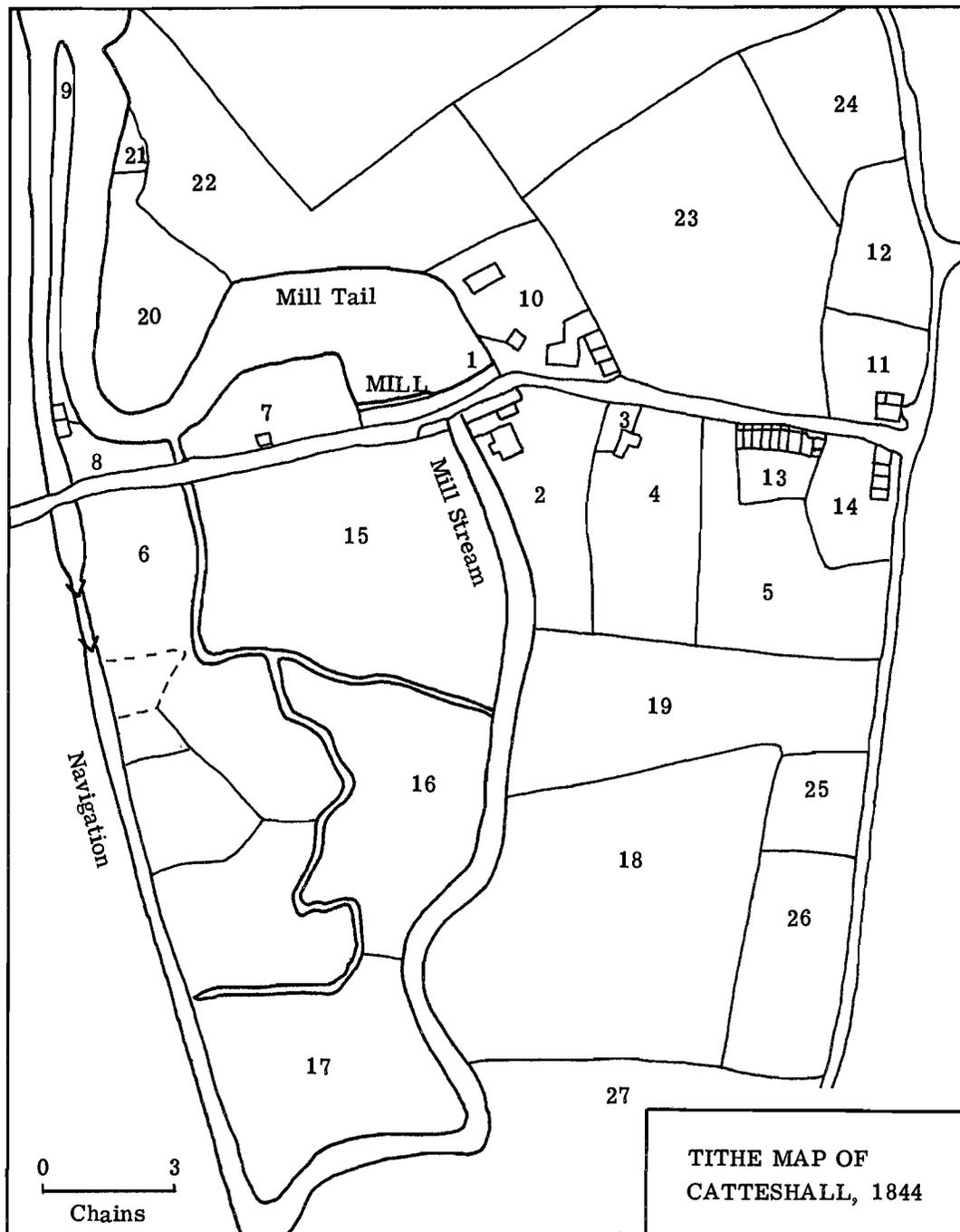


Fig 8 Catteshall and its surroundings, 1844. The land was owned by the Haydon family (1-7), the Navigation Commissioners (8, 9), Charles Twycross (10), William Holland (11, 12), Hannah Edwards (13), George and Job Smallpiece (14), Ann Sumner (15-18), George Marshall (19-24), James Windebank (25), the Lee family (26), and the Company of Skinners (27). *Based on the Godalming tithe apportionment and map (Surrey Record Office)*

height throughout the week.<sup>229</sup> It was claimed that the millers upstream from Godalming were at fault in drawing their ground-gates at week-ends rather than allowing the water to pass over the waste-gates. Hence the mills downstream had insufficient water on Mondays. Both Thomas Sweetapple, who paid £5 of the £20 subscribed to the Association's funds, and Edward Sweetapple served on the Committee. Mr Sweetapple's name appears in the minute books of the Commissioners of the Godalming Navigation during this period in connection with his rental of the slip of land at Catteshall Bridge.<sup>230</sup> The old flourhouse on this land had been pulled down in 1855 and the timber sold to Messrs Moon and Son for £7 5s.

In about 1863 J.W. Penfold prepared a survey of Godalming based on the tithe award. His notebooks state that Haydon was the owner of Catteshall Mill and Thomas Sweetapple the occupier. In addition they contain a detailed but nearly illegible description of the mill which may be interpreted as follows: 'Rag House ground floor . . . store. Rag dusting Rag boiling horizontal — store room. 2 floors and bleaching room below. 3 engines 1 cwt . . . 4, 1 cwt each. pumps — 1 small bleaching engine. 2 Breast shot wheels. Chestroom machine room by Donkin. Cuts machine by Chortley. Large double steam boiler for beating cylinder and rag boiling only. Large rag stores, large finishing salle and 2 large floors over and carpenters shop'.<sup>231</sup> Much of this is self explanatory. The rags for paper-making were stored, sorted, cut, dusted, boiled, bleached and converted into pulp or stuff in beating engines. The stuff was then transferred to chests and hence fed on to the Fourdrinier machine which was manufactured by the Bryan Donkin Co. The Penfold survey also states that Thomas Sweetapple's house had '4 good bed and 2 small cellars' and it gives the names of the occupiers of Jarman's Catteshall Cottages built on the old tanyard site opposite. The census returns for 1861 show that Thomas Sweetapple employed 55 work-people. Most of the labourers were women, particularly young girls and widows.<sup>232</sup>

The 1860s were difficult years for paper-makers as there were insufficient rags to meet the demands of the industry.<sup>233</sup> In particular there appear to have been problems at Catteshall. When it first appeared in 1860, the *Paper Mills Directory* recorded Thomas Sweetapple at Mill No 382, Catteshall. This was the number under which the mill was registered for the excise duties which were paid by paper-makers up to 1861.<sup>234</sup> In 1862 Catteshall Mill is not mentioned in the *Directory* but two years later it is included under 'English Mills not Working under a Mill Number' and is said to be making 'Printings'. Thomas Sweetapple's name appears in the *Directory* for the last time in 1865. There is then a gap of two years before 1868 when No 382 is restored and John Edward Spicer is said to be making 'Fine Printing Papers'.<sup>235</sup> In 1863 the Navigation Commissioners' minutes record the opinion that 'Catteshall Bridge would safely bear the steam engine proposed to be carried over it by Mr Sweetapple, he having engaged to remove it in a timber carriage'.<sup>236</sup> It is not clear however whether the engine was being taken to or from the mill.

Although the Sweetapples had left Catteshall Mill by 1868 several members of the family continued in the paper-making business. By 1870 Thomas Sweetapple's son Thomas, who was born in 1842, was manager of Eashing paper-mill and he remained there until 1889.<sup>237</sup> Edward Sweetapple was in 1864 the paper-maker at Hurstbourne Mill near Whitchurch, Hants, which had previously been operated by Spicer and Co of nearby Alton, but in December of that year he was declared bankrupt. He then became manager of a mill in Kent before moving in 1881 to Allen Wood Mill near Carlisle. In 1893 with Thomas and Harold Sweetapple and four others he formed The Sweetapple United Paper Mills Co

Ltd with mills at Cockermouth, Workington, Bootle, Newcastle-upon-Tyne and Carlisle. The Company failed and within a year he was again bankrupt.<sup>238</sup>

Some recollections of the Sweetapple family were recorded towards the end of the 19th century by Charles Softley, a crippled Godalming gossip and poet.<sup>239</sup> In particular he knew Mary Sweetapple, her sons Thomas and James (John Downham) and three of her daughters who remained Quakers and wore plain clothes and quaint bonnets. He states that Thomas built the row of cottages leading to the Ram at Catteshall and that the last daughter died aged 82 (in 1885). He also knew Thomas Sweetapple junior who, with the rest of the family, left the Godalming district when Eashing paper-mill closed.

## THE NEW PAPER FACTORY

### The Spicer Family I 1868–1878

John Edward Spicer was making fine printing papers at Catteshall in 1868.<sup>240</sup> The Spicer family had made paper at Chipping Wycombe in Buckinghamshire as early as the 17th century but in 1796 moved to Alton Mill in Hampshire which is on the headwaters of the northern branch of the River Wey. There John Edward Spicer founded a new and very successful paper-making business. He took his sons Henry, John Edward, William Revell and James into partnership and when he died in 1845 the firm became known as Spicer Brothers. In 1865 James Spicer broke away to start a new firm of stationers in London and in 1868 the remaining brothers acquired the lease of Catteshall Mill where they installed three of Henry's sons, Henry, Arthur and Herbert, and John Edward's son Henry Revell.<sup>241</sup> Whereas Alton Mill had always produced hand-made paper, it is clear that the intention from the start was to use Catteshall Mill to make machine-made paper. Spicer Bros Ltd moved to Eynsford, Kent in 1909 but the old mill buildings including extensive shuttered drying lofts still exist at Alton. In 1922 Spicer Bros Ltd and James Spicer and Sons Ltd reunited to form Spicers Ltd but significantly the commemorative booklet issued by the firm at the time makes no mention of the Catteshall Spicers.<sup>242</sup>

The Spicers had ambitious plans for Catteshall Mill. In July 1869 the Godalming Navigation Commissioners' minutes record that Messrs Spicers required to draw down the water at the mill for a month, probably because they were replacing the old water-wheels by a new water-turbine.<sup>243</sup> Certainly a turbine had been installed by 1873 as in March of that year Spicers complained to the Commissioners that the level of their tail-water was being kept too high because flashes had been fixed to the top of the waste-gates at Unstead Lock, downstream of Catteshall. ' . . . the loss of a foot fall on our turbine wheel is equivalent to a loss of 12 horse power, by no means a small matter with the present price of fuel'. A month later they concluded a second letter as follows: 'Be good enough to give this your earliest attention as the loss to us is fully 20 horse power which at the present price of coal is ruinous'. As the head of water available at Catteshall is about 6 ft it is likely that the turbine in question was capable of generating about 50 hp. A MacAdam outwards flow Fourneryon turbine dating from this period and of this capacity still survives at the mill. It is in good condition and is larger than any other water-turbine of this type known to exist. It is described in detail below (page 31). The first edition of the 1/2500 Ordnance Survey map, which was surveyed in 1871, shows two large square reservoirs opposite the mill.<sup>244</sup> It is likely that these were constructed by Spicers at about the same time as they installed the turbine.

Spicers purchased the freehold of Catteshall Mill and the other land formerly occupied by the Sweetapples in two lots on 12 January and 28 July 1870.<sup>245</sup> On 30 May they applied to the Court of Quarter Sessions for the County for permission to divert the highway past the mill. The owners of the property were stated to be Henry, Arthur, Henry Revell and Herbert Spicer, and the application was accompanied by a detailed plan of the proposed diversion and also of the mill buildings, the house opposite and the neighbouring Jarman's Cottages (Fig 9).<sup>246</sup> This plan shows that the mill was already much larger than in 1844 (cf Fig 8). The extensions, which were at the north-west of the older buildings, involved moving the manor pound from the location shown in Figs 5, 6 and 8 to a site adjacent to the canal and a letter of 8 April 1870 from Arthur Spicer to Mrs Marshall, who held Catteshall manor, shows that Spicers were responsible.<sup>247</sup> In October 1870 the Navigation Commissioners enquired whether new buildings erected by Messrs Spicer were on Navigation property and discovered that they were not.<sup>248</sup> It is thus clear that the extensions can only just have been completed when the road diversion application was submitted. The division of the mill into various rooms on the plan was reflected in the buildings standing in 1978. The plan also shows two buildings opposite the mill which had to be demolished to make way for the new road. The one on the left bank was shown on the enclosure map of 1811 (Fig 5) but the other, which clearly had a water-wheel fed by its own leat, had been built following the earlier road diversion of 1836 but before the tithe survey (Figs 6, 8). It could have housed Thomas Sweetapple's first Fourdrinier machine. The house had also been extended since 1844. The 1/2500 Ordnance Survey map of 1870-1 shows the same features as the road diversion plan but in less detail. The only interesting difference is that the mill-tail appears to be partly filled in.<sup>249</sup>

By 1870 the Catteshall paper-making business was known as A. Spicer & Co.<sup>250</sup> It seems therefore that Arthur Spicer was the leading figure, although it was his brother Herbert who lived in the house opposite the mill. By 1873 Henry and Henry Revell no longer appear to

have been involved but Henry Revell's half-brother Frederick is named together with Arthur and Herbert in the *Return of Owners of Land* compiled in that year. At that time the gross estimated rent for the land occupied by the mill was £266 13s.<sup>251</sup> From 1871 Herbert wrote frequent letters to his fiancée Martha Arnott whom he married in June 1873. These letters survive in private hands and provide a fascinating insight into Herbert's character and also a little information about the mill. On 18 October 1872 he wrote 'I had not been in the mill ten minutes last night before we had a very nasty accident which nearly sent one or two of us to the 'happy hunting grounds'. It has shut us down all today'. On 21 April 1873 he described a house which Arthur was thinking of taking as 'pure Gothic' and 'near perfection'. He states that he will put an ornamental balustrade on the stairs of his own and Mat's (Martha's) house 'something like what I put in the steam engine house here'. Two days later he says that he is cutting the wall of the dining room away to make the room larger.<sup>252</sup> The resulting bay-window survived until 1978 but the balustrade does not seem to have materialised.

Herbert Spicer's reference to Gothic architecture and a steam engine house are interesting as one of the buildings on the site appeared at first to be a Victorian-Gothic chapel. However careful inspection revealed that it was designed to house a beam engine. In particular one wall had an original arched opening which accommodated the line shaft linked to the water-turbine and two heavy transverse beams were built into the side walls just below the eaves. In contrast to the decorative roof timbers these clearly had a functional purpose, and a plan of the mill prepared in about 1878 indicates that it contained a 78 hp engine.<sup>253</sup> In 1906 it was referred to as 'the old beam engine house'.<sup>254</sup> It had a window with a keystone dated 1872 and was built projecting from the rear of the mill buildings on the right bank of the stream, partly over the section of the mill-tail that had recently been filled.

The Spicer family were keen Congregationalists although Herbert Spicer's letters to Martha suggest that he was not particularly religious himself. It is interesting

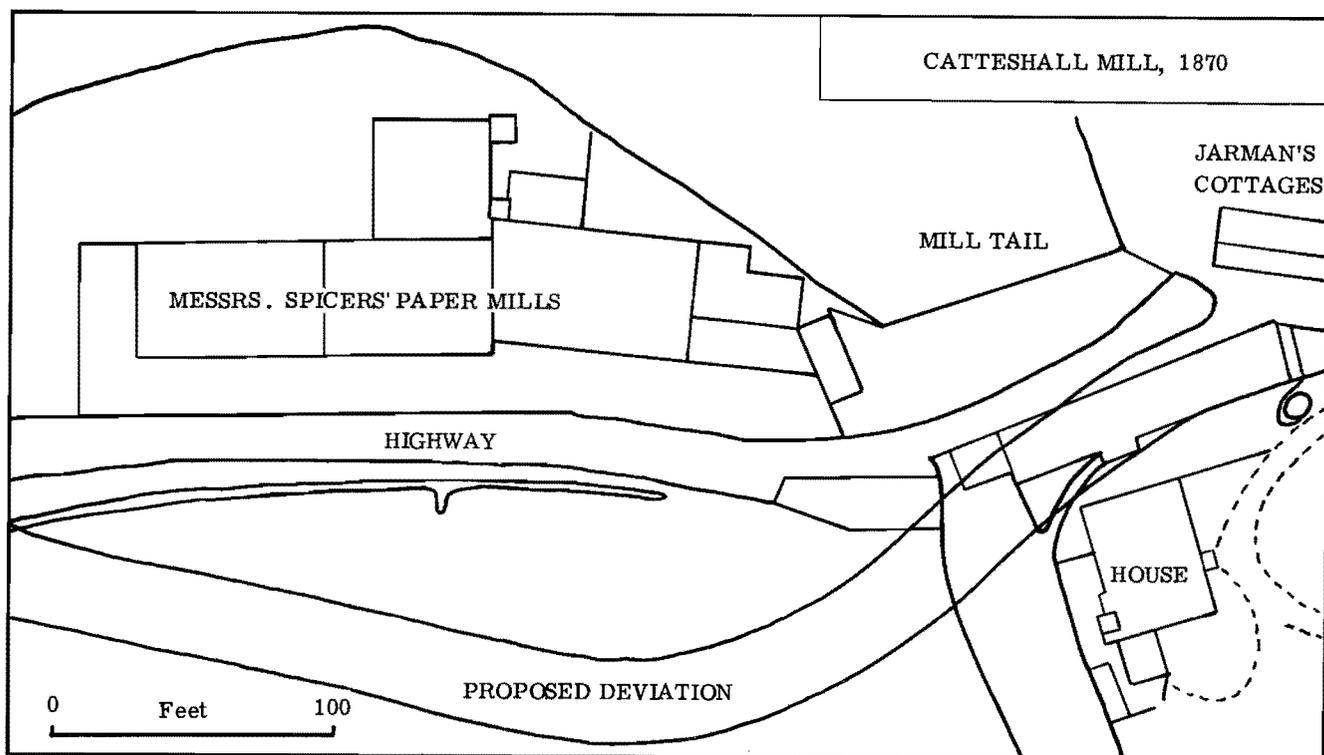


Fig 9 Catteshall Mill in 1870. Based on a plan accompanying an application to divert the highway alongside the mill (Surrey Record Office QS 5/8/340)

however that in 1875 Spicers purchased a plot of land at the corner of Catteshall Road and Meadow and 'an iron erection of a chapel' and a coffee tavern were built on this site.<sup>255</sup> The chapel was known as the Mission Hall and from 1889 ministers from the Evangelization Society held services there.<sup>256</sup> The building still exists, forming part of the Godalming Naval Club. The coffee tavern is now known as Teknis House.

The reason why Spicers applied in 1870 for permission to divert the road past the mill was that, like Thomas Sweetapple and the Haydons in 1836, they wished to extend their premises. The new road was completed by 1874<sup>257</sup> and a plan, which probably dates from 1878, shows the ensuing extensions.<sup>258</sup> This plan, the main features of which are reproduced in Fig 10, gives an indication of the use of each room of the earlier buildings together with a schematic representation of the associated equipment. At this time the mill was making paper from the traditional raw material, rags, and the first satisfactory alternative, esparto grass. Between 1861 and 1887 the annual amount of esparto grass imported into England from Spain and Tripoli increased from 16 tons to over 200,000 tons and Catteshall was certainly using it by 1868 when a barge-load was included in the Navigation records.<sup>259</sup>

A detailed examination of the 1878 plan (Fig 10) shows that the rags were stored and sorted at the west end of the factory and that the esparto grass was cleaned in an adjacent room using a willowing machine. The raw materials were then transferred to eight esparto and rag boilers or kiers and boiled in a liquor of caustic soda to remove fatty, glutinous and colouring matters. The steam for these kiers was produced in the adjacent boiler house which previously had housed four boilers but was apparently being doubled in size. The pulp was then separated from the liquor in the washing engine house and bleached

using a chloride of lime solution to reach the condition known as half-stuff. It was then drained and transferred by lift to 12 beating engines or Hollanders where it was ground and treated with further chemicals, colour and size to produce the final pulp or stuff. These beating engines were driven by two steam engines of 78 and 40 hp and also by the water-turbine which was immediately below them. The stuff was then transferred to two stuff chests and hence pumped on to the Fourdrinier paper-making machine which was driven by a separate engine. Finally the paper was moved to the Salle where it was cut, stacked and packed ready for distribution. It is interesting that paper-makers pronounce Salle as if it were written 'Sol' as marked on the plan.

The extensions on the plan are mainly shown unoccupied but a long rectangle clearly indicates the proposed location of a second paper-making machine. In a letter to Martha dated 13 June 1878 Herbert Spicer writes that they are starting a new machine and that the men want a rise in wages for operating it.<sup>260</sup> The *Paper Mills Directory* states that in 1875/6 the mill had one machine, in 1877 one 90 in machine and in 1878 two machines of 76 in and 96 in.<sup>261</sup> No doubt one of these was the earlier machine measured differently. The wall between the two machines which is stated to be 'now removed' on the plan was in fact replaced by a row of cast iron columns (Plate 28). The new range of buildings at the south end of the site is seen to house a 70 hp engine apparently related to the new paper-making machine and a 300 hp engine with an adjacent fly-wheel house. The facade of these buildings which is shown in Plate 13 is the most striking architectural feature of the factory. The Spicers clearly recognised this and proudly displayed their family crest in brick relief on the exterior of their new beam-engine house (Plate 14). The crest is from the arms of Nicholas Spicer of Exeter which were recorded in 1620 (Fig 11).<sup>262</sup> Com-

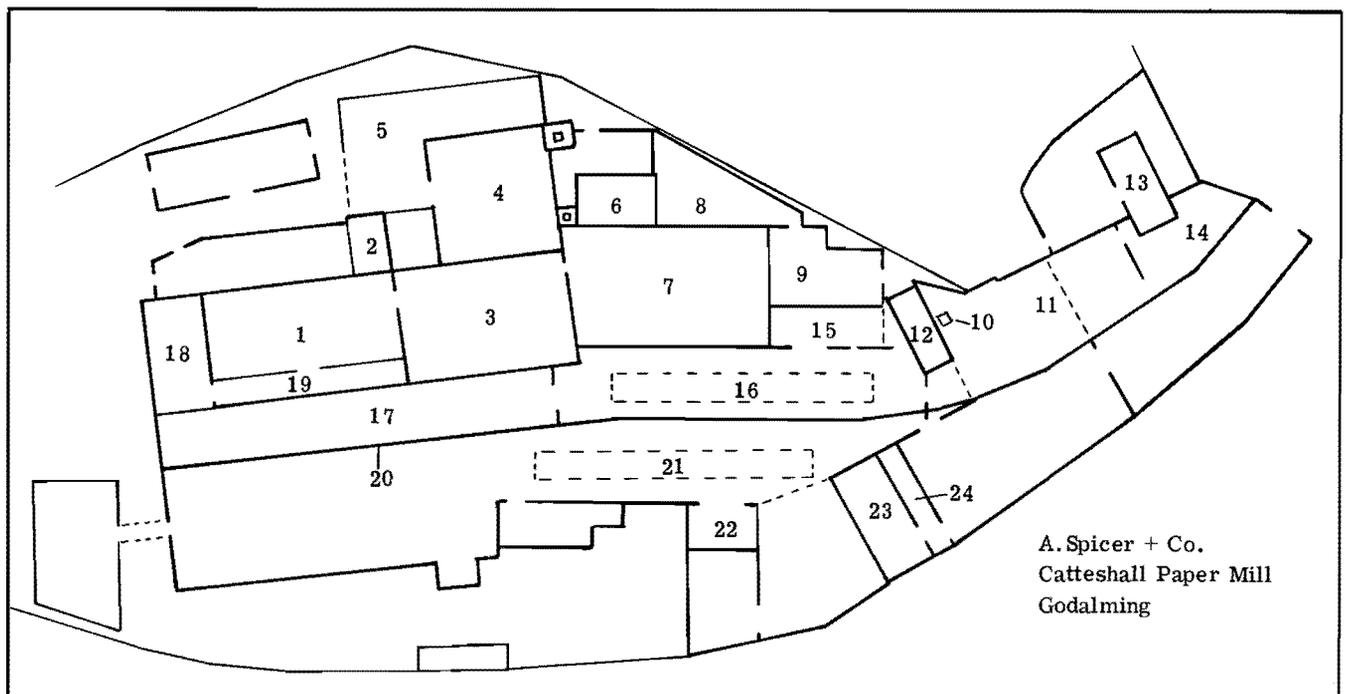


Fig 10 Catteshall Mill c1878. Based on a plan in the possession of Wiggins Construct Ltd (Catteshall).

The following features are labelled on the original plan, the information in brackets being shown diagrammatically: rag store and sorting house (1); willowing machine (2); esparto and rag boiling house, corrugated iron roof (eight boilers) (3); boiler house, four boilers (4); four boilers (5); liquor house (four vats) (6); washing engine house, water tank, engine (four large and four small washing engines) (7); bleaching houses (8, 9); lift (10); beating engine house (12 engines) (11); 40 hp and 78 hp engine houses (12, 13); engineers shop (14); two stuff chests, engine (15); paper machine with pumps (16); sol house (17); sol (18); paper store (19); this wall now removed (20); (new paper machine) (21); 70 hp engine (22); 300 hp engine (23); fly-wheel house (24).

parison of the 1878 plan (Fig 10) with the 1870 road diversion plan (Fig 9) shows clearly that further extensions had been or were being made at the rear of the premises. These include the 78 hp engine house together with an adjacent building and part of the boiler house. The Spicer plan for developing a large paper factory at Catteshall had clearly come to fruition.

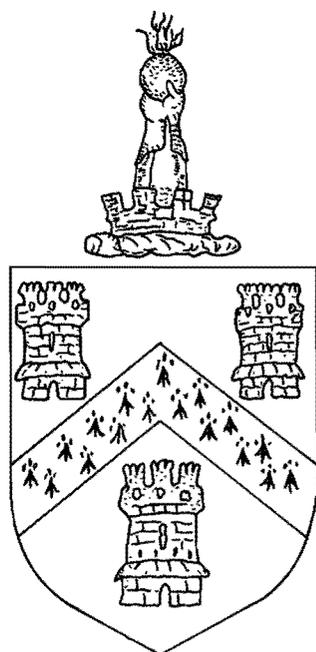


Fig 11 Arms borne by Nicholas Spicer of Exeter. Arms: Sable, a chevron ermine between three towers triple towered or. Crest: Out of a mural crown a cubit arm vested and gloved, holding a fireball, all proper. The crest appears in brick relief on the Main Beam-Engine House of the mill (Plate 14).

boilers at Catteshall Mill exploded scalding nine people, five of whom died on the following day.<sup>267</sup> The boiler was one of six made of cast iron under the Spicers' direction in 1870. When it exploded hot chemical liquid and about three tons of esparto were ejected into the boiling room. This was the same room as that which contained eight kiers or boilers on the plan of 1878 (Fig 10). This is clear from reports of the explosion, which state that the room in question provided the main way between the picking or sorting house and the poaching or washing engine house. The reports also reveal that over 400 workers were employed at the mill at this time. The five people killed were William Smith (24 years), Andrew Frank Foster (22) a labourer, John Brazell (42), Alice Bennett a young girl, and Samuel Sheppard, foreman of the grass-pickers, who had been injured previously by machinery at another paper-mill. Smith was buried at Guildford cemetery on 1 January in the presence of a large concourse of people. The others were interred in the same burial ground on the following day. The hearse containing Sheppard was preceded by about 80 members of the Farncombe branch of the Ancient Order of Foresters and followed by about 50 girls and women employed under him as grass-pickers. Over a thousand people congregated at the cemetery but 'the best of order prevailed, the police arrangements being carried out by Mr Dep. Chief Constable Barker'.<sup>268</sup>

At the ensuing enquiry it was claimed that the explosion was caused by the workmen blocking an escape pipe leading to a safety valve with straw and rags in order to stop hot drips falling on them. All witnesses denied doing this and stated that the boilers were normally considered harmless. There were also doubts about whether the boilers were inspected regularly. They were about nine feet in diameter, eight feet deep and had dish shaped ends; the depth had been increased by four feet in 1876-9. It was found that the cast iron plates from which the exploded boiler had been made were in places only  $\frac{1}{4}$  inch thick rather than  $\frac{1}{2}$  inch as claimed. The boilers were designed to work at a pressure of 1 psi but were supplied with steam from a Lancashire boiler worked at 20 psi. The safety valve should have ensured that the pressure in the esparto boiler did not exceed 2 psi. It was concluded that cast iron was unsuitable for these boilers and that in future malleable iron should be used.<sup>269</sup> Two separate coroners' inquests were held as two of the deaths occurred in Godalming and three in Guildford. Following several adjournments the Godalming verdict was that there was not sufficient evidence to show the cause of the explosion but a rider stated that there was carelessness on the part of those whose duty it was to see to the boilers. The Guildford verdict was that the explosion was due to the stopping by straw of the exhaust pipe leading to the safety valve. Arthur and Herbert Spicer were said to have done their utmost to relieve the sufferings of the wounded and scalded persons and with George Porteous the works manager and George Marchant, who had been foreman of the mill for 13 years, gave evidence at the inquests.<sup>270</sup> In June 1884, 23 tons of old iron was taken by barge from the mill to Guildford Foundry. This was followed two years later by a further 43 tons.<sup>271</sup> By 1887 new high pressure boilers operating at 80 psi for straw and at 45 psi for esparto were being used.<sup>272</sup>

Catteshall was one of the first paper-mills to attempt to produce chemical wood-pulp by means of the sulphite process.<sup>273</sup> This method was developed successfully by a Swedish chemist Ekman and first used at the Ilford Mills near London in 1879. In 1884 the Ekman Pulp and Paper Company erected large mills at Northfleet, Kent in order to exploit the process. A serious problem with producing this type of chemical pulp was that the liquor, which was a solution of bi-sulphate of magnesia, was very corrosive and could not be contained in iron vessels. Ekman overcame this difficulty by using containers with a special

## A SERIOUS EXPLOSION AND POLLUTION PROBLEMS

### The Spicer Family II 1878-1888

In 1878, when the second paper-making machine was installed at Catteshall, the *Paper Mills Directory* records that A. Spicer & Co were making fine printing papers, newsprint, elephants (sheets 28 in by 23 in), and engine-sized writings (writing paper sized by adding rosin to the pulp in the beating engine<sup>265</sup>). In the 1880 edition 'elephants' was deleted but it was recorded that the mills were powered by 'steam and water'. During this period the Navigation freightage diaries provide interesting information about raw materials, particularly esparto grass, being taken to Catteshall Mill and waste materials, especially esparto roots and ashes, being taken away.<sup>264</sup> Much of the esparto waste was sent to Woking paper-mill. Wood pulp was first delivered to Catteshall Mill in August 1883 although Woking Mill had been using it since 1873. This was mechanical pulp, obtained by grinding timber, and resulted in weak paper with no lasting qualities.<sup>265</sup> The Catteshall pulp was probably treated by chemical means to produce a fibrous material which was far more suitable for paper-making. Unfortunately the corresponding railway freightage records for this period do not appear to have survived.<sup>266</sup>

On 28 December 1883 one of the esparto grass pressure

kind of brick lining.<sup>274</sup> Catteshall Mill was using the Ekman process before 1885, and probably in 1883 when wood-pulp was first delivered by barge. However they had little success with the method and abandoned it in 1887 when nearly 200 tons of the remaining raw material, rock-stone or magnesite, were taken by barge from Catteshall to Ekman's mills at Northfleet.<sup>275</sup>

A further difficulty with the sulphite process was that no technique of saving the waste products had been discovered.<sup>276</sup> The method was thus uneconomic and led to pollution problems. This may have been the reason why Spicers gave up the process. Certainly in 1886 they modified their procedure for discharging effluent into the River Wey but in the following March the Guildford Rural Sanitary Authority still instigated proceedings against them. Both the Authority's Medical Officer of Health and Spicers' had samples of water from the mill analysed but could not agree whether or not they were seriously polluted. Arthur Spicer gave evidence at the resultant enquiry and stated that he had been anxious for years to prevent pollution. He had for example spent nearly £1,000 erecting steep tanks and had installed new high pressure straw and esparto boilers which reduced considerably the soda content of the effluent. The firm wished to have an arrangement so that they could admit effluent to the proposed drainage works of the Godalming Main Sewage Board but the Board were not favourably disposed to this suggestion. At the conclusion of the evidence the Local Government Board Inspector adjourned the inquiry on the understanding that Spicers would construct within three months two settling tanks each to hold 140,000 gallons and arrange to discharge the effluent from these tanks into the sewers of the Drainage Board or prepare 2½ acres of their own land as a filtering area.<sup>277</sup> The 1/2500 Ordnance Survey maps reveal that additional filter beds were constructed between 1871 and 1895. The report of the inquiry also provides valuable information about the raw materials used weekly by the mill. There were 60 tons of esparto, 36 tons of oat straw, 10 tons of Norwegian wood, a ton of rags, 6 to 8 tons of caustic soda, 8 to 9 tons of chloride of lime, 5 tons of alum, 2 tons of vegetable size, 9 to 14 tons of china clay, 1½ tons of hyposulphite of soda and 5 cwt of colouring. In addition 17 pints of sulphuric acid and 40,000 gallons of water were used each day. Between 400 and 500 people were employed and they made about 62 tons of paper per week.

During this period at least four members of the Spicer family were associated with Catteshall Mill: Arthur and Herbert, their younger brother Walter and their cousin Frederick.<sup>278</sup> At first Arthur lived at Weygate House on the Portsmouth Road but by 1882 had moved to Woodlands, a house at Hambleton said to have belonged to William Cobbett. Herbert lived until 1883 at the Mill-house which at about this time became known as the Grange. He then replaced Arthur at Woodlands. Walter lived at Meadow House on the main road at Farncombe from 1874 until 1880 when he moved to Taminish Lodge nearer to Godalming. He died aged 32 in 1886.<sup>279</sup> Frederick was at Meadow House in 1880 but by 1886 appears to have occupied the Grange.

## TECHNICAL INNOVATIONS AND FINANCIAL PROBLEMS

### Herbert Spicer 1888–1898

In June 1888 the Spicer Catteshall business was converted into a limited company registered as H. Spicer & Co

Ltd.<sup>280</sup> It had a nominal capital of £225,000 and Herbert Spicer was appointed managing-director at a salary of £1,000 a year.<sup>281</sup> At first the new company was successful but at the second annual general meeting shareholders were concerned that the profits for the year were only £15,000 and not £21,000 as anticipated in the prospectus. This was despite the fact that 270 tons more paper had been produced than in the previous year. Wages had increased from £14,000 to £21,000 in just one year and £8,000 had been spent on new equipment. The increased cost of coal, 250 tons of which were being used each week, was also a problem and it was stated that the chemical scheme, presumably a new attempt to make chemical pulp, was unlikely to be a success.<sup>282</sup>

Early in 1890 Herbert Spicer purchased from Osman Bey, Grand Chamberlain to His Majesty the Sultan of Turkey a concession for 50 years to establish paper-mills in that country. A company registered as The Ottoman Paper Manufacturing Co Ltd was then promoted with Herbert Spicer as managing director. However in November 1891 this company failed and as a result in July 1894 Herbert Spicer was declared bankrupt. Because of this he had to relinquish his post as managing director at Catteshall, but became manager instead at the same salary. In November 1894 he applied to the London Bankruptcy Court for an order of discharge which was granted subject to the minimum suspension of two years.<sup>283</sup>

During the early years of H. Spicer & Co Ltd the Navigation records provide further interesting information. On 4 September 1889, for example, Spicers asked William Stevens, manager of the Wey and Godalming Navigations if he would dredge the mill-tail.<sup>284</sup> The work was started with two boats on 1 October and by 20 December over 2,000 yards of gravel had been removed. The purpose of this must have been to allow barges to load and unload directly at the mill and not at Catteshall or even Godalming wharf. Esparto grass was still being delivered but the main raw material was now dry wood pulp. The barges used were *Perseverance*, *Thameside*, *Industry*, *Reliance*, *Hope*, *Lighter*, *Alert* and *Wey*.<sup>285</sup> There are no records of coal being delivered by barge and presumably it was brought by train and cart. Wood pulp was also at times delivered by rail.<sup>286</sup>

Despite the bankruptcy of Herbert Spicer the firm continued to pursue modern developments at Catteshall. In the early 1890s a tandem gas engine of 400/500 hp was installed but apparently did not come up to expectations.<sup>287</sup> The first fully successful gas engine, the earliest form of internal combustion engine, had been built in 1876. The largest in 1881 was 20 hp but 5,000 hp models were available by 1917.<sup>288</sup> It appears that the mill produced its own gas in a gas-house on the opposite side of Catteshall Road.<sup>289</sup> The location of this building is shown in Fig 13. It was replaced by a motor house or garage between 1906 and 1910.<sup>290</sup> In 1896 a Viscose Syndicate was formed including Mr A. Pears of Godalming who had conducted trials on the use of viscose or viscose cellulose at Catteshall Mill.<sup>291</sup> Viscose is the material from which cellophane paper and rayon are produced. The trials had been abandoned by 1897.<sup>292</sup> In the same year an advanced electric light system was installed.<sup>293</sup> It used a Holmes 'Castle' dynamo powered by either a gas engine, a steam engine or both together. The dynamo, which was housed in a special match-boarded and glazed enclosure at the end of the salle,<sup>294</sup> was fitted with a heavy fly-wheel because of the unsteadiness of the gas engine. In the machine house, engine house, beater houses and all parts of the mill where there were chlorine fumes, lead covered cables attached to insulators were used and the lamps and their holders were hermetically sealed in airtight globes. Herbert Spicer was said to be perfectly satisfied with the system.

Thus Herbert Spicer was still very much involved at Catteshall Mill and was clearly looking forward to a more prosperous future. In reality however the mill was passing through a bad period. In 1894 there had been serious floods and the mill had been cut off for pedestrians.<sup>295</sup> Herbert had not anticipated the problems that flooding could bring when he wrote to Martha in November 1872 'I shall be able to tease you to any extent in Winter for when the floods are out you won't be able to run off'.<sup>296</sup> In December 1896 it was rumoured that H. Spicer & Co Ltd proposed relinquishing the mill and that it would be taken over by Herbert Spicer and a few friends.<sup>297</sup> It seems that shareholders for several years had been dissatisfied. The machine formerly used for engine-sized writings and fine printings was idle and about half of the employees were out of work. Others had their wages reduced. Management changes were made in 1897 and when in February 1898 there were again complaints about the effluent from the mill polluting the River Wey, Godalming Borough Council discovered that the premises were occupied by a different company, known as Herbert Spicer & Co.<sup>298</sup> The new firm was involved in May 1898 in a claim for damages by a 17 year old employee who had a finger amputated following an accident. He was awarded three years wages: £85 16s.<sup>299</sup>

By October 1898 the firm of Herbert Spicer & Co had failed but H. Spicer & Co Ltd still held the freehold of the site.<sup>300</sup> Herbert himself left the scene and in 1901 went to the West Indies to prospect the West Caicos Islands for the growth of sisal or hemp. He purchased the freehold of the islands for £14,000 and traded there as the West Caicos Sisal Co. However by 1904 he had only paid £5,000 of the purchase price and was again declared bankrupt. The proceedings reveal that in 1902 he obtained a concession from the Turkish Government to acquire gold and silver mines in Asia Minor and that he still held an option to purchase paper-mills on the Bosphorus. No reliable value could however be placed on these assets.<sup>301</sup> Herbert Spicer was certainly a flamboyant character and exciting developments had occurred while he was associated with Catteshall Mill.

## THE FARNCOMBE PAPER CO LTD

### J.A. Nordberg and D. Robertson 1898–1907

When Herbert Spicer left Catteshall in 1898 the paper-mill was closed throwing about 150 people out of work.<sup>302</sup> One of these was James Dick, a mill-wright who had worked at the mill for 56 years.<sup>303</sup> It is striking that in a period of 12 years the labour force had been reduced by a factor of three. By March 1899 Herbert Spicer's creditors led by Mr J.A. Nordberg were intending to form a new company to run the mill under the name of the Spicer Manufacturing Co Ltd. However Herbert's elder brother Edward Spicer, who was chairman of the original family firm Spicer Bros Ltd, heard of the proposal and reported it to his Board, which included Edward's cousin and brother-in-law Augustin and his sons Edward Samuel and Henry Gage.<sup>304</sup> The Board objected to the use of 'Spicer' in the name of the proposed company as no-one called Spicer was connected with the firm and the title Surrey Paper Mills was then proposed. The new company was to overhaul the equipment and to effect improvements for the production of wood-pulp papers.<sup>305</sup> Indeed Nordberg seems to have been an authority on wood-pulp.<sup>306</sup> However the mill did not re-open immediately and in September 1899 the Godalming Sanitary and Drainage Committee offered 10s per ton for 150 tons of slack coal

belonging to the mill trustees and lying at the Old Station.<sup>307</sup> Two months later a company with a capital of £14,000 was still in course of formation, the principal backer being Col Sartorius, a director of the old company and also of some paper-mills in Portugal.<sup>308</sup> Finally on Christmas day 1899 a lease for 42 years was granted by H. Spicer and Co Ltd, who still held the freehold of the property, to the Farncombe Paper Co Ltd.<sup>309</sup> This was an appropriate title for the firm as during the 19th century the premises had developed almost entirely on the Farncombe rather than the Catteshall side of the mill-stream which forms the boundary of these two parts of Godalming. The rent for the first seven years was £500, the next seven years £750 and the remaining 28 years £1,000. Although it does not seem to have operated at Catteshall, Surrey Paper Mills Ltd was registered as a company and was not finally dissolved until March 1906.<sup>310</sup>

The mill does not appear in the *Paper Mills Directory* for 1900 and 1901 but in 1902 the Farncombe Paper Company were stated to be at Farncombe Mills making engine-sized cream laids, fine printings, news, music, cartridge, tinted, litho and super-calendered papers. There were two machines 76 and 96 inches wide, the mill was powered by water and steam and the output was 80 tons per week. However by January 1903 the company had failed and the mills were in the hands of Duncan Douglas Robertson, an accountant who was appointed receiver and manager.<sup>311</sup> Business continued but in May 1903 Robertson reported that there were no surplus assets available to meet the claims of the unsecured creditors. He proposed to reconstruct the company and estimated that the mill should earn £5,000 per annum.<sup>312</sup> Again business continued and on Christmas morning 1903 a game of football was played between a team representing the office and staff of the mill and a team called 'The Black Squad'.<sup>313</sup> A member of the mill team, Goodall, was apparently not only a footballer but also a would-be businessman as in May 1904 he issued a circular advocating the formation of a new company to buy out the receiver.<sup>314</sup> This new company did not however materialize. At this time the business was valued at £22,000 but Robertson failed to find a purchaser. Thus on 25 August 1905 he was directed by the Chancery Court on his own application to close the business and realise the assets. About 100 people were thrown out of work, the main reason for closure being increases in the cost of wood-pulp.<sup>315</sup>

Robertson spent nearly a year clarifying the affairs of the company and finally on 27 July 1906 the leasehold of the mill together with the manager's house and grounds and the stock, stores and materials were auctioned.<sup>316</sup> However there was only a small attendance, no-one made a bid for the mill and a number of lots of stock etc were withdrawn.<sup>317</sup> The advertisements of this auction provide brief but interesting information. For example the stock etc included 60 tons of white paper (fine writings, printings and cartridges), 30 tons of wrappers, four new machine wires, 37 dandy rolls, 17 new brass rolls, new and old felts, driving ropes, a large quantity of rubber, leather and patent belting, engineers tools and stores, a dynamo, weighing machines, piping, ironmongery, three tons of brass castings, 20 tons of scrap iron and a quantity of old lead.<sup>318</sup> Catalogues of this material were available but appear not to have survived. Fortunately however a proof copy of the leasehold sale particulars for the mill itself still exists. These give the size and structural characteristics of each part of the factory including three paper stores, the boiler house and its associated chimney shaft, wood-pulp warehouse, hydraulic press packing house, washing engine house, bleach mixing house, water tank house, bleach draining house, beating house, main beam engine house, stuff chest, felt washing and machine engine house, machine house, guillotine cutting house,

cutting and reeling house and salle, offices, engineers smiths and carpenters shops, fitting and pattern shops, old beam engine house, and latrines. On the opposite side of the road were the manager's residence, two stables, other outbuildings, the sluice gates and a gas house.<sup>319</sup> The plan which was advertised with the sale particulars<sup>320</sup> has unfortunately not survived but it has been possible to interpret most of the available information. The buildings are largely those which are shown on the plan of 1878 (Fig 10), the only major alterations being associated with changes of raw materials. Thus the rag store and sorting house and the esparto and rag boiling house of 1878 have been replaced by paper stores and a wood-pulp warehouse by 1906. The 78 hp engine house has become the old beam engine house and the unlabelled rooms around it in Fig 10 are occupied by smiths, pattern and engineers fitting shops. In 1978 the engineers shop still housed a large lathe which is illustrated in Plate 27. It had a swing of 5 ft 8 in and a gap of 16 ft between its centres, and was manufactured by Crookes-Roberts & Co of Sheffield in 1881. The other unoccupied space of 1878 is accounted for by extensions to the beating engine and machine houses and to the salle. The proposed extension to the boiler house does not appear to have materialized.

The 1906 sale particulars also contain a list of equipment part of which is reproduced in Fig 12. It includes two paper-making machines, fifteen washing and beating engines, two new patent beating engines, five bleaching towers, a set of super-glazing calenders, two paper-cutting machines, a slitting and reeling machine and the electric light installation. The motive power consisted of four 120 lb Lancashire boilers with a 240 tube economiser, a 400 hp compound condensing beam engine, other steam engines and a water turbine. The turbine and steam engines are discussed in detail below (pages 31 and 33). It seems clear that the 300 hp engine of 1878 had been altered by the addition of a high pressure cylinder and hence upgraded to 400 hp.<sup>321</sup>

Because the auction of 1906 was unsuccessful Robertson could not meet his debts and filed his own petition in the London Bankruptcy Court.<sup>322</sup> It transpired that in his capacity as receiver Robertson had filed accounts every six months in the Court of Chancery. Thus all his activities were sanctioned by the Master of that Court and all his liabilities had arisen through his responsibilities in running the Farncombe Paper Co Ltd. The Bankruptcy Court therefore found that his debts were properly incurred and indemnified him for the debts against the company. These included £47 owed to Crookes-Roberts, manufacturers of the large lathe. Eventually on 25 March 1907, Albert E. Reed & Co Ltd took a 42 year lease of the mills at a rental of £500 per annum for 21 years and £750 for the remainder of the term.<sup>323</sup> The freehold was still held by H. Spicer & Co Ltd but in March 1908 this company failed and a receiver was appointed.<sup>324</sup> Twelve months later the Farncombe Paper Co Ltd was struck off the register of joint stock companies.<sup>325</sup> This brought to a close a very unsettled decade in the history of the mill.

## THE FINAL PHASE OF PAPER-MAKING

### Albert E. Reed & Co Ltd 1907–1939

A.E. Reed started in the paper-making business at the age of 14 in 1860 and after running various paper-mills in the West Country and Cardiff acquired Riverside Mills Dartford in 1889. These were later known as London Paper Mills of which he was a substantial shareholder.

Then in 1894 he established his own business at Tovil Mills near Maidstone, Kent.<sup>326</sup> By the time his company was incorporated as Albert E. Reed and Co Ltd in 1903 he had purchased several other paper-mills including Merton Abbey Mills on the River Wandle in Surrey.<sup>327</sup> He continued to expand his interests and in 1907 Albert E. Reed & Co (Newfoundland) Ltd was formed, providing his United Kingdom paper-mills with a major source of wood pulp.<sup>328</sup> On 25 March in the same year Reed took the lease of Farncombe Paper Mills. Among the workmen moved to Farncombe from other Reed mills were Mr Charles Bonner, a guillotiner, and Mr W.G. McKay, later to become head of the Finishing Department, both of whom were previously at Tovil and who were to work for Reeds for over 50 years.<sup>329</sup> According to the local directory A.E. Reed occupied Catteshall Grange himself for four years.<sup>330</sup> A photograph of him taken in 1904 is reproduced as Plate 5. The *Paper Mills Directory*, after recording that the mills were standing idle in 1907, states a year later that they were producing fine news, printings and super-calendered papers using two machines 76 and 96 inches wide.

Following the bankruptcy of H. Spicer & Co Ltd in 1908 the freehold of Farncombe Mills was auctioned on 9 March 1910.<sup>331</sup> However the reserve price of £10,000 fixed by the High Court judge in charge of the case was not reached. It appears that A.E. Reed offered £8,000 and following negotiations was able to purchase the Mills for £9,000. The sale particulars survive and again provide a wealth of information including the earliest available photograph of the mill (Plate 6).<sup>332</sup> The sale involved the mill itself, the reservoirs and associated land on the opposite side of the road, Catteshall Grange and its gardens, the coffee tavern and chapel on the main road and two pieces of meadow land. The locations of these lots are shown on Fig 13 which is based on a plan that accompanied the sale particulars. These state that Reeds had expended very large sums of money in erecting improved buildings and had replaced much of the old machinery by modern equipment of much greater value. Unfortunately however the company declined to allow any schedule of machinery and fixtures to be prepared for the purposes of the sale. Nevertheless by comparing these particulars with the leasehold sale information of 1906 the significant changes can be established. The beam engine was apparently no longer being used and a new horizontal steam engine had been installed in the space previously occupied by the washing engine house. In addition the old boiler house and chimney had been pulled down and replaced by a new brick and corrugated iron building housing four boilers, and a substantially-built square main shaft standing 150 ft high. The various rooms described in the particulars are indicated on the plan of the premises shown in Fig 14. It is clear from this plan that since taking over the mills in 1907 Reeds, taking advantage of the change in raw material from esparto to wood pulp, had rationalized the layout of the factory.

Details are also given of The Grange and its outbuildings including a newly erected motor house, which replaced the earlier gas house. 'Ye Catteshalle Coffee Tavern', said to be 'a picturesque structure specially designed for a Coffee Palace' is also described in detail and illustrated with a photograph. It was let for 30 years from 24 June 1882 at a yearly rent of 1s with power for the landlords to put an end to the term on payment of £2,200, the sum expended on the building. It was sub-let to Mr Amazda Gale for £30. The iron erection of a chapel adjacent to the coffee tavern was said to be capable of seating 150 persons. The particulars stress the proximity of Farncombe railway station but ignore the fact that the premises are on the Godalming Navigation. The importance of the River Wey, passing through two large filter beds, as a source of water for the factory is men-

*The Mill Buildings are equipped with*

## **MODERN PLANT AND MACHINERY,**

Equal to an output of

### **80 Tons of Paper per Week,**

And during the period that the Farncombe Paper Company, Limited, have been in occupation, a sum of upwards of **£18,000** has been expended upon additions, alterations and improvements thereto.

### **The Plant and Machinery**

INCLUDE:—

#### **TWO PAPER MAKING MACHINES,**

106 inches and 85 inches wide on the Wires respectively, with the necessary Stuff Chests, fitted Agitators, Flat Strainers, Stuff, Vacuum and Back-water Pumps, First and Second Press Rolls, Couch Rolls, Wire and Felt Rolls, Drying Cylinders, 4 feet 6 inches and 4 feet diameter respectively, Stacks of Calender Rolls, Reeling Apparatus, Horizontal and Vertical Driving Engines with Shafting and Speed Gear Wheels, and Steam and Water Connections and Fittings.

#### **FIFTEEN WASHING AND BEATING ENGINES,**

From 3 to 6 cwt. capacity each.

#### **TWO NEW TAYLOR PATENT BEATING ENGINES**

Of 1,500 lbs. capacity each, fitted with Cast Iron Towers and Centrifugal Pumps.

#### **TWO CAST IRON AND THREE CEMENT BLEACHING TOWERS,**

Fitted with Centrifugal Pumps, Six Bleach Mixing Chests with Agitators, China Clay Mixers, and Size Boiling Plant.

#### **A SET OF 80-inch 8-bowl SUPER GLAZING CALENDERS,**

Four Cotton and Four Chilled Iron Rolls, driven by a Pair of Horizontal Engines.

#### **TWO PAPER CUTTING MACHINES,**

One arranged for Angle Cutting, with *Tangye's* Horizontal Engine.

#### **A SLITTING AND REELING MACHINE,**

With Independent Vertical Steam Engine.

River and Spring Water, Bleach and other Pumps, Cast and Wrought Iron and Wood Tanks for Fresh Water, Back Water, Bleach, Clay, Alum, &c., Brick-in-Cement Stuff Draining Tanks, Piping, Valves, Connections and Fittings.

Engineers', Smiths' and Joiners' Tools as fitted in Repairing Shops.

Hydraulic Packing Press and Pumps, Guillotine, Steam and Hand Crabs for Lifting, Felt Washer, Weighing Machines and Weighbridge, Salls Tables and Horses for Sorting.

#### **ELECTRIC LIGHT INSTALLATION**

With Dynamo, Switchboard and Connections and the Office Fixtures, Furniture and Fittings.

Fig 12 The plant and machinery of Farncombe Paper Mills as recorded in the leasehold sale particulars of 1906. Based on sale particulars in the possession of Wiggins Construct Ltd (Catteshall).

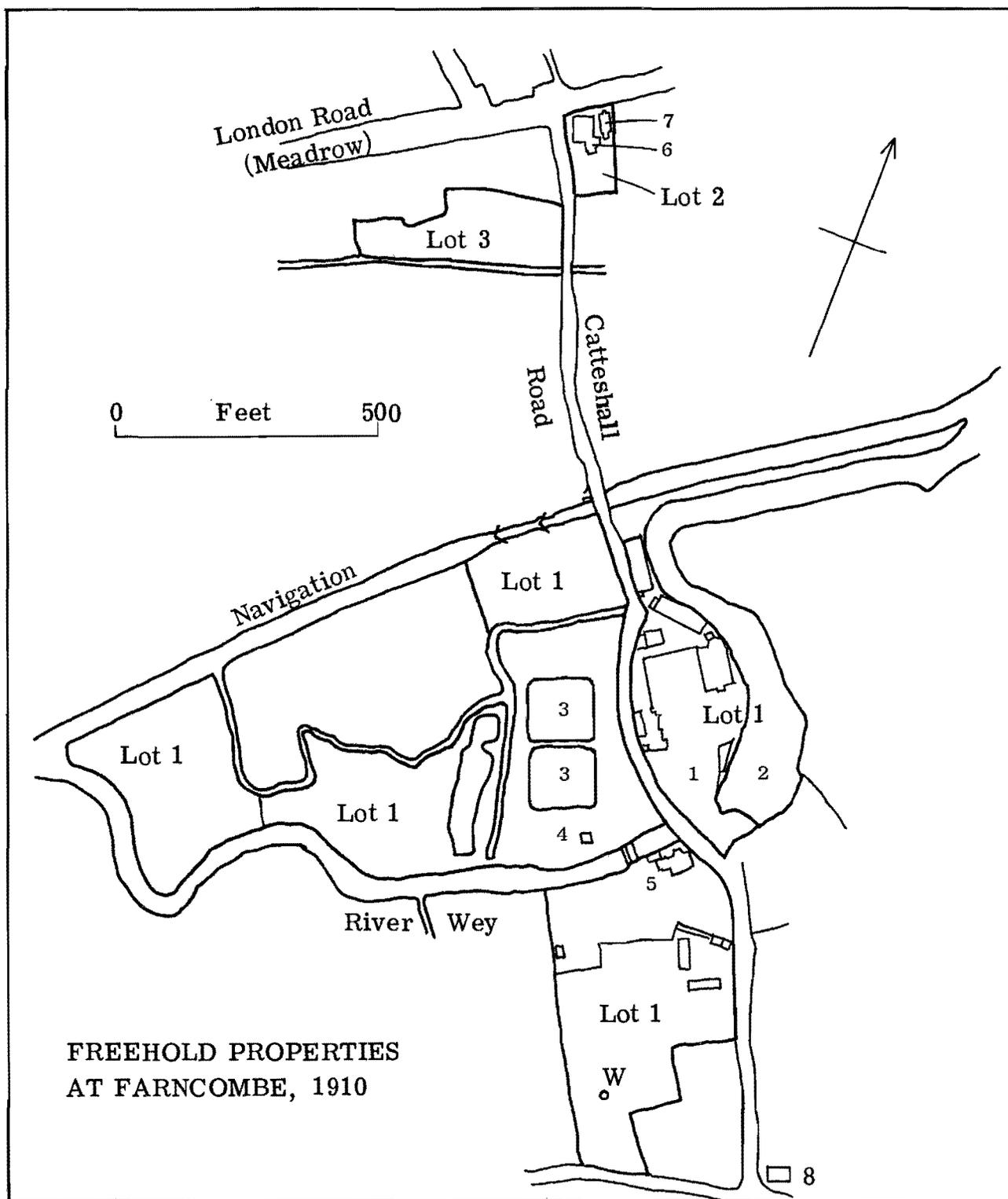


Fig 13 Plan of the freehold properties associated with the mill, 1910. Based on *Sale Particulars in the possession of Reed International*.

Lot 1 consists of the mills (1), the mill pond (2), the ponds (3), the motor-house (previously known as the gas-house) (4) and associated land on the opposite side of Catteshall Road, the Grange (5) and its gardens. Lot 2 includes the coffee tavern (6) and chapel (7), and Lot 3 is meadow land. The house (8) later occupied by the manager of the mills and a covered well (W) are also shown.

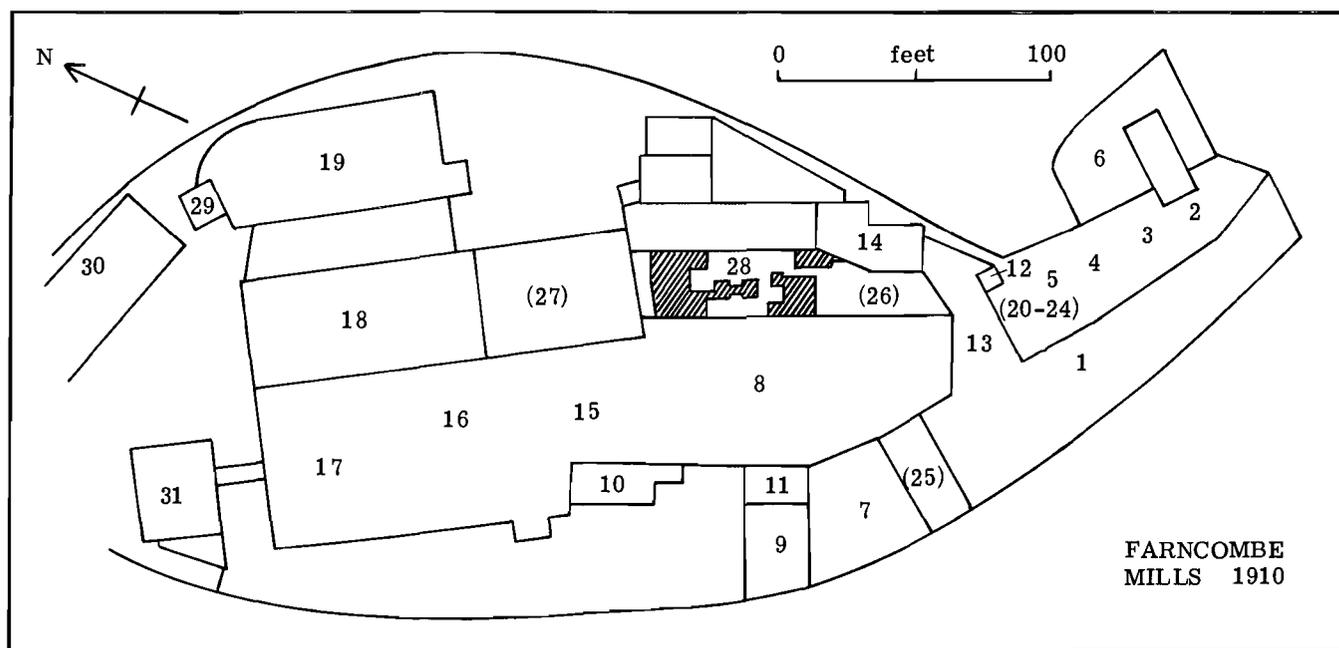


Fig 14 Plan of Farncombe Mills, 1910. Based on Sale Particulars in the possession of Reed International.

The plan shows on the ground floor the entrance and receiving hall 1, a store room 2, a shafting room 3, a motor house 4, the old wheel house 5, engineers' shops 6, stuff chest house 7, machine rooms 8, a felt store 9, the foreman's office 10, an engine room 11, a lift 12, draining rooms 13, the old bleach house 14, the calender room 15, reeler room 16 and finishing room 17, the dry-paper store 18 and the boiler house 19 with the associated economiser house, pump house and coal store. On the first floor are the china clay and other stores (20), the mixing tank room (21), electrical engineers' shop (22), the breaker floor (23), beating machine rooms (24), size making house (25), stuff chest house (26), and paper breaking room (27). The main engine room 28 was approached by steps from the machine rooms. In the yard are the main shaft 29, outbuildings 30 and the detached office buildings 31.

tioned and so is the use of three wells in the grounds of the Grange.

During the early Reed period children started work at the age of 11 and worked a 12 hour shift.<sup>333</sup> On a Saturday in July each year the employees had their annual outing to the seaside.<sup>334</sup> They used to leave Farncombe station before 7 am and after spending the day at Southsea or Brighton arrive home at about 11 pm. In 1912 the *World's Paper Trade Review* records that 'Mr Reed with his usual generosity paid for the train'. The Great War brought problems and in 1916 the mills were partly closed due to Government restrictions prompted by the lack of wood pulp.<sup>335</sup> During the early part of the war Mr G.H. Sleight of Reed's Merton Abbey Mills acted as chief clerk at Farncombe but he left to join the Royal Flying Corps in 1917.<sup>336</sup> After the war he returned to Reeds and eventually retired from the firm in 1954. In 1918 Arthur White became manager. He lived in a house owned by Reeds at the corner of Catteshall Lane and Catteshall Road.<sup>337</sup> It is shown on Fig 13, being the site of The Rose and Crown public house of the tithe map of 1844 and the property known as Gussells which belonged to John Knight the elder in 1778. From 1913 C. Waters occupied Catteshall Grange but during the 1920s it was rented to Alfred Greenfield who was not associated with the mills.<sup>338</sup>

In October 1919 the mills were forced to close for a week due to lack of coal caused by a railway strike. Again Reeds treated their employees well as the workers were paid for this week and the labourers had half pay.<sup>339</sup>

In 1920 A.E. Reed died and his son Ralph succeeded him as Chairman, a position he held until 1954.<sup>340</sup> In the same year Reeds started to construct a new paper mill at Aylesford near Maidstone. It commenced production in 1922 and became the largest paper-mill in Europe.<sup>341</sup> This development clearly indicates the importance of

siting modern paper-mills, using wood pulp as the principal raw material, near ports. Farncombe Mills were obviously badly located in this respect and in fact were finally closed as a paper-mill in February 1928.<sup>342</sup> During the last few years of production Gordon Bridger was the junior clerk at the mill. He was appointed in 1924 and retired from the Company in 1975. His first-hand knowledge of the mills has been invaluable in recording this part of its history. About 150 people were employed during this period. The manager was Mr A. White, the chief engineer Mr W. Quant, the chief chemist Mr C.V. Oliver and the chief clerk Mr H. Winton. Some of the men are shown in Plate 7 on their way by char-a-banc to the first all-mills sports day held at Aylesford in 1926. Farncombe the smallest mill did well, finishing third of the five Reed mills.<sup>343</sup> Approximately 35 of the employees were women and girls who worked in the salle and a studio photograph of five of them, probably taken in the early 1920s, is reproduced as Plate 8. During the General Strike of May 1926 only eight staff remained at the factory and Mr Bridger took the photograph shown as Plate 9 of five of these standing in front of the boiler-house chimney.<sup>344</sup> They were acting as emergency stokers. At this period the machine men were highly paid, receiving about £9 per week, but the normal base rate for labourers was only 11½d per hour.

The *Paper Mills Directory* has essentially the same entry for Farncombe Mills from 1908 until 1929 except that in 1928 'machine finish' is added to its production of 'fine news, printings and super calendered paper'. The paper was used for *The News of the World*, *Autocar*, *Motorcycle*, *Nash's Magazine* and *Star*, for which a reddish tint was added to the pulp.<sup>345</sup> The paper-making machines were said to be 74 in and 96 in wide after 1917 and it seems likely that these were basically the same

machines as those used in the 1870s. The equipment was driven by the steam engine installed by Reeds in about 1908. A plan of the bed of this engine is shown in Fig 14. It was a horizontal engine with twin cylinders and rated at about 500 hp. It had a large grooved flywheel approximately 16 ft in diameter with about ten cotton ropes leading to a large dynamo and a system of shafts. Mr Bridger recalls an occasion when the chief engineer had to work for 48 hrs on this engine without stopping, as new cotton ropes had contracted and pulled the flywheel out of alignment. The water-turbine seems to have been used for maintenance work at week-ends when the steam engine was not running. It was surrounded by many whirling belts driving the beating engines upstairs.

The wood pulp used was brought by two-horse flat carts and coal in one-horse tip carts from Godalming Old Station.<sup>346</sup> This was the original terminal station of the London and South Western Railway which was opened to Godalming in 1849. It was by-passed ten years later, when the line was extended to Portsmouth, and became a goods-yard. The pulp was imported seasonally and was stored in buildings at or near the station. It is probable that plans to erect a temporary building in Hallam Road adjacent to a house owned by Reeds and occupied by the chief clerk were for this purpose.<sup>347</sup> The paper produced was again taken to the station in carts. However during the 1920s the chief engineer bought two ex-army lorries and started to deliver the paper direct to its destination. There were also recurring proposals to build a new wharf at the mills and make use of the Navigation again, but these never came to fruition. The ponds opposite the mills were no longer used as settling tanks as this was not necessary now that the paper was made from wood pulp and not esparto grass. The land around the tanks was used as allotment gardens and for pig-sties and the area had a reputation for being foul-smelling. There were also complaints about smoke and grit from the mills but the Godalming Sanitary and Drainage Committee were satisfied that the owners were doing all they could to mitigate the nuisance.<sup>348</sup> Flooding was still a problem. During high floods the employees had to be brought from the main road by horse and cart and the office staff had to sit with their feet on the rungs of their chairs to avoid the water on the floor.<sup>349</sup>

In February 1926 Reeds had Farncombe Mills valued by the firm of auctioneers who sold them the lease in 1907.<sup>350</sup> It appears that they were considering selling the mills because, as the economic depression of 1929–1934 approached, they became short of orders for their new and prestigious Aylesford plant. Eventually in February 1928 the Farncombe orders were transferred to Aylesford and, despite some experiments to produce novel heavy paper which approached card in quality, the mills closed. The Farncombe workers were naturally very resentful about the closure. About two dozen were moved to other Reed mills and a few maintenance staff remained at Farncombe, but over a hundred were thrown out of work.<sup>351</sup> Mr Bridger was transferred to Aylesford but returned regularly to Farncombe until 1936 to pay the maintenance men. In 1932 the possibility of re-opening the mills was being considered but this did not occur.<sup>352</sup> Some of the equipment was moved to Tovil Mill and elsewhere. Then in 1939 the mills were acquired by J.I. Blackburn & Co who moved their foundry and engineering business from Guildford to Catteshall.<sup>353</sup> Meanwhile Albert E. Reed & Co Ltd flourished, changing its name to the Reed Paper Group Ltd in 1963, the Reed Group Ltd in 1969 and Reed International Ltd in 1970.<sup>354</sup> They have world-wide interests, with United Kingdom divisions dealing with paper and packaging, wall-paper, newspapers, publishing and building products. In 1963 they took over Spicers Ltd, thus providing a further link with the history of Catteshall Mill.

## THE FOUNDRY AND ENGINEERING WORKS

### J.I. Blackburn & Co 1939–1973

In 1939 Joseph Blackburn purchased the vacant Farncombe Paper Mills from A.E. Reed & Co Ltd and renamed the property Catteshall Works. J.I. Blackburn & Co had been engineers and founders at Rodboro Buildings, Bridge Street, Guildford and at Guildford Foundry, now the site of the Yvonne Arnaud Theatre, since 1932.<sup>355</sup> Earlier, Blackburn, who was in the Royal Flying Corps during the First World War,<sup>356</sup> had been manager of Vulcansons Ltd and of Mark Webber Ltd, engineers and founders, at the same premises and he continued to make Webber engines, some of which were used to power winches at lifeboat stations.<sup>357</sup> Also at this time he built a prototype of an early electrically operated washing-machine.<sup>358</sup> It is said that Blackburn paid Reeds £2,800 for the Catteshall site and was surprised to discover that he had acquired the Grange and associated land as well as the works. Part of the agreement with Reeds was that all the remaining paper-making equipment would be scrapped. The Lancashire boilers were sold to Spaulding Russell Ltd, manufacturers of vulcanised fibre at Broadford Mills, Shalford.<sup>359</sup>

Blackburn's Catteshall Works flourished during the Second World War, carrying out a great deal of Government contract work partly in association with de Havillands. Much of this work was linked to aircraft and no doubt Blackburn's contacts from RFC days proved useful in this respect. The various buildings of the former paper-factory were converted into machine-shops, assembly areas, ferrous and non-ferrous foundries, pattern shops and stores. There were also air-raid shelters, mainly amongst the heavy masonry foundations of the old steam engines. The lay-out taken from a detailed plan of the works, prepared in 1942, is given in Fig 15.<sup>360</sup> This should be compared with Figs 14 and 10. It is striking that apart from the heavy machine shop based on the large lathe (Plate 27) the south-east range of buildings housing the water-turbine and line-shaft appears to have been little used. The firm's products included winches and gas valves for barrage balloons, floating gun platforms (tested on the ponds which still existed on the other side of Catteshall Road), and undercarriages for Mosquito aircraft.<sup>361</sup> Plate 10 shows a naval radio van carriage, consisting of a diesel electric generator mounted on a two-wheeled trailer, which was built at the works, and photographed on the road outside shortly before D-day.<sup>362</sup> Up to 300 people were employed at this time and Blackburn had an excellent reputation for training apprentices. The roof of the Spicer main beam-engine house which had been flat since the engine was removed in about 1910 was used for fire-watching. Some of the windows were shattered by bombing and a flying-bomb landed near the ponds but there was no serious damage. The Reed boiler-house chimney stack which was a recognisable landmark 150 ft high was reduced to a stump of about 50 ft in 1945.<sup>363</sup> Blackburn and his wife lived at Catteshall Grange having demolished the servants' wing and, in the early 1950s, built a new sun-lounge. Doug Heade who for many years was the pattern-maker at the works was responsible for much of this work. His father was on the maintenance staff at the mill in the 1920s and 1930s and is one of the employees on the charabanc in Plate 7.

In 1951 Blackburn had a detailed 97 page inventory prepared of 'the plant and machinery, jigs, patterns and tools, fixtures fittings and utensils, office furniture and equipment in and upon the premises known as Catteshall Works'. The summary places the following values totalling £39,407 15s on the various sections: Offices £1,893 10s, Main Machine Shop £12,113 10s, Fitting and Welding Shop £7,026, Jig Store £226, General

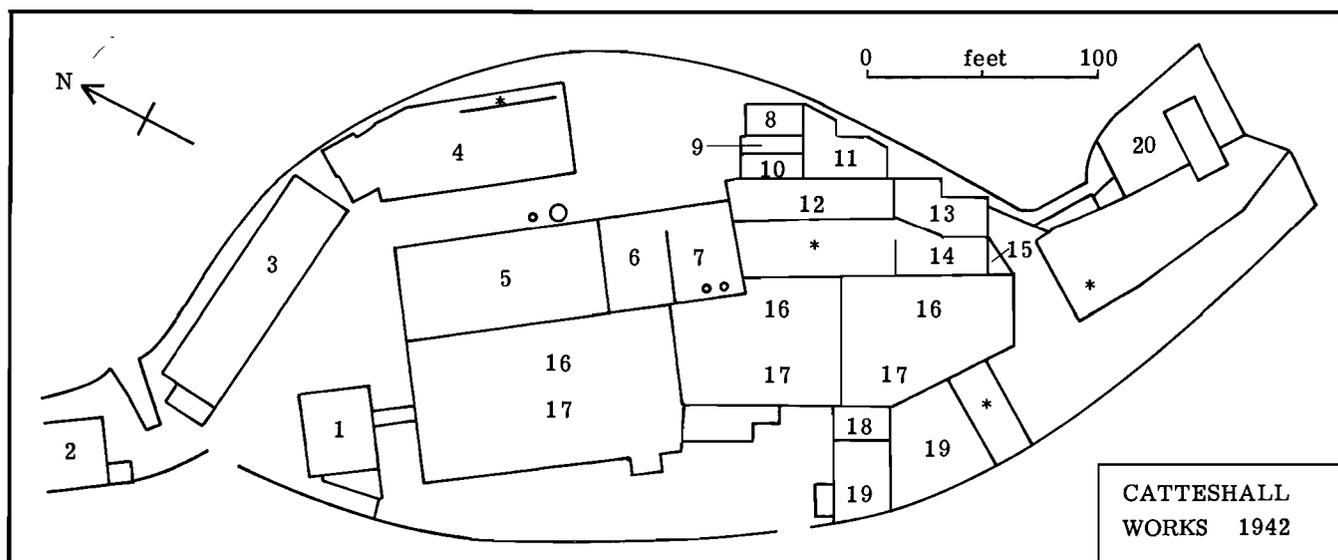


Fig 15 Catteshall Works in 1942. Based on a plan in the possession of Wiggins Construct Ltd (Catteshall).

The plan shows the offices (1), spare stores (2), the pattern shop (3), foundry material (4), iron foundry (5), core shop (6), non-ferrous foundry (7), fuel store (8), sand blast (9), rumbler (10), grinding shop (11), fettling shop (12), pattern store (13), jig store (14), micrometer store (15), three machine shops (16) and assembly areas (17), tool stores and store-keeper (18), general stores (19), and heavy machine shop (20). Four air-raid shelters are marked with asterisks.

Stores £515, Accumulator Room £210, Foundry (Ferrous) £2,344, Moulding Shop £903 10s, Foundry (Non-Ferrous) £683, Fettling Shop £1,292, Compressor House £233 10s, Rumbler House £361, Pattern Store £36, Shot Blasting Shop £181, Turbine Lathe Shop £3,168, Rear End of Premises £452, Spray Shop £594 10s, Pattern Shop £1,130, Laboratory £339, Paint Store £32 5s, Electricians' Store £345, Tools Etc. in Main Shops £3,099, Moulding Boxes £915, Jigs, Fixtures and Press Tools £750, Generally throughout Premises £430, Open Yards £135.<sup>364</sup> This list agrees well with the activities indicated by the plan of 1941. It is interesting however that the heavy machine shop of 1941 is called the turbine-lathe shop suggesting that the lathe of Plate 27 was still driven by the water-turbine via the line-shaft. At £3,000 this lathe, manufactured by Crookes-Roberts & Co of Sheffield in 1881 was the most valuable item of equipment. The main machine shop accounted for nearly one-third of the total and included twelve lathes valued between £120 and £1,200 and 16 other machine tools between £120 and £650. Most of these were belt-driven from line-shafts but a few, particularly the more valuable items, had independent electric motors. The machines were built by a bewildering range of manufacturers including Libby, Reed Prentice, Platcher, Werner & Swasey, Cincinnati and the local firm of Drummond. The fitting and welding or assembly shop had a diesel electric generator at £1,500 and two petrol electric generators at £800 each. The two pig-iron smelting cupolas in the ferrous foundry were of 10 cwt and 3 cwt capacity and valued at £750 and £600 respectively. De Havilland & Co Ltd still owned jigs, fixtures and press tools worth £750.

After the Second World War Blackburn developed a fruitful and lasting business as a sub-contractor for the General Electric Co Ltd, producing prototypes and doing small batch work of lighting equipment. Much of this was again associated with aircraft, examples being location beacons for airfield identification, long-life neon lights for the tops of high masts, illuminated T-shaped

landing direction indicators, visual approach sight indicators and obstruction lights for airfields, and glide path indicators for helicopter pads on naval vessels. Related equipment included lighting for railway platforms and flood-lighting for sports fields. Although these items were manufactured entirely at Catteshall Works they bear the name-plate of the marketing company GEC.<sup>365</sup> The foundry work carried out during this period included cast-iron inspection covers, a fine example with the legend 'J I Blackburn & Co, Godalming' being in the yard at the back of Catteshall Grange. More decorative are an interesting range of reproduction cast-iron Wealden fire-backs and fire-dogs which were also produced. During the 1950s the new technology of fibre-glass moulding became established. In particular this material has been widely used for the GEC lighting equipment.<sup>366</sup>

Blackburn was also active in public affairs. In 1958 he was elected to Godalming Borough Council and four years later (Plate 11) he became Mayor, an office he held for two years. He was also a Justice of the Peace. In 1970, when he was Chairman of the Godalming Borough Library Committee, he donated to the local museum a horse-bit which had been found in the garden of Catteshall Grange. The Assistant Master of the Armourers at the Tower of London stated that this was probably a Spanish curb-bit dating from the 18th or early 19th century.<sup>367</sup> Possibly it was imported with a load of esparto grass.

Meanwhile the activity at Catteshall Works had decreased and by the early 1970s the number of staff employed was only about 30. Little new equipment was being purchased and maintenance work was neglected particularly at the rear of the premises, where some buildings had become derelict, and at the little used south-east end of the works. The water-turbine was not used after about 1960 and work was seriously interrupted by the floods of 1968 when the water was over 2 ft deep in the machine shop.<sup>368</sup> A set of photographs taken in 1972 shows the extent of some of this dilapidation.<sup>369</sup> Eventually in 1973 Blackburn sold the works, together

with the plant, vehicles, stock and business, and also Catteshall Grange and the associated land for £182,000. The purchasers were F.C. Fairhead Ltd, a firm of building contractors of Alresford, Hants. Blackburn died, aged 76, three years later.<sup>370</sup>

## WORKS UNITS

### F.C. Fairhead Ltd and Wiggins-Wessex 1973–1977

Fairheads had existed since 1908 but in 1968 merged with C.S. Wiggins and Sons Ltd, another construction firm of Benfleet, Essex, who were established in 1919 and became a public company in 1964.<sup>371</sup> In 1975 the parent company was renamed Wiggins Construct Ltd, C.S. Wiggins and Sons Ltd and F.C. Fairhead Ltd being two of its nine subsidiaries.<sup>372</sup> The Catteshall site was of interest to Fairheads primarily because of the associated land which they planned to develop for housing and leisure activities. Indeed when they purchased the property it seems that they did not fully realise that it housed an active engineering and foundry business.<sup>373</sup> Although this type of work was outside their previous experience they agreed to allow the business to continue under the existing name of J.I. Blackburn & Co for a trial period but only in a limited part of the premises. The remainder of the works was divided into seven units as indicated in Fig 16 which is based on a plan dated 1974.<sup>374</sup> However the derelict foundry material store and the stump of the old boiler-house chimney stack, the fuel store, and the sand-blast and rumbler shops, which are marked 4, 8, 9 and 10 respectively on Fig 15 were demolished. The semi-derelict south-east part of the works was left unoccupied but accessible from the Blackburn area. The units were let to (1) BP Hydraulics Ltd who assembled small hydraulic components, (2A) Man-Equip Ltd, suppliers of protective clothing, safety equipment and tools, (2B and 4) John Bull Transport Co Ltd, international shipping

and forwarding agents, (2C) County Shades, a firm of lampshade manufacturers employing outworkers, (2D) Gartrac Fabrications, sheet metal workers specialising in strengthening the structures of rally cars and (3) PSM Services, a car breakdown and recovery firm. In 1977 unit 2A was taken over by John Bull and unit 2C by Petworth House Ltd, a mail order firm previously based at Godalming Wharf.

The creation of the works units resulted in the closure of the Blackburn ferrous foundry but some of the cast-iron products including the reproduction Wealden fire-backs were still produced by sub-contractors. However the other Blackburn activities continued in the reduced space available which was sub-divided as indicated in Fig 16. About 30 staff were employed in 1977, three being apprentices. The reorganisation involved removal of the line-shafts from the machine shops, and modern lathes and other machine tools were gradually installed. Plate 29 for example shows Don Walker, an employee at the works since 1942, operating a new Colchester Triumph 2000 lathe. The sub-contracting work producing lighting equipment for GEC Overseas Services Ltd continued and several new contracts were won. Thus a prototype variable axis wind generator or modern windmill was manufactured (this was designed for farms and small factories mainly in under-developed countries who need to generate their own electricity supply) and gas valves similar to those produced for barrage balloons during the second world war were made for a Venezuelan air-ship. The non-ferrous foundry also remained active and produced for example decorative aluminium alloy railings for a Saudi-Arabian customer. In addition bronze statuettes of horses sculptured by Pamela du Boulay were cast, an example being shown in Plate 12.

In 1975 the newly formed Industrial Archaeology Committee of the Surrey Archaeological Society met at the site to consider whether it was feasible to create a Surrey Industrial Museum in the semi-derelict south-east end of the buildings. This visit led to the research upon which the present account is based.<sup>375</sup> A preliminary scheme for the proposed museum was prepared (Fig 17)<sup>376</sup> and John

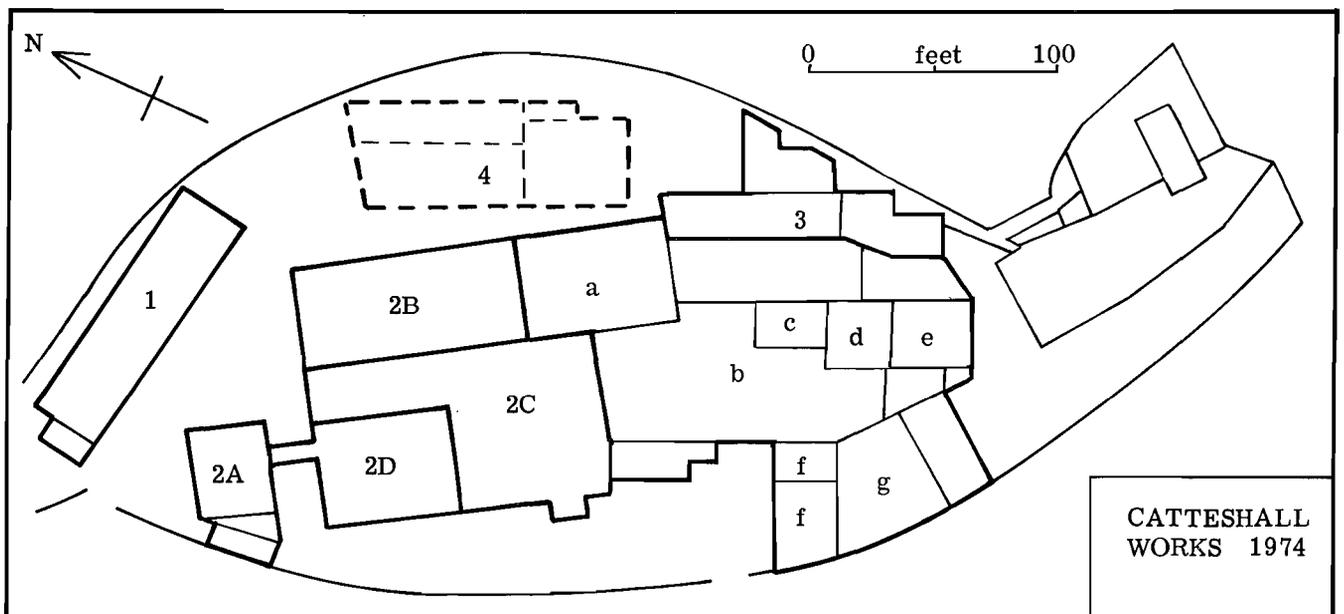


Fig 16 Catteshall Works in 1974. *Based on a plan in the possession of Wiggins Construct Ltd (Catteshall).*

The plan shows the division of the premises (by bold lines) into units 1, 2A, 2B, 2C, 2D, 3 and 4, the unit retained by J. I. Blackburn & Co and the semi-derelict south-east end of the site. The labelled rooms in the Blackburn area are the nonferrous foundry and core and fettling shops (a), the assembly and machine shop (b), the pattern shop (c), the welding shop (d), the paint shop (e), the offices (f), and the stores (g). Unit 4 shown in broken lines is located on the first floor above unit 3.

Baker featured the mill in one of his 'Seeing Eye' articles in the *Surrey Advertiser*.<sup>377</sup> A working party was set up to consider the project in depth but it soon became apparent that a much larger amount of space was needed and that the cost of creating a museum at Catteshall was prohibitive.

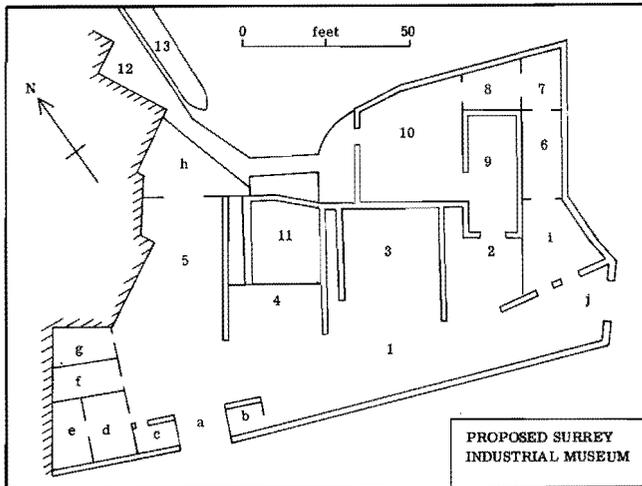


Fig 17 Proposal for a Surrey Industrial Museum housed in the south-east range of buildings at Catteshall Works. The facilities and display areas are labelled (a) main entrance, (b) cloaks, (c) bookstall, (d) office, (e) curator, (f) men, (g) women, (h) quay, (i) workshop, (j) loading bay; (1) transport, (2) glass making, (3) pottery, (4) Admiralty telegraph, (5) milling, (6) brick and tile making, (7) brewing, (8) gunpowder making, (9) cloth working, (10) engineering, (11) water-turbine, (12) rope walk, (13) narrow boat. Based on a preliminary plan prepared by J. W. Lindus Forge in 1976.

Meanwhile the south-east range of buildings which is shown in Plate 13 continued to decay and in June 1977 Fairheads applied for planning permission to reduce a section of the wall flanking Catteshall Road to one-half of its original height and to construct a flat roof over this part of the premises. In this way an additional works unit would have been created for use either by Blackburns or by a tenant. The proposal was approved but in 1978 its implementation was still awaited. During 1978 the water course through the works, which is the official River Wey, was re-opened. For many years this channel had been neglected and the sluice shown in Plate 31 which controlled the flow was permanently closed. The water was thus forced to pass through the navigation and the overflow channel which by-passed the works. This situation was not acceptable to the Thames Water Authority who insisted that the water course through the works be restored. The old sluice was therefore replaced and water again flowed past the idle MacAdam water-turbine. The vacant Catteshall Grange, a Grade II listed building, was sold in 1978. It is discussed in detail below (page 39).

In 1977 Mr David Fairhead, Chairman of F.C. Fairhead Ltd, retired and the opportunity was taken to rename the company Wiggins Wessex. This change had not in 1978 significantly influenced the proposals for developments at the Catteshall site.

## A SURVEY OF THE MILL 1976-77

### Introduction

This section contains a brief description of Catteshall Mill as it was in 1976-77. It emphasises in particular the information that could then be deduced, from existing buildings and equipment, about the history of the mill, its sources of power and its products. Separate subsections deal with the exterior of the buildings, water-power, steam-power, paper-making equipment, engineering and foundry work, and water-courses. Finally a description is given of Catteshall Grange. A far more extensive record than can be reproduced here has been deposited in the library of the Surrey Archaeological Society (see Appendix).

### Exterior of the Buildings

Plates 13-16 are four views of the mill taken from the locations marked on Fig 18 and showing different aspects of the buildings. The first of these photographs is taken from the site of Jarman's Cottages which were demolished in 1968 and illustrates at least three phases in the building history. The earliest structure is the gable-end surmounted by the chimney-pot and built partly of local Bargate stone. It dates from between 1836 when the road through the mill pool was diverted and 1844 when the tithe map was prepared. The next structure was the old beam-engine house of 1872 which projects from the rear of the building at the right. It is described in detail below (page 33). The third phase of building is the elaborate main block facing Catteshall Road which was diverted in the early 1870s. It is of ornate design constructed in red and stock brick relieved by yellow malm arches and linings and having bold cornices and a slate roof. It was probably completed by 1878 and, as clearly shown on the photograph, its construction required that the roof of the 1836-44 building be raised. The name of J.I. Blackburn & Co Catteshall Works appears on the double doors in the foreground. The curve of the road past the mill arises from the 1870s diversion and the rise occurs where the road crosses a bridge over the mill-stream which flows beneath the building.

The flat topped tower at the far end of the 1878 extension (Plate 13) is the new beam-engine house. Its facade is illustrated in Plate 14 which also shows at the left in brick relief the crest from the Spicer coat of arms (Fig 11). The origin of the corresponding flower in brick

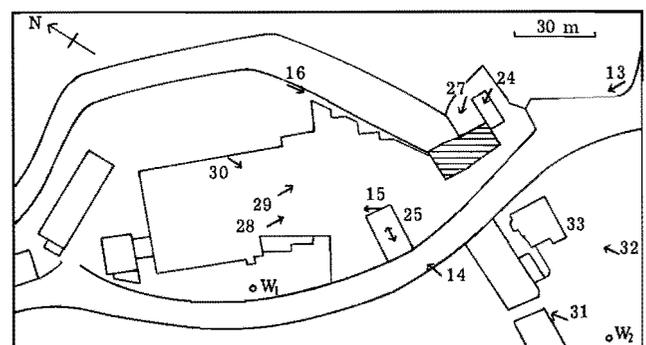


Fig 18 Site plan of Catteshall Mill in 1976-77 showing by means of numbers and arrows the camera locations and orientations for Plates 13-16 and 24-33. The corresponding information for Plates 17-23 is given in Fig 19 which is an enlarged plan of the shaded region shown here. W<sub>1</sub> and W<sub>2</sub> indicate the positions of wells.

relief at the right is not known. This building, as shown by Plate 6, originally had a gable roof with parapets along the sides and was probably modified when the beam-engine was removed shortly after 1906. It also is described in detail below (page 34).

Plate 15 is taken from the flat roof of the new beam-engine house and shows the slate, corrugated iron and glass roofs of the complex of buildings forming the northern end of the mill. These can again be matched with the buildings of 1910 (Plate 6) and, for example, with the plans of Figs 10 and 14. There are essentially three ranges of buildings represented by three sets of gable roofs. The range on the left corresponds to the extensions of 1878 ending in the large slate-roofed *salle* now housing works unit 2D and much of 2C. This range was built over the old road which was diverted in 1870 and can be seen curving around the buildings at the top left. The central narrow range of buildings is separated from that on the left by the row of cast-iron columns seen in Plate 28. The nearer part of the central range, before the break in the roof-line corresponds well in plan to a building existing in 1836. The range on the right was in existence before the 1870 highway diversion application. It culminates in the tall, slated and half-hipped roof of the dry paper store of 1910 which is now works unit 2B. The lower building with the corrugated iron roof nearer the camera housed the esparto grass boilers one of which exploded in 1883. It is now the non-ferrous foundry, the two chimneys corresponding to the two crucible furnaces shown in Plate 30. The slated building nearer still to the camera housed Reed's horizontal steam-engine and is now unit 4. Beyond the left-hand range can be seen the tall chimneys of unit 2A, the Spicer office building of

1878. Above this projects the gable-end of the timber building marked 2 in Fig 15 and shown clearly on Plate 10. This was erected shortly after 1870 and was used for storage of fuel and raw materials including esparto grass. The trees at the right and in the background are on the far-bank of the mill-tail.

The mill-tail itself is shown in Plate 16, emerging from beneath a footbridge immediately behind the mill. The confused complex of semi-derelict buildings beyond this bridge forms the core of the site, being built above the former water-wheels and the large water-turbine of about 1870 which still survives. The brick buildings on the right were originally the bleach houses of the paper-mill and now form unit 3.

### Water-Power

Three aspects of the use of water-power at the mill, water-wheels, the water-turbine and the line-shaft driven by the turbine, will be described in this section. The relevant area of the mill is shown shaded in Fig 18 and drawn in greater detail in Fig 19 which also shows the positions from which Plates 17–23 were taken. The two breast shot water-wheels, which were stated to be at the mill when the Penfold survey of about 1863 was prepared, were replaced by a water-turbine in about 1870. Although there are no physical remains of these wheels, scuff marks on the side walls of the water channel through the mill indicate their former positions. The marks on the wall on the left bank are shown in Plate 17. They correspond to the upper half of a wheel 4.9m in diameter with buckets 0.5m deep. As the head of water available was only about 2m this was clearly a low breast shot wheel. The scuff

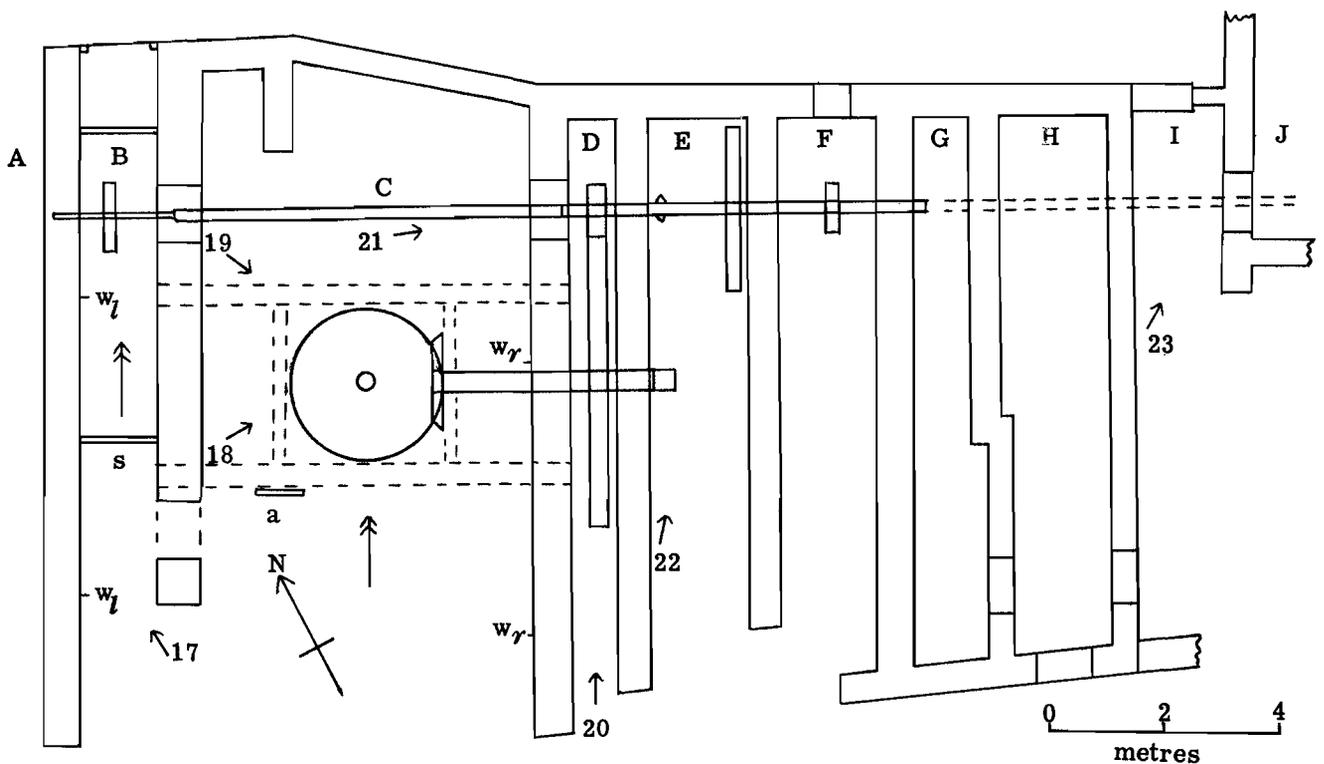


Fig 19 Plan of the Catteshall water-turbine and the line-shaft which linked Chambers A-J. The pit-wheel and the drive-wheel of the line-shaft are shown in D and three line-shaft belt wheels in B, E and F. The section of the line-shaft between G and J has been removed. Camera locations and orientations for Plates 17–23 are indicated by numbers and arrows. The capstan wheel which controls the turbine in C is indicated by a, the sluice gate in B by s, and the direction of water-flow by double arrows. The scuff marks of the earlier water-wheels on the left and right banks of the river are marked  $w_l$ ,  $w_l$  and  $w_r$ ,  $w_r$  respectively.

marks on the wall on the right bank correspond to a wheel 4.7 m in diameter. The locations of the wheels are indicated in Fig 19 by the symbols  $w_1$  and  $w_2$  on the left and right banks respectively. The total width of the water channel is 7.5 m but it has not been possible to deduce the widths of the wheels. In this connection it should be emphasised that the present wall between chambers B and C in Fig 19 dates from the installation of the turbine in C. Chamber B is the by-pass channel for the turbine and is controlled by a sluice gate, the mechanism of which is visible in Plate 17.

The Catteshall water-turbine is of the Fourneyron outward-flow type.<sup>378</sup> It was manufactured by MacAdam Brothers of Belfast and as already explained (page 16) was installed in about 1870. Benoit Fourneyron won a competition in 1827 for his invention of the first successful water-turbine. This consisted of two horizontal and concentric water-wheels with vanes curved in opposite senses (Fig 20). Falling water is deflected outwards through the vanes of the fixed inner wheel or stator and hence through the outer wheel or rotor which turns about a vertical axis. In the late 1840s William Cullen of Ulster visited Fourneyron to make arrangements to manufacture turbines in Ireland. Fourneyron was uncooperative but Cullen managed to glean enough information to make a satisfactory model on his return. He then approached James and Robert MacAdam of the Soho Foundry, Belfast and they subsequently produced turbines until their business was sold to Hetheringtons of Manchester in about 1895.<sup>379</sup> An advertisement in the *Paper Mills Directory* of 1871 states that 'After 20 years of experience MacAdams have brought their improved turbine to great perfection. It is applicable to all practicable heights of fall giving much greater power than any other kind of water-wheel. On low falls it has the great advantage of not being impeded by floods or backwater. This wheel is at work in a great many paper-mills'. In 1874 a MacAdams advertisement in the same journal states that their valuable turbine 'can be made for using a large water supply and yet work effectively through all variations of quantity down to one-fifth or even less if required. It is easily coupled to a steam-engine'.

The location of the Catteshall turbine is shown in chamber C of Fig 19 and its main features are indicated on the sectional drawing of Fig 21. The rotor and stator wheels are submerged in the murky waters of the mill-tail and the features shown in the lower parts of the diagram are therefore based in part upon the observations of sub-aqua divers working in difficult conditions (see Preface). It is encouraging however that the resulting drawing is similar to diagrams forming part of an advertisement for turbines dating from the 1850s manufactured by a rival firm, Gardner & Co of Armagh.<sup>380</sup> Figure 21 shows that the turbine, together with its associated gearing, is supported on three pairs of horizontal wooden beams of square cross-section and 7.0 m long which pass through the side walls of chamber C and protrude slightly into B and D. The stator or inner wheel is fixed to the under side of the bottom pair of beams. Water falling from above is channelled to its vanes by passing over the curved outer surfaces of a vertical tube, shaped like the bell of a trumpet. This tube which is strengthened by four flanges is fixed to the bottom of the stator wheel and is bolted at its top end to a vertical cylindrical tube which extends upwards. It is shown protruding from the water in Plate 18. The rotor or outer wheel turns anti-clockwise. It is fixed to a vertical shaft which passes through the tube of the stator and is supported at its upper end by means of a thrust bearing on a massive iron framework bolted to the top pair of beams. Three of the bolts, two at the top left and one at the far right, are seen protruding through the under-sides of these beams in Plate 19. Between the beams a bevelled horizontal crown wheel

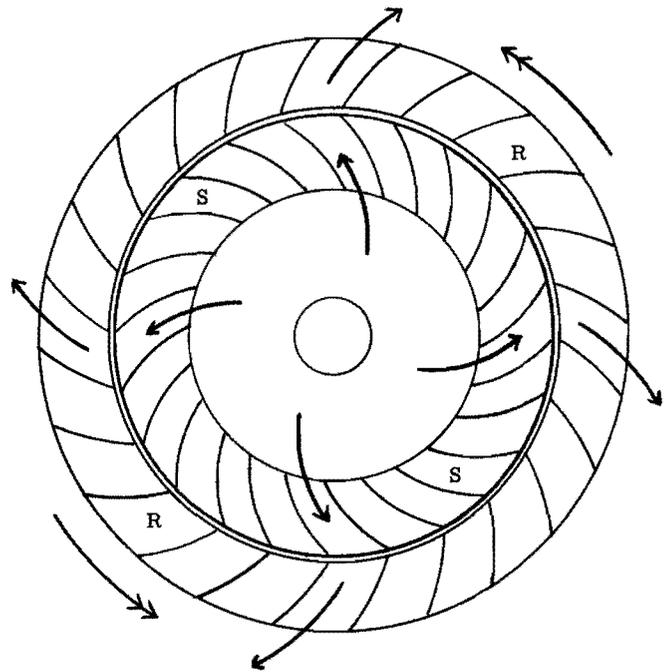


Fig 20 Principle of Fourneyron's outward-flow turbine. Water flows as indicated by the single arrows through the curved fixed guides of the stator S and thence through the vanes of the rotor wheel R which are curved in the opposite sense. This causes R to rotate in the direction indicated by the double arrow.

2.4 m in diameter and with 75 cogs is attached to the shaft of the rotor. The top of the stator tube is also just visible in this photograph.

The stator and rotor have 48 vanes and these are divided into four sections as shown in Fig 21 by means of horizontal plates. The number of sections used depends on the flow of water and is controlled by raising or lowering a cylindrical gate 2.5 m in diameter and 0.57 m deep which is seen in its raised position in Fig 21 and protruding from the water in Plate 18. The gate is operated by turning a vertical capstan wheel with six handles located above the top upstream wooden beam and marked a in Fig 19. The control mechanism is shown schematically in Fig 22. The capstan drives a pair of bevelled cog wheels and hence a vertical rod, which is seen at the extreme right of Plate 19. This drives a system of horizontal cog wheels supported on a heavy iron plate bolted to the middle pair of wooden beams. This system which is a major feature of Plate 18 consists of a large central cog wheel linked to three symmetrically placed smaller wheels one of which is driven by the capstan. Threaded vertical rods pass through dies at the centres of these three cog wheels and extending downwards are fixed to the gate. The lower unthreaded parts of two of these rods are seen in Plate 19. The gearing is such that one turn of the capstan raises or lowers the gate by about 3 mm.

The turbine last worked in about 1960 when its speed was noted to be about 25 rpm. It could not however be used for more than a few hours because of lack of water probably caused by silting of the mill-stream. It generated about 37 kW which is consistent with information in the Spicer letters of 1873 and also with a table accompanying the Gardner turbine advertisement.<sup>381</sup> No other turbine of this period, type and size is known to exist. The only comparable examples appear to have had wheels only about 0.6 m in diameter and to have been at least partially dismantled and scrapped.<sup>382</sup> These worked by water under

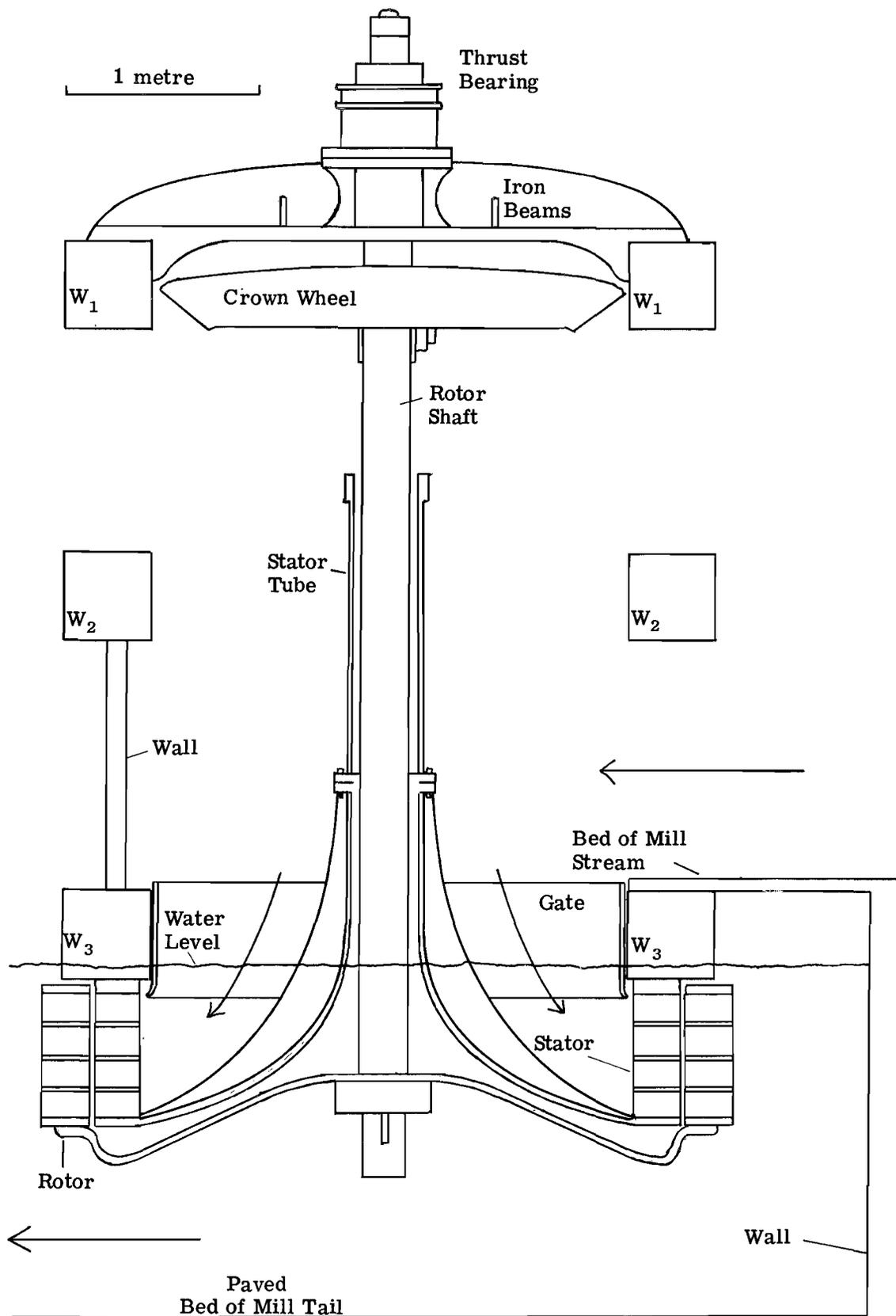


Fig 21 Sectional scale drawing of the MacAdam-Fourneyron water-turbine at Catteshall Mill. The turbine is supported by three pairs of wooden beams  $W_1$ ,  $W_2$ ,  $W_3$ . Water flows from the right and as indicated by the arrows falls and is deflected outwards by the curved stator tube through the vanes of the stator and thence through the vanes of the rotor. The vertical shaft of the rotor is held from above by a thrust bearing supported on iron beams and the bevelled crown wheel is fixed near its top. The control gate is raised or lowered by a system of gears illustrated in Fig 22.



Fig 23 Rubbing of one of the two MacAdam name-plates on the framework of the turbine. The original is 224 mm by 112 mm.

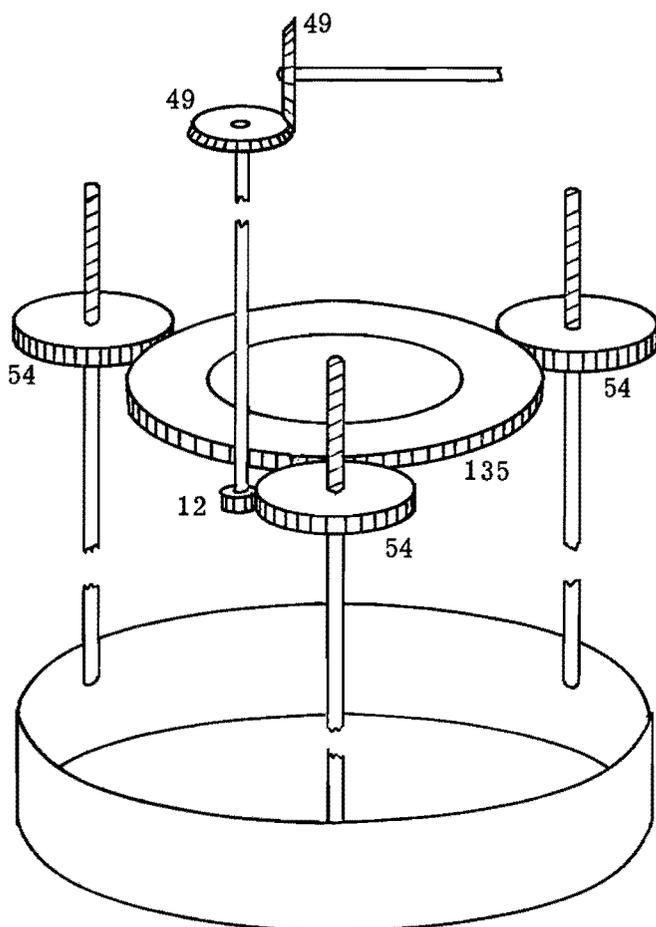


Fig 22 The system of gears which controls the turbine gate, which is 2.5 m in diameter. The number of cogs on each gear wheel is as indicated and the pitch of the threaded rods which are linked to the gate is 12.7 mm. Various features of the mechanism are shown in Plates 18 and 19 and in Figs 19 and 21.

pressure surging up through the body of the turbine rather than by falling from above as at Catteshall. The characteristics of the Catteshall turbine are determined by the small head but large volume of water available at the site.

The crown wheel of the turbine drives the vertical bevelled cog wheel 1.48 m in diameter and with 45 cogs which is shown in Plate 19. This wheel and its horizontal shaft are supported by an iron framework bolted to the top and middle wooden beams. Two MacAdam Brothers name-plates are attached to this framework; a rubbing of one of these is reproduced as Fig 23. The shaft which is 0.25 m in diameter passes through the walls between chambers C, D and E and drives the pit-wheel in D shown on Plate 20. This wheel is 4.40 m in diameter and has 8 spokes and 176 wooden teeth. Plate 20 also shows projecting from the left wall the ends of the top and middle pairs of wooden beams which support the turbine. The scuff marks of an earlier and lower pit-wheel are visible on both walls.

The pit-wheel drives a line-shaft which (Fig 19) originally linked chambers A to J, passing through brick arched or iron framed openings in the nine intervening walls. It now consists of two major collinear sections each 6.40 m long and about 0.20 m in diameter traversing C to F and a small extension 2.0 m long and 0.08 m in diameter across B. A further major section extending the shaft from F to J is now missing but the junction flanges

remain on the floor of G. As indicated in Fig 19 the shaft is driven by means of a cog wheel in D, which meshes with the pit-wheel, and at present has three belt wheels in B, E and F. The shaft is just visible in the distance in Plate 20 and some of its features are illustrated in Plates 21–23. Plate 21 shows the shaft passing through the arched opening between chambers C and D. It is supported by a bearing beyond which is the junction between its two existing major sections and then the iron drive-wheel. This is 1.35 m in diameter and has 57 cogs, the gearing being such that one turn of the turbine wheel produces about 5 turns of the line-shaft. Beyond the cog wheel is the square iron framed opening between D and E. Plate 22 shows the belt wheel on the line-shaft in chamber E. This wheel is 2.60 m in diameter, 0.27 m wide and has six S-shaped spokes. Its belt drove equipment in F by means of a short shaft supported on the concrete post in the right foreground in the photograph and passing through the square oil-stained hole in the right wall. Plate 22 also shows the end of the shaft of the pit-wheel protruding from an iron-framed opening in the left wall and the hub of a second wheel which has been cut from the line-shaft. A built-up doorway in the distance indicates that this chamber pre-dates the line-shaft. The belt wheel in F is 0.71 m in diameter 0.24 m wide and has 4 spokes. Its belt passed through an opening in the back wall of this chamber and drove the 1881 Crookes-Roberts lathe (Plate 27). The belt wheel in B on the small extension to the line-shaft is 1.24 m in diameter, 0.31 m wide and has 18 pairs of spokes. Its use is uncertain but it is adjacent to the lift-shaft shown on Figs 10 and 14. Plate 23 shows the arched opening between I and J together with the bearing which once supported the missing section of the line-shaft. Again the wall is heavily stained with oil below the bearing. The arch is very similar in form to that shown in Plate 21. It is clearly contemporary with the wall which demonstrates that J was designed to accommodate the line-shaft.

### Steam-Power

On the 1878 plan of Catteshall Mill (Fig 10) rooms 12 and 13 are stated to be the 40 hp and 78 hp engine houses respectively. These rooms correspond to chambers A and J in Fig 19 which lie at the ends of the line-shaft and in view of the MacAdam advertisement of 1874 it seems clear that the engines and water-turbine were coupled.<sup>383</sup> Unfortunately no physical evidence survives of the 40 hp engine but chamber J despite its resemblance to a Victorian Gothic chapel was clearly built as a beam-engine house. Its exterior is at the right of Plate 13 and the interior is shown in Plate 24. In addition Fig 24 provides scale drawings of the building and some of its decorative features. It is a narrow tall building of light orange brick

with a slate roof surmounted by a decorative lantern. As shown in Fig 24(a) about one-third of its length is incorporated in the earlier mill building. The SE side wall has a Gothic window, with a key-stone dated 1872, and a small square window. The NE end wall has a large Gothic window, an elaborate quatrefoil window with coloured glass, and a decorative barge-board. The interior walls are plastered and marked out in rectangular blocks and the fine roof trusses are decorated with triangular trefoil panels. There is an arched Gothic door in the NW side wall (Plate 24). Several features indicate that the building was originally a beam-engine house. The exterior of a semi-circular arched opening in the NW wall which accommodated the line-shaft is shown in Plate 23. A second adjacent opening of this type has been partially destroyed by the later rectangular opening seen in Plate 24. Two transverse heavy wooden beams above the Gothic doorway would have been used for installation and maintenance of the engine. The original cylinder floor at the level of the foot of the door was raised above ground level leaving space below for the engine bed, condensers and other equipment. Two openings in the wall beneath the door could have accommodated steam pipes. There are clear indications on the floor and walls that heavy equipment was housed in the building but these are difficult to interpret. The lower parts of the walls were match-boarded and the plaster work suggests that there was a platform floor above the line-shaft. It is likely that the engine was removed when a new much larger beam-engine was installed in about 1878. This resulted in the cylinder floor being removed, a large rectangular door being inserted in each side wall and a new upper floor seen from below in Plate 24 being constructed above the line-shaft. The transverse shaft with three belt wheels, two of which are visible in Plate 24, could also have been inserted at this time.

The 1878 extensions to Catteshall Mill shown at the left in Plate 13 included a new beam-engine house. The exterior of the SW wall of this building which has a large window is shown in Plate 14. Its location is numbered 23 on the 1878 plan (Fig 10) where it is labelled '300 HP Engine'. The adjacent room 24 is the 'Fly-Wheel House'. In the sale particulars of 1906 the 'Main Beam Engine House' is described as 'A lofty brick building with slated and boarded roof on timber principals and framing, boarded floor, plastered walls, end lighted by a large glazed sash' and the motive power included 'A 400 IHP compound condensing beam engine with 36 inch high and 42 inch low pressure cylinders, 6 feet stroke, Corliss valves, heavy cast iron fly and spur wheels and pinion on main shaft'.<sup>384</sup> This suggests that the 300 hp engine had been compounded using the McNaught system of adding a high pressure cylinder at a quarter point of the beam.<sup>385</sup> In 1910 the building was described as 'Size making house with iron girders supporting tank and having concrete floor'.<sup>386</sup> This tank can be detected through the top two sections of the window in Plate 14 and is seen from below supported by brickwork on two iron girders in Plate 25.

Figure 25 provides scale elevations and plans reconstructing this building and the beam-engine it contained. The only striking change to the exterior is that the original gable roof was replaced by a flat roof probably when the water tank was installed. The original structure is seen in Plate 6 and the stone corbels marked 1 in Fig 25 which supported the brackets of the main roof trusses still survive. Blocks of stone (2) strengthen the side brick walls immediately above and below the iron beams (3, 4) which are shown in Plate 25. The lower part of the wall shown in (a) is masked by an adjacent building and contains an original bricked-up entrance doorway (5). Traces on the plaster work of the interior walls indicate that stairs originally led upwards from this doorway to the cylinder floor (7), which has its own entrance (6),

then to the cylinder staging (8) and finally up to the beam floor (9). The traces of this floor are visible on the left hand wall in Plate 25(b) immediately above the iron beam. The rocking beam (10) of the engine was supported by the iron beam (3) which rested upon a pair of columns (11). The location and diameter of the fly-wheel (12) is defined by marks on the plaster above the cylinder floor and the original opening in the side wall which accommodated its axle. The horizontal distance between this axle and beam (3) fixes the half-length of the rocking beam and hence the locations of the low- and high-pressure cylinders (13, 14). The shape of a slightly raised platform on the cylinder floor suggests the position of the valve chest (15). The massive masonry foundations of the engine (16) are entirely consistent with this reconstruction. The square opening in the SE wall (17) is heavily stained with oil and as shown in (a) was adjacent to the rim of the fly-wheel. The separate fly-wheel house of Fig 10 does not appear to have been built.

The heavy masonry foundations, labelled 28 in Fig 14, of the horizontal steam-engine of about 500 hp installed by Reeds still exist but are difficult to interpret. The upper floor of this building as shown in Fig 16 has been converted into works unit 4 and all evidence of the engine it housed has been destroyed. However outside Chamber F (Fig 19) there is a heap of 70 mm diameter cotton rope (Plate 26) which was once driven from the fly-wheel. The slated roof of this engine-house is seen at the right in Plate 15. The boiler-houses associated with this and the other steam-engines have been destroyed.

### Paper-Making

Although almost all of the buildings now forming Catteshall Works were originally used for making paper there is little direct physical evidence for this past activity. Acting upon instructions from Reeds, J.I. Blackburn scrapped the old paper-making equipment when he purchased the site in 1939 and the only items which appear to have escaped destruction are four wooden stretcher-rollers 2.79 m long and 0.23 m in diameter. These dimensions are consistent with the wider of the two paper-making machines purchased by Spicers in the 1870s. Attached to the surface of each of these rollers are two fabric tapes 30 mm wide which spiral outwards in opposite senses from the centre to the ends. These tapes prevented the paper from creasing as it progressed through the machine. The locations of the two paper-making machines, labelled 16 and 21 in Fig 10, can still be traced on the floor of the Blackburn machine-shop. The circular foundations of some of the beating engines which were housed on the first floor above the water-turbine can also be clearly seen together with traces of the china clay which was stored in this part of the mill. A small platform projects from the far end of this floor into the receiving hall which is marked 1 in Fig 14. Below this platform a deep groove has been cut by a chain into the brickwork of an opening, which demonstrates that it was associated with a hoist for lifting paper-making materials to the stores above. The wall from which the platform projects forms part of the extension to the paper-mill built in about 1840 whereas the receiving hall was built in 1878 on land previously occupied by the adjacent road which had been diverted. Thus the hoist originally may have lifted material from outside the building. Materials could also be raised to the upper floor by means of a lift the remains of which are located at the north end of Chamber B in Fig 19. This lift is marked on the 1878 plan of the mill (Fig 10).

The remains of some early electrical installations dating from the paper-mill period still exist at the site. For example the vertical strip of wood above the Gothic

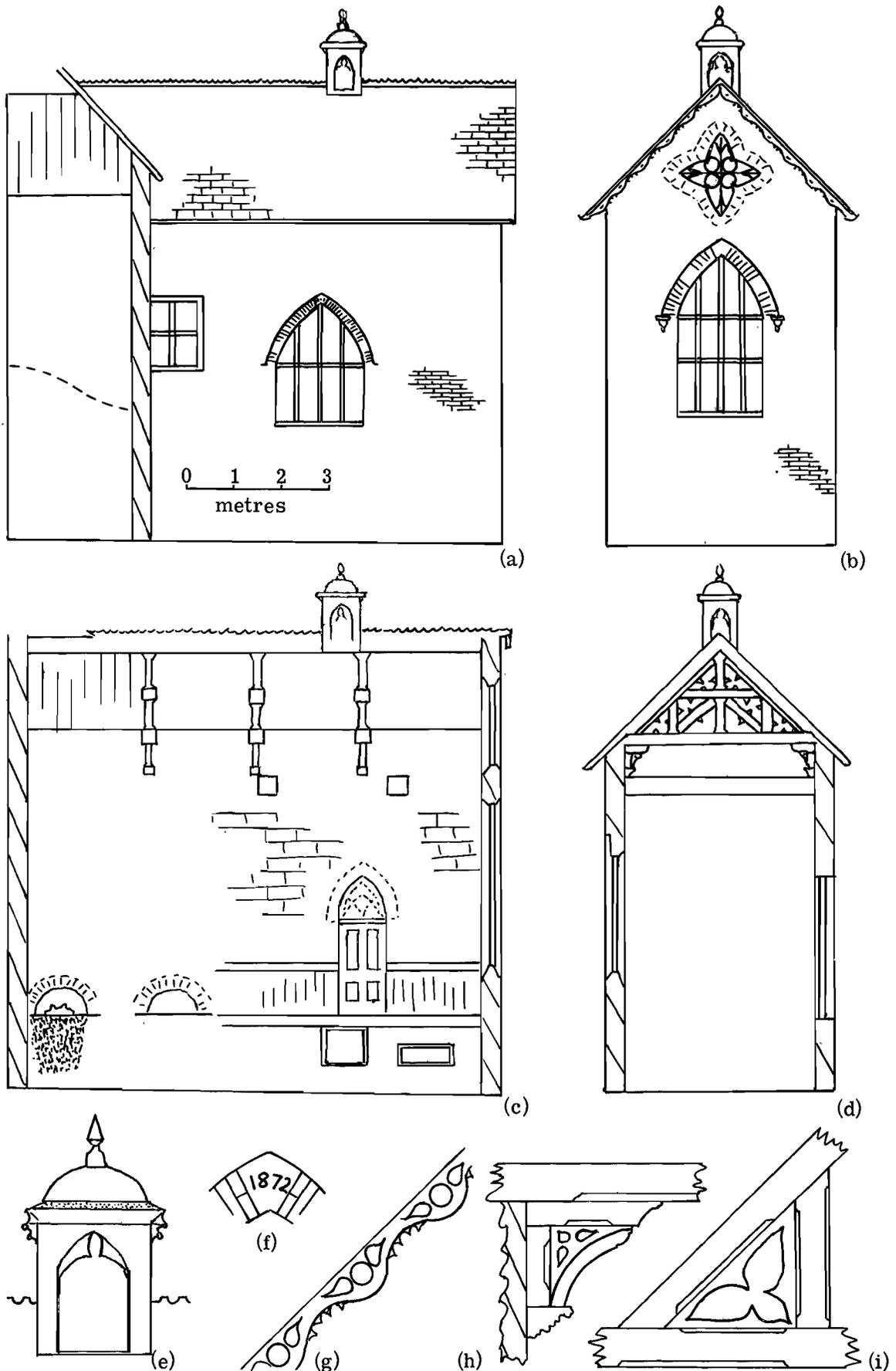
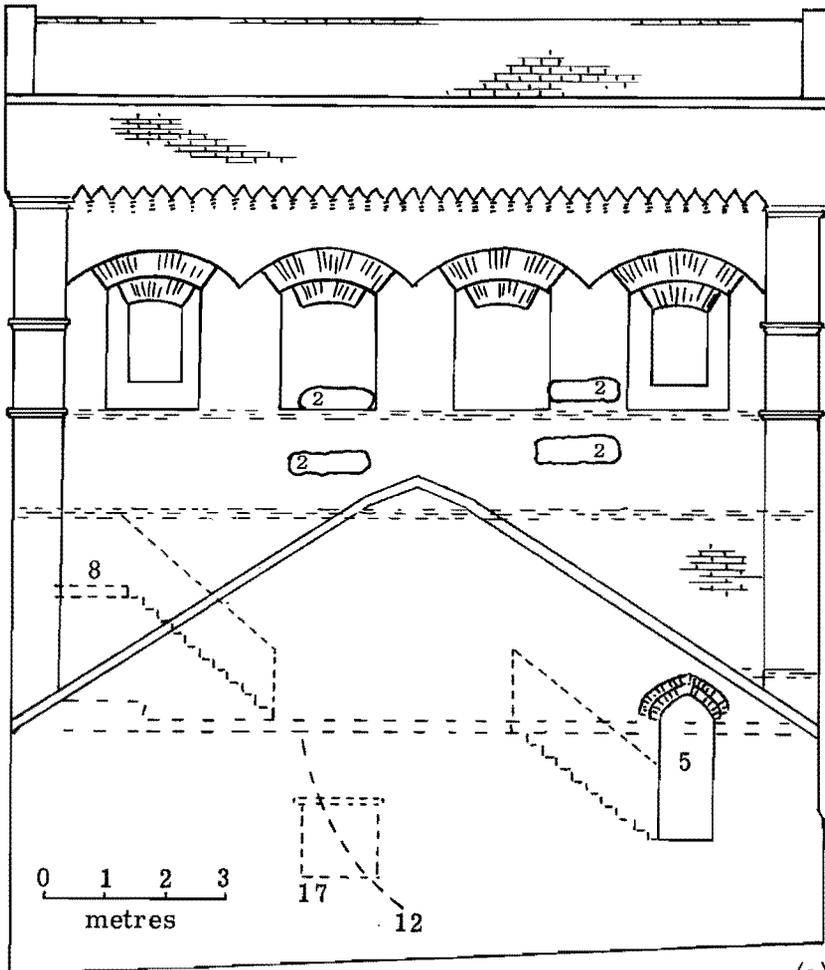
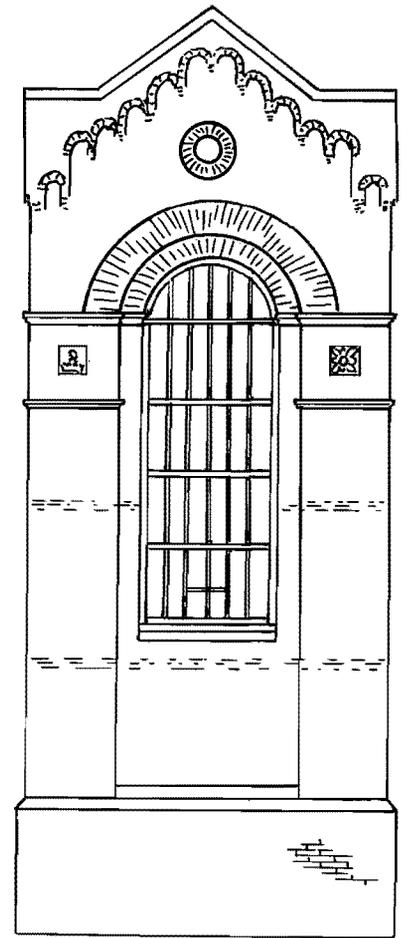


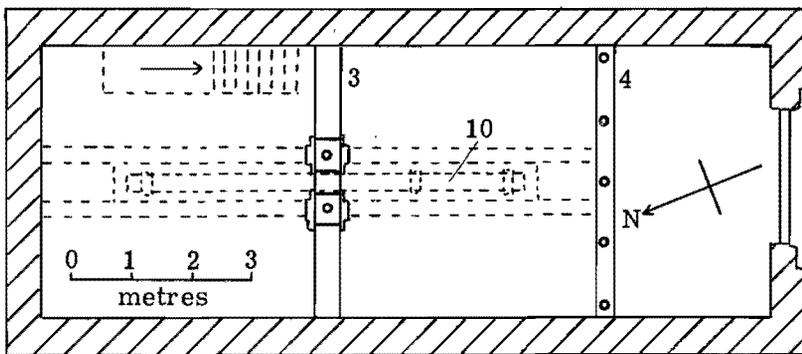
Fig 24 The Old Beam-Engine House of 1872 showing (a)-(d) exterior and interior elevations from the SE and NE and (e)-(i) details of the lantern (x3), the keystone in (a) (x4), the bargeboard in (b) (x3), a beam bracket in (d) (x4), and the roof structure in (d) (x4). A scale is given in (a). These drawings reconstruct the original appearance of the building which is shown modified and partially derelict in Plates 13 and 24.



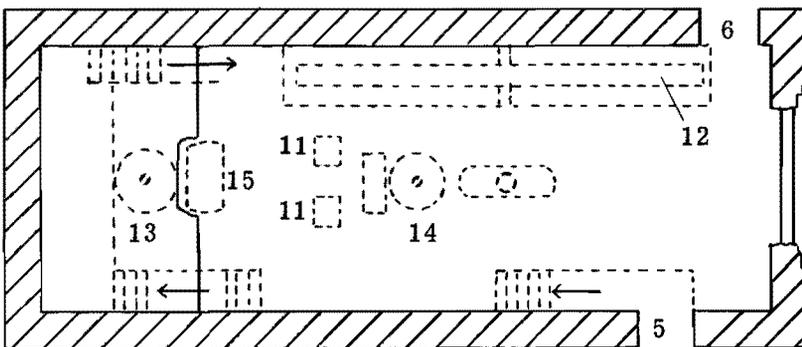
(a)



(b)



(e)



(f)

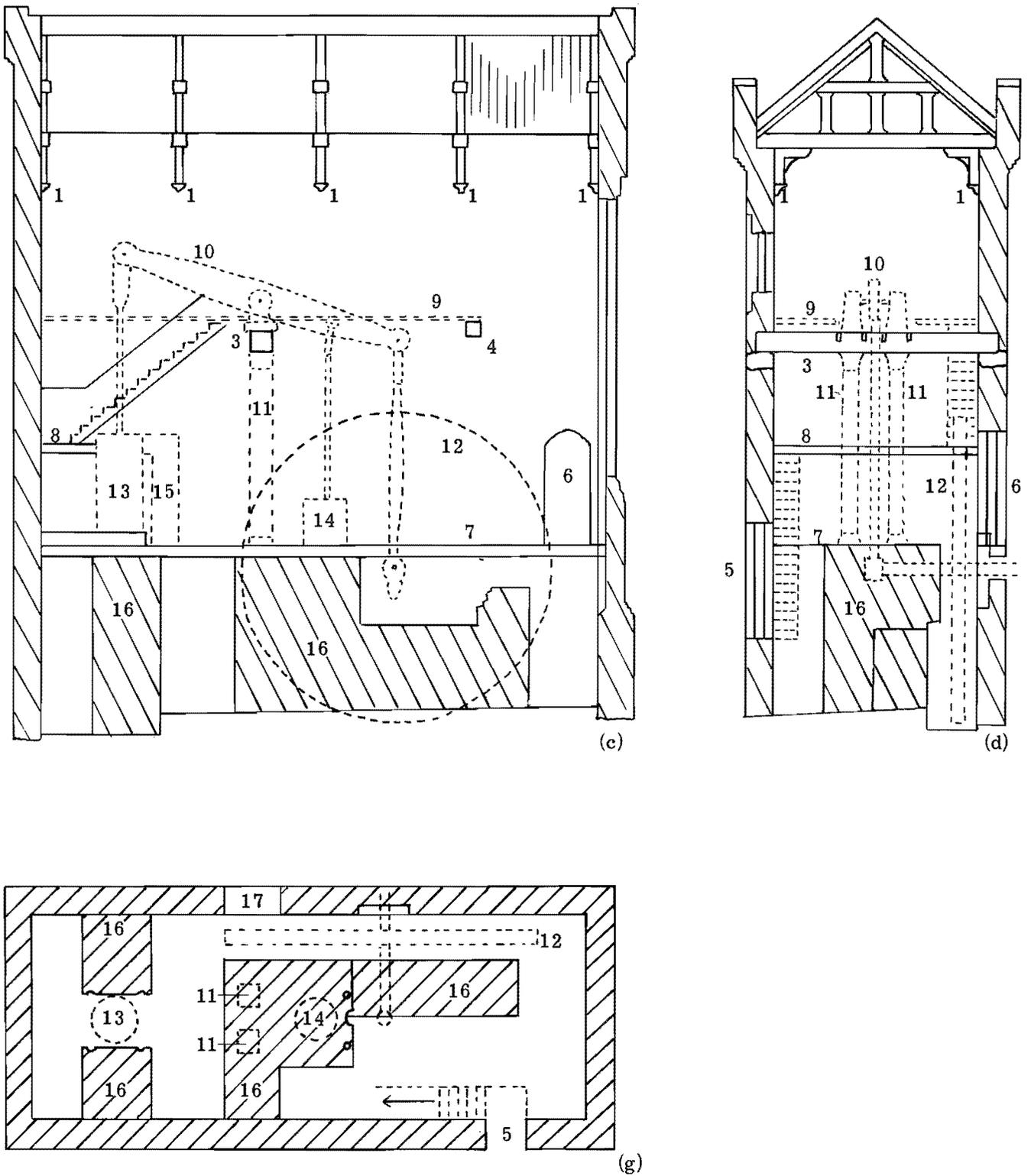


Fig 25 The Main Beam-Engine House of about 1878 showing (a)-(d) exterior and interior elevations from the NW and SW and (e)-(g) plans of the beam floor, cylinder floor and foundations. Scales are given in (a) and (e). These drawings give a reconstruction of the original building and beam-engine. The numbers correspond to the following features: corbels (1), stone blocks (2), iron beams (3,4), original doorways (5,6), cylinder floor (7), cylinder staging (8), beam floor (9), rocking beam (10), columns (11), fly-wheel (12), low- and high-pressure cylinders (13,14), valve chest (15), engine foundation (16), and wall-opening (17). The arrows on the stairs in (e)-(g) point upwards. The building is shown in Plates 6 and 14 and the iron beams in Plates 25.

doorway in Plate 24 has two grooves which must have housed bare wires, and early insulators are fixed to the horizontal piece of wood across this doorway. A direct link with paper-making is provided by three slate slabs (Plate 26) which formed part of a switchboard. Two of these measure 1.14 m×0.43 m×30 mm and the third 0.87 m×0.38 m×30 mm. All three have been drilled with holes to accommodate electrical wiring and one of the larger slabs has labels marked 'small dynamo, large dynamo, 40 hp motor, potcher's motor, reelers, cutters, and lighting'. The switchboard was probably located originally near the Reed steam-engine.

A final link with paper-making is provided in unit 2B (Fig 16) by a gantry crane manufactured by Herbert Morris Ltd of Loughborough. This was previously the Blackburn ferrous-foundry but the crane was installed during the Reed period when it was the dry-paper store housing heavy reels of paper.

### Engineering and Foundry Work

The most interesting item of engineering equipment at Catteshall Works is the large lathe (Plate 27) which has the following name-plate: 'Crookes Roberts & Co. Sheffield 1881. No 424'. The firm of Crookes Roberts, according to an advertisement in the *Paper Mills Directory* for 1874, were 'Steel convertors and refiners, manufacturers of super cast steel for engineering purposes, saws, files, engineers tools, hydraulic and screw presses and lifting jacks. Makers of turning, lathes, planing, drilling, slotting, shaping, punching and shearing machines etc.' They were acquired by Alfred Beckett & Sons Ltd in 1924 who in turn were taken over by Tempered Tools Ltd in 1960.<sup>387</sup> The Catteshall lathe is housed in the heavy machine shop labelled 6 in Fig 14 and 20 in Fig 15 which was built as part of the 1878 Spicer extensions to the paper-mill. It was belt-driven from the line-shaft through an opening at the back of chamber F (Fig 19). The 1951 inventory<sup>388</sup> describes the lathe and its associated equipment as follows: '20" centres gap bed centre lathe, 5'8" swing in gap, 16' between centres. Overhead counter-shaft with four speed cone pulley, pair of fast and loose pulleys and 20' of 5" canvas belt. Wall mounted counter-shaft of 8' of 3" MS shafting. Two 30" wall brackets. Two 3" Plummer blocks. 36"×10" face SS driving pulley. 24"×15" face SS pulley. 40' of 5" canvas belt 36" 4-jaw chuck. 60" face plate'. Many of these items can be seen in Plate 27. The lathe was valued in 1951 at £3,000 and it is interesting that it may never have been fully paid for as in 1906 the Farncombe Paper Co Ltd owed Crookes-Roberts £47.<sup>389</sup> It was last used in 1974.

The Blackburn machine shop is shown in Plate 28, taken from location 28 of Fig 18. The uniformly spaced cast-iron columns which replaced the outer wall of the building when the paper-mill was extended in 1878 are a feature of this photograph. The machine tools shown date mainly from the 1920s and 1930s and many of them are listed in the 1951 inventory. Then however most of them were belt-driven from line-shafts whereas now they are operated by independent electric motors. At the right of Plate 28 can be seen some GEC lighting equipment awaiting assembly. Plate 29 shows a new Colchester Triumph 2000 lathe which was installed in 1976.

The non-ferrous foundry labelled (a) in Fig 16 is shown in Plate 30. This photograph was taken from location 30 of Fig 18. Again the equipment is largely as described in the 1951 inventory. The main features are the two crucible furnaces which were designed and built by Blackburns. The covers and flues lead to the two chimneys seen emerging from the corrugated iron roof just to the right of the centre of Plate 15. There are several crucibles and a pile of foundry scrap near the furnaces and pouring

shanks, lifting tongs and crucible harnesses on the walls. One pouring shank is set up before the right-hand furnace ready to receive a crucible. In the foreground are a large number of rectangular mould boxes and some sieves. The jib crane has an 18 ft arm with a 1 ton pulley block on a travelling carriage. The du Boulay bronze statuette shown in Plate 12 was cast in this foundry.

### Water-Courses and Wells

The availability of an ample supply of water which can be effectively controlled is essential for all water-mills but is particularly important for paper-mills which also require large quantities of clean water for the manufacturing processes. Water-courses, filter-beds, reservoirs and wells have therefore played a major role in the history of Catteshall Mill. The River Wey originally flowed along a channel which is now close to the right bank of the Navigation. This channel is indicated on the plans given in Figs 2 and 3 which date from the mid-18th century when it was called the 'Old River'. The mill-stream or 'New River' which is 500 m long was probably constructed some nine centuries ago along the right hand side of the valley and gives a head of about 2 m of water at the mill. A weir was necessary where the two channels diverged and in 1300 this would have been controlled by Robert atte Were who was a customary tenant of Catteshall Manor.<sup>390</sup> These two water-courses appear to have sufficed until 1656 when it was proposed to dig an emergency channel by-passing the mills.<sup>391</sup> The next significant event was the construction of the Navigation in 1760 which reduced the flow of water in the Old River and modified its course. In 1809 the resulting meandering stream defined the northern edges of properties 13, 14 and 15 of Fig 5 and this is confirmed by the 1844 map of Fig 8. This map and the 1910 plan (Fig 13) show a water-course, which may relate to the 1656 proposal, linking the mill-stream to the Old River. During the late 1940s this channel was enlarged and straightened. In particular it now no longer enters the mill-tail between buildings 2 and 3 of Fig 15 but between building 2 and the Navigation as shown in Fig 1C. Although it was constructed as an overflow, the new channel effectively became the River Wey when during the early 1970s the sluiceway adjoining Catteshall Grange decayed and the water-course through the mills was blocked. This sluiceway which is shown in Plate 31 had five paddles and was built by Spicers in about 1870 when they installed the water-turbine. It was replaced by a modern gate in 1978. The mill-tail, as indicated for example by Figs 2, 6, 13 and 18, has gradually become smaller as the importance of water-power has decreased. Although commercial traffic on the Navigation has ceased, Farncombe Boatyard, based on the slip of land upon which in the early 19th century the Sweetapples had their flourhouse, has a flourishing trade hiring leisure craft.

Although much of the land between the mill-stream and the Navigation is overgrown the water-channels discussed above can still all be followed. In addition the reservoirs marked 3 in Fig 13, although levelled with rubble, can still be traced from the relatively luxurious vegetation along parts of their edges. No remains have been detected however of the other filter-beds and water-tanks and of the elaborate system of sluices which controlled the effluent from the mill, particularly during the period when paper was made from esparto grass.

The 1871 and later Ordnance Survey maps mark a 'covered well' or 'well house' at the location in the grounds of Catteshall Grange labelled W in Fig 13. Nothing can now be detected at the spot. The 1910 sale particulars state that, in the grounds of the Grange, there were three wells which augmented the water supply from the river.<sup>392</sup>

There was also a well in the yard in front of the mill and one still exists in the garden of the Grange near the millstream. The locations of these are marked  $W_1$  and  $W_2$  in Fig 18. The records of the Hydrogeological Department of the Institute of Geological Sciences state that Well 285/23 at Catteshall Mill existed before 1884 and was 540 ft deep.<sup>393</sup> The top 40 ft was 5 ft in diameter and lined with cast-iron tubing, the remaining 500 ft being a bore-hole 1 ft in diameter. The well penetrated 12 ft of drift and 38 ft of the Hythe Beds of the Lower Greensand which provide an ample supply of good quality water. The other 490 ft was through impermeable Atherfield and Wealden Clays and did not tap further water bearing beds. The yield was therefore inadequate and the well was not in use. During the Second World War this well could not be found but there were three 30 ft wells, presumably the ones mentioned in the 1910 sale particulars, which were still used. However in the late 1950s a silted-up well about 5 ft in diameter was discovered at the site. J.I. Blackburn who was living at the Grange proposed to use it for watering the garden.

### Catteshall Grange

The building which is most closely related to Catteshall Mill is the Grange, situated on the opposite side of Catteshall Road on the right bank of the mill-stream. Various aspects of its history have already been discussed. Briefly the site appears to have belonged to the Parke family from at least 1300 to 1664 when it was known as Parkelands or Leathers. It was then sold to the Pennycod-Hunt-Trigg-Chitty-Joyce family and became known as the Blockhouse. In 1794 John Sweetapple, owner of the mill, purchased the house. His family rebuilt it in 1810 and continued to live there until 1868. It was then acquired by the Spicers who called the house the Grange. They extended it in the 1870s and occupied it until 1898. Albert E. Reed appears to have lived at the house for four years from 1907 but then the house was

held by tenants. In 1939 J.I. Blackburn acquired the property, demolished a wing, added a sun-lounge and lived at the house until 1973 when it became vacant. Changes in the plan of the building since 1800 are indicated in Figs 5, 6, 8, 9, 13 and 18 and the relevant features are redrawn at a consistent scale and orientation in Fig 26.

Catteshall Grange is a Grade II listed building. It was surveyed in 1977 by the Domestic Buildings Research Group (Surrey) and the following account is drawn in part from their report.<sup>394</sup> The house is a square two storey building with two distinct major phases of construction. The original block near the mill-stream is shown in Fig 27. It probably dates from the 17th century and is of

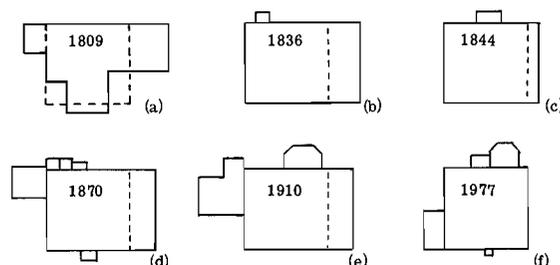


Fig 26 Plans of Catteshall Grange taken from: (a) the 1809 inclosure map; (b) the 1836 road diversion plan; (c) the 1844 tithe map; (d) the 1870 road diversion plan; (e) the 1910 sale particulars plan; (f) the 1977 Domestic Buildings Research Group report. These plans are all drawn to the same scale although the originals vary considerably in both scale and accuracy. In particular (a) and (c) are less reliable than the other plans. The broken lines serve to outline squares of edge 11.5m corresponding to the plan of 1977.



Fig 27 Catteshall Grange from the NW viewed across the mill-stream. Drawing by K. M. Dodson of the Domestic Buildings Research Group (Surrey)

Bargate stone with quoins consisting of three courses of thin bricks. It is likely that it was originally roofed with Horsham stone slabs some of which were later re-used to make sills for ground floor joists. The front block illustrated in Plate 32 dates from 1810 and is again of stone but with a brick facade. The eaves-line of the earlier structure is made compatible with that of the extension by means of stone and brick corbelling and the whole is covered with a tiled hipped roof again dating from 1810. The central bay in Fig 27 is probably the chimney of the original ingle nook hearth and the bay window which dates from 1873 was castellated until 1939. The two main building phases are clearly visible on the side wall of the house in Plate 32. This photograph also shows the sun-lounge and porch of 1939 and part of the mill buildings in the background. On the side wall beyond the sun-lounge there are traces of the demolished servants wing. On the opposite wall facing the mill there are two downstairs and two upstairs blocked window openings of the original house. These are symmetrically placed and indicate that the earlier house was considerably lower than the present structure. These blocked openings were later cut by two doorways which are also now blocked. This is consistent with the plans of Fig 26 which suggest that there used to be an extension at this side of the house. There are two cellars at the front of the house, a morning room, drawing room, sun-lounge, kitchen and dining room with a bay window on the ground floor and four bed rooms, a dressing room and a bath room on the first floor. The arrangement of rooms closely reflects the two main building phases.

The sun-lounge leads on to a decorative garden pavement embedded in which are three symmetrically placed mill-stones. These are the most obvious physical remains of corn-milling on the site. The central Peak stone is 1.42 m in diameter and the other two are a pair of fine pink stones 0.67 m in diameter. All three are dressed left-handed, the master furrows leading tangentially to the left of the eye. The Peak stone is illustrated in Plate 33. Finally in the yard at the back of the house there is a fine example of a Blackburn cast-iron inspection cover.

## CONCLUDING REMARKS

Although the research upon which this report is based has been extensive, far more information about Catteshall Mill could have been obtained. The relevant Loseley

Manuscripts and the records of Catteshall Manor could have been examined in far greater detail. The unpublished Godalming parish registers for the period since 1688 have not been studied and neither have the registers for the neighbouring parishes of Shalford and Bramley. The window tax records might produce useful information for the 18th century and for more recent events a thorough search for entries in local newspapers would be valuable. For example an employee at the works recollects seeing a newspaper report of the damage caused when the fly-wheel of the beam-engine crashed through the mill wall into Catteshall Road, but the relevant issue has not been found. Also the number of historic photographs of the mill and its employees which have been located is rather disappointing. Again more information could be deduced from the buildings themselves and no attempt has been made to carry out even small-scale archaeological excavations at the site. In particular much relevant material must lie in the silt of the water channel through the mill and in the mill-tail.

Some additional information about Catteshall Mill acquired in the course of this study but not included in this account has been deposited in the Library of the Surrey Archaeological Society. Information has also been accumulated about other mills in the neighbourhood of Catteshall. A comparative history of the development of the six Godalming mills would make an interesting study. Eashing Mill like Catteshall has become an engineering works, Westbrook Mill was until recently a biological research laboratory, Hatch Mill is used for storage, Ockford Mill houses a firm of technical designers and Enton Mill is part of a private house. The development of the industrial activities most recently established at Catteshall would also make an interesting project, as would the story of Catteshall Manor. Again the growth and decline of the leather industry of Godalming is worthy of further study, as is the paper industry in south-west Surrey. Certainly the present investigation has been a very rewarding exercise for those actively involved and it is hoped that its publication will encourage others to record and make available accounts of the industrial history and archaeology of other sites in the County of Surrey.

The authors would welcome information on Catteshall Mill which supplements, clarifies or corrects the account given in this report. Information and queries on other industrial sites in Surrey should be addressed to the Secretary of the Surrey Industrial History Group, Surrey Archaeological Society.

## Appendix

### Research Material Deposited in the Library of the Surrey Archaeological Society

I. Prints of 87 photographs taken by Kevin Shaughnessy of the Audio Visual Aids Unit, University of Surrey on visits to Catteshall Works in September 1975 (a1–45) and July 1977 (b1–42), together with descriptive captions and location plans. (Some of these have been used to illustrate this report.) They show the following:

- the mill-stream including the sluice-gate and its gearing (a1–7, b1–5)
- exterior views of the works (a8–15, b6–8)
- water-wheel scuff marks, the water-turbine and the pit-wheel (a16–20, b9, 10)
- the line-shaft and its belt-wheels (a21–23, b11–18)
- the Crookes-Roberts lathe (a24–26)
- interior views of the Old Beam-Engine House (a27–29, b19–24)
- interior views of derelict part of works including some equipment (a30–39, b25–33)
- interior views of Main Beam-Engine House (b34–37)
- the Blackburn Machine Shop and Foundry (a40–42, b38, 39)
- Catteshall Grange and features in its garden (a43–45, b40–42)

II. Copies of important documents referred to in the text at the page references indicated.

- a *Kentish Gazette* advertisement, 1787 (4pp) (see p9)
- b Highway diversion application and plan, 1836 (4pp) (see p12)
- c Sweetapple patent specification and plan, 1838 (16pp) (see p13)
- d Plan of Catteshall Paper-Mill, 1878 (1p) (see p17)
- e Extracts from *The Paper Trade Review*, afterwards *The World's Paper Trade Review*, 1884–1906 (15pp) (see pp19–22)
- f Minutes of board meetings, Spicer Bros Ltd, 16 and 29 March 1899 (6pp) (see p21)
- g Leasehold sale particulars, 1906 (9pp) (see pp21–23)
- h Freehold sale particulars, including plan, 1910 (11pp) (see pp22, 24, 25)
- i Plan of Farncombe Paper-Mills, 1926 (1p) (see p26)
- j Plan of Catteshall Works, 1942 (2pp) (see p26)
- k Inventory of Catteshall Works, 1951 (97pp) (see pp26–27)
- l Plan of Catteshall Works, 1974 (27pp) (see p28)
- m Proposed Surrey Industrial Museum, 1976 (1p) (see pp28–29)
- n Spicer family tree (4pp) (see p18)
- o Simmons Collection notes on Catteshall Mill (5pp) (see Bibliography)

## Bibliography

The following is a short list of books which provide general background information on the industrial activities which have taken place at Catteshall Mill. The list is sub-divided into general texts dealing with the history of technology, industrial archaeology and documentary research, books concerned specifically with Surrey, those covering particular industries, and finally books on the relevant sources of power. The books marked with asterisks contain inaccurate information on Catteshall Mill and notes on these errors are provided.

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 Buchanan, R A, 1972 *Industrial Archaeology in Britain*, Penguin, Harmondsworth  
 Bodey, H, 1975 *Discovering Industrial Archaeology and History*, Shire, Aylesbury  
 Raistrick, A, 1971 *Quakers in Science and Industry*, David & Charles, Newton Abbot  
 Richardson, J, 1974 *The Local Historian's Encyclopedia*, Historical Publications, New Barnet  
 Gooder, E A, 1961 *Latin for Local History*, Longman, London  
 Dibben, A A, 1968 *Title Deeds*, Historical Association, London  
 Harley, J B, 1972 *Maps for the Local Historian*, National Council for Social Service, London

### Surrey

- \*Manning, O and Bray, W, 1804–14 *The History and Antiquities of the County of Surrey* (3 vols). New edition, 1974 EP, Wakefield.  
 It is stated (1, 615, published 1804) that 'the paper-mill and corn-mill at Catteshall are the property of the right honourable George Earl Onslow'. Evidence suggests that Lord Onslow had sold the mills to Joseph Chandler and John Sweetapple in 1782.  
 \*Brayley, E W, and Britton, J, 1841–50 *Topographical History of Surrey* (5 vols).  
 The principal paper-mill in Surrey is stated (5, appendix, 34) to be 'Sir William Magnay's at Albury, and those of Messrs Pewtress, Warren, Sweetapple, Spicer etc are within five miles of that place'. In fact when Magnay was knighted in 1844 the other four paper-makers were at Eashing, Bramshott, Catteshall and Alton mills at 6, 16, 4 and 20 miles respectively from Albury. By 1852, when Pewtress and Spicer were also at Stoke and Chilworth, 4 miles and 1 mile away respectively, Magnay's Albury mill was in decline.  
 \*Malden, H E (ed), 1902–14 *The Victoria History of the County of Surrey* (4 vols), Constable, London.  
 The errors noted above are repeated (2, 419) and Thomas Downham rather than John Downham Sweetapple is named as partner to Thomas Sweetapple at Catteshall paper-mill in 1823.  
 \*Simmons, H E S, 1940s The Simmons (Water-mills) Collection (Unpublished: 4 vols on Surrey), Science Library, London.  
 Several Westbrook Mill references (Royal Exchange insurance policies of 1794, 1797 and 1798, a London Gazette bankruptcy notice of 1803 and notices of an 1810 sale) are attributed to Catteshall Mill.  
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 Vine, P A L, 1965 *London's Lost Route to the Sea*, David & Charles, Newton Abbot  
 Payne, G A, 1977 *Surrey Industrial Archaeology*, Phillimore, Chichester  
 Withers, H C, 1969 'A Survey of the Industrial Development of Godalming', Surrey County Library, Godalming

### Corn-Milling

- Bennett, R and Elton, J, 1899 *History of Corn-Milling, vol 2, Watermills and Windmills*. New edition, 1973 EP, Wakefield  
 Syson, L, 1965 *British Water-Mills*, Batsford, London  
 Wilson, P N, 1956 *Water-Mills – An Introduction*, SPAB, London  
 Reid, K C, c1959 *Water-Mills and the Landscape*, SPAB, London  
 Vince, J, 1970 *Discovering Watermills*, Shire, Tring

### Fulling

- Baines, E, 1875 *Account of the Woollen Manufacture of England*. Reprint with introduction by Ponting, K G, 1970 David & Charles, Newton Abbot  
 Pelham, R A, c1958 *Fulling Mills*, SPAB, London  
 Jenkins, J G, 1965 *The Esgair Moel Woollen Mill*, National Museum of Wales, Cardiff  
 Kilburn-Scott, E, 1931 Early Cloth Fulling and its Machinery, *Trans Newcomen Society*, 12, 30–52

### Paper-Making

- \*Shorter, A H, 1957 *Paper Mills and Paper Makers in England 1495–1800*, Paper Publications Society, Hilversum  
 It is admitted (239–40) that some of the information given may refer to Godalming (Westbrook) Mill, Catteshall Mill or Eashing Mill and in a few places the tentative location is faulty. It is also suggested that some watermarks bearing the cypher C&S may refer to Chandler and Sweetapple but the dates indicate that this is not possible. However see Fig 4 for a later 'C & S' Catteshall watermark. (Some paper at Guildford Muniment Room (GMR 160/29) said by the donor to be made at Catteshall Mill by the Harrisons has the watermark 1824 when William Harrison & Co were paper-makers at Westbrook Mill.)  
 Spicer, A D, 1907 *The Paper Trade*, Methuen, London  
 Coleman, D C, 1958 *The British Paper Industry 1495–1860, A Study in Industrial Growth*, Clarendon, Oxford  
 Shorter, A H, 1971 *Paper Making in the British Isles*, David & Charles, Newton Abbot  
 Clapperton, R H, 1967 *The Paper Making Machine*, Pergamon, Oxford

### Tanning

- Jenkins, J G, 1973 *The Rhaeadr Tannery*, National Museum of Wales, Cardiff

### Engineering and Foundry Work

- Greaves, W F and Carpenter, J H, 1969 *A Short History of Mechanical Engineering*, Longman, London  
 Gilbert, K R, 1966 *Machine Tools, Catalogue of the Science Museum Collection*, HMSO, London  
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### Sources of Power

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 Wilson, P N, 1974 *Water Turbines*, HMSO, London  
 Buchanan, R A and Watkins, G, 1976 *The Industrial Archaeology of the Stationary Steam Engine*, Allen Lane, London  
 Crowley, T E, 1976 *Beam Engines*, Shire, Aylesbury

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The following abbreviations have been used:

- BL Add Ch British Library, London, additional charters  
*Econ Hist Rev* *Economic History Review*  
*Gdmg Par Regs* Malden, H C (ed), 1904 *Godalming Parish Registers*, Surrey Parish Register Society, 2  
 GL Guildhall Library, City of London  
 GMR Surrey Record Office, Guildford Muniment Room, Castle Arch, Guildford, Surrey  
 LM Loseley Manuscript(s)  
 Manning & Bray Manning, O & Bray, W, 1804–1814 *The History and Antiquities of the County of Surrey* (3 vols)  
 PRO Public Record Office, London  
*PTR* *The Paper Trade Review*  
 SCL(Gdmg) Surrey County Library, Godalming Branch  
 Spicer Spicer, AD, 1907 *The paper trade*  
 SRO Surrey Record Office, County Hall, Kingston upon Thames, Surrey  
*SyAC* *Surrey Archaeological Collections*  
*SyAS* Surrey Archaeological Society  
*Sy Hearth Tax* Meekings, C A F (ed), 1940 *Surrey Hearth Tax*, SyRS 17  
*SyRS* Surrey Record Society  
*Sy Taxn Retns* Willard, J F & Johnson, H C (ed), 1922 *Surrey Taxation Returns*, SyRS, 18  
*Trans Newcomen Soc* *Transactions of the Newcomen Society*  
 VCH Malden, H E (ed), 1902–1912 *Victoria History of the County of Surrey* (4 vols)  
 WD Woods Deeds Collection, SCL (Gdmg)  
 WH Woods Hundred Collection, SCL (Gdmg)\*  
 WM Woods Manuscripts Collection, SCL (Gdmg)\*  
*WPTR* *The World's Paper Trade Review*

\*Note: references to these transcripts include a note of the primary sources, as ascribed by Woods. For documents now at GMR, the full reference is given.

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- 15 WM, 9, 63: Catteshall court roll (GMR LM148)
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- 17 Kilburn-Scott, E, 1931 Early cloth fulling and its machinery, *Trans Newcomen Soc*, 12, 30-52
- 18 *Sy Taxn Retns*, 19
- 19 WM, 9, 8: Catteshall court roll (GMR LM147/1)
- 20 WM, 12, 22: lay subsidy assessment, Godalming hundred, 1380/1
- 21 WM, 9, 52: Catteshall court roll (GMR LM148)
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- 24 WM, 9, 61: Catteshall court roll, 1404/5 (GMR LM148)
- 25 *Sy Taxn Retns*, 19
- 26 WM, 9, 8: Catteshall court roll (GMR LM147/1)
- 27 WM, 9, 47: Catteshall court roll, 1375/6 (GMR LM147/1)
- 28 WM, 12, 22: lay subsidy assessment, Godalming hundred, 1380/1
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- 30 GMR LM338/30/4
- 31 GMR LM340/3
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- 34 WM, 9, 69: Catteshall court roll, 1484 (GMR LM148)
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- 36 WM, 12, 32: lay subsidy, 1485 × 1492
- 37 WM, 9, 76: Catteshall court roll (GMR LM148)
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- 39 WH, 12, 262
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110 GMR 111/10/13; GMR 97/15/34(1)a  
111 WH, 12, 131: rental  
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113 GMR 97/13/408  
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149 WH, 12, 226: lease, 28 April 1829; WH, 12, 95: Knight family tree  
150 SRO QS6/7 Godalming-Catteshall  
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153 GL MS7253/28, no 138928: Royal Exchange Fire Insurance Policy; SRO 2253/10/1, 2: Godalming rate books; *The London Gazette*, 1803, 1604  
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157 SRO QS6/7 Godalming-Catteshall  
158 GL MS11936/340, no 523718: Sun Fire Insurance Policy  
159 GMR 142/1/1, 502: Godalming Navigation Commissioners' minutes  
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161 SRO QS6/7 Godalming-Catteshall; SRO 2253/10/1-6; WH, 6, 593-594  
162 WH, 12, 222: will proved 6 Oct 1795, Surrey Archdeaconry Court  
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164 SRO QS6/7 Godalming-Catteshall  
165 WH, 12, 226: lease 28 April 1829  
166 WH, 12, 225: Sweetapple family tree  
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 253 Plan of extensions to Catteshall Paper Mill, from the archives of Wiggins Construct Ltd (Catteshall)  
 254 Leasehold sale particulars of Farncombe Paper Mills, 27 July 1906, from the archives of Wiggins Construct Ltd (Catteshall)  
 255 Freehold sale particulars of Farncombe Mills, 9 March 1910, from the archives of Reed International (London)  
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 296 Letters from Herbert Spicer to Martha Arnott, in the possession of Mr and Mrs A Spicer of Oxted, Surrey  
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## Indexes of Persons, Places and Organisations

### PERSONS

- Allen, Mr, 6  
 Arnold, James, 14  
 Arnott, Martha, wife of Herbert Spicer, 17, 18, 21  
 Avenell, Jane, 7
- Babbe, John, 4  
 Baker, John, 29  
 Barker, —, Deputy Chief Constable, 19  
 Barrett, George, 12  
 Bennett (Benet, Beneyt), Alice, 19  
   Godfrey, 3  
   John, 4  
 Blackburn, Joseph I., 26, 27, 28, 34, 39, **Plate 11**  
 Bonner, Charles, 22  
 Bradfolde, Thomas, uncle of Wm Penycod, 5  
 Bray, Reginald, 4  
 Brazell, John, 19  
 Bridger, George, partner of Richard, 5  
   Gordon H., 25, 26  
   Richard, partner of George, 5  
 Browning (Bronyng, Brunynges), Nicholas, 3  
   William, 3, 4, 9
- Callingham, John, 6  
 Champion, Arnold, 4  
   Robert, 4  
   William, 4  
 Chandler, Joseph, son of Thomas the elder, partner of John Sweetapple, 8, 9  
   Mary, daughter of Joseph, wife of John Sweetapple, 8, 9  
   Rebecca, wife of Thomas, 11  
   Thomas, the elder, of Merton, father of Joseph, 8  
   Thomas, son of Joseph, husband of Rebecca, 9, 11  
   William, son of Thomas [the younger], 9, 11  
 Chennell, Thomas, and Thomas his son, 4  
 Chitty (Cheteye, Chittie, Chytey), family, 5, 39  
   Mr, 6  
   Widow, 6  
   Dorothy (née Jakis), wife of Samuel, 5  
   Jane, wife of William, 8  
   John, senior, of Eashing, 3, 4  
   John, 5  
   Juliana, 4  
   Samuel, husband of Dorothy, 5  
   Thomas, 4, 5  
   William, *alias* Passhelawe, 4, 5  
   William the elder of Godalming, husband of Jane, nephew of John Trigg, 8, 9  
   William of Godalming, Maltster, son of Wm, uncle of Mary Joyce, 9  
 Clarke, Matthew, 5  
 Cobbett, William, 20  
 Constable, Anne, wife of Benjamin Sweetapple, 8  
 Cullen, William, 31
- Denyer, Elizabeth, daughter of Thomas, 12  
   Henry, son of Thomas, 8, 12  
   Richard, 12  
   Sarah, daughter of Thomas, 12  
   Thomas, son of Richard, 12, 13  
 Dick, James, 21  
 Donkin, Bryan, 13  
   Henry, son of Bryan 13  
   Thomas, son of Bryan, 13  
 du Boulay, Pamela, 28
- Edwards, Hannah, 14  
 Ekman, —, chemist, 19  
 Elyot, Richard, 4  
 Evelyn, George, 11
- Fairhead, David, 29  
 Ferrers, William, 5  
 Farndell, Richard, 5  
 Foster, Andrew Frank, 19
- Fourneyron, Benoit, 31  
 Fuller (Follar, Follere, Fullere), John, 3  
   Juliana, wife of John, 3  
   Peter le, 3  
   Robert le, 3  
   Thomas le, 3  
   William le, 3  
 Furlonger, William, 9, 14
- Gale, Amazda, 22  
 Giles, William, 4  
 Glover, Thomas, 4  
 Goodall, Mr, 21  
 Graling, Robert, apprentice to Robert England, 5  
 Greenfield, Alfred, 25  
 Grover, John, 8
- Hall, Thomas, 9  
 Hardinge, Richard, 4  
 Harrison, Thomas, 9  
   Thomas, son of Thomas, 9, 13  
   William, 9  
 Haydon, family, 16, 18  
   Joseph, 12, 14  
   Samuel, 14  
   Thomas, 12, 14  
   William, 12, 14  
 Heade, Doug, 26  
 Hedger, Ann, daughter of James, wife of John Knight, 8  
   Elizabeth, daughter of James, wife of James Joyce, 9  
   James, 12  
 Hicks, John, 12  
 Hobson, James, [son of Thomas?], 4  
   Jane, wife of Thomas, 4  
   Thomas, son of James, 4  
 Holland, Messrs, 11  
   William, 14  
 Hubbard, John, 5  
   —, wife of Thomas Tydie, 5  
 Hunt, family, 39  
   Agnes, née Penycod, wife of William Hunt[?], sometime wife of — Rapsley, 5  
   Edward, 5  
   Joane, heir of John Penycod, wife of John Trigg, 6, 8  
   Robert, 5  
   William, 5
- England, Robert, 5
- Jakis, Dorothy, wife of Samuel Chitty, 5  
 Jakman, Ann, wife of Humphrey Toft, 5  
 Jarman, Richard, 13  
 Joyce, family, 39  
   Elizabeth, née Hedger, wife of James, 9  
   James, 9  
   Mary, niece of Wm Chitty, 8, 9
- Knight, Ann (née Hedger), wife of John, junior, 8  
   John, husband of Sarah, 6, 7, 8  
   John, son of John, husband of Ann, 8, 9, 11, 12, 13  
   Sarah, wife of John, senior, 8, 9
- Lambert, John, 13  
 Lanewey (Lanawey, Laneweye), family, 4  
   Anne, wife of Thomas junior, afterwards of Henry Wheler, 4  
   Anne, wife of William, son of Thomas junior, 4  
   Emma, 3  
   John, 3  
   John, miller of Catteshall, father of Thomas, 3  
   Richard, 3  
   Thomas, 4  
   Thomas, son of John, 4  
   Thomas, son of Thomas junior, 4  
   William, son of Richard, 3  
   William, son of Thomas, junior, 4  
 Ysote, wife of John, miller of Catteshall, 4

- Lee, William, 9, 14  
 Lees, Mr, 6  
 Love, Dorothy (née Parke), wife of William junior, 5  
   Mr [William], 5  
   William, 5, 6  
   William, son of William, husband of Dorothy, 5
- MacAdam, James and Robert, 31  
 McKay, W. G., 22  
 Marchant, George, 19  
 Marshall, Mrs, 17  
   George, 14  
   H., 12  
   Sarah, 13  
 Mather, Thomas, 4  
 Matilda, Empress, 3  
 Mellersh, Thomas, 11  
 Moline, Henry, prob son of Robert, 11  
   Robert, 11  
 Moon, John, 13  
 More, family, 1  
   Sir George, son of William, 4  
   Sir Robert, son of George, 4  
   Sir William, 4  
   Sir William, 6  
 More-Molyneux, Sir, 6  
   James, 9, 14  
 Mulle, Alice atte, 3  
   Juliana atte, 3  
   Richard atte, 3  
   Robert atte, 3  
   Thos atte, 3  
   see also Wulle  
 Mulleward, John, 3  
   William, son of John, 3
- Neel (Nele, Neyl), Robert, 3  
   William (1415), 3  
   William (1485), 4  
 Nordberg, J. A., 21  
 Nowre, Richard at, 4
- Oliver, C. V., 25, **Plate 9**  
 Onslow, family, 8  
   Arthur, 5, 6  
   Sir Richard, 6  
 Osman Bey, Grand Chamberlain to the Sultan of Turkey, 20
- Park (Parke), family, 5, 39  
   Dorothy, wife of William Love, 5  
   George, brother of Dorothy, 5  
   John le, 3, 5  
 Passhelawe, William, *alias* Chitty, 4, 5  
 Pears, A., 20  
 Penfold, J. W., 16  
 Penycod (Pannycod), family, 39  
   Agnes, daughter of Henry, 5  
   Henry, heir of William, 5  
   Henry, son of Henry, 5  
   Joane, daughter of Henry, afterwards wife of — Rapsley,  
     later wife of [Wm?] Hunt, 5  
   John, heir of William, 5  
   John, son of Henry, junior, 5, 6  
   Oliver, 5  
   William, nephew of T. Bradfolde, 5  
   William, purchaser of Leathers, 5  
 Peto, Edward, 7  
   Philip, son of Edward, 7  
 Plonker, Robert, 4  
 Porteous, George, 19  
 Powell, James, 13
- Quant, W., 25, **Plate 9**
- Rake, Robert de, 3  
 Rapsley, Agnes, née Penycod, afterwards wife of [Wm?]  
   Hunt, 5  
 Ratcliffe, Jane, 7  
 Reed, Albert E., 22, 25, 39, **Plate 5**  
   Ralph, son of Albert, 25  
 Robertson, Duncan Douglas, 21, 22
- Roke, Thomas at(te), 4  
 Rolls, Robert, 12  
   Robert, son of Robert, 9, 12  
 Rommant, Robert, 5  
 Rose, Richard, apprentice of John Knight, 6
- Sartorius, Col —, 21  
 Sheppard, Samuel, 19  
 Shrubbs, Mrs, [? wife of James], 7, 8, 9  
   James, 6  
 Shyre, Thomas, 4  
 Sigar (Syger), John, 4  
   Robert, 3, 9  
 Simmons, Richard, 9, 12  
 Sleigh, G. H., 25  
 Smallpiece, George, 14  
   Job, 14  
 Smith, George, 9  
   William, 19  
 Smither (Smyther), widow, 8, 12  
   Anne, née Tidy, wife of William of Bramley, 6  
   Anne [? wife of William], 6, 13  
   John, 7  
   Richard, 4, 6  
   Thomas, son of William of Catteshall, 6  
   William, of Bramley, husband of Anne Tidy, 6  
   William, of Catteshall, son of Wm of Bramley, 6  
   William [? son of William of Catteshall, husband of  
     Anne], 6  
   William [? son of Wm and Anne], 7  
 Smyth, John, 5  
   William, 9, 14  
 Snelling, Robert, 5  
 Softley, Charles, 16  
 Spicer, family, 16, 39  
   Arthur, son of Henry, 16, 17, 19, 20  
   Augustin, cousin of Edward, 21  
   Edward, son of Henry, 21  
   Edward Samuel, son of Augustin, 21  
   Frederick, son of John Edward, 17, 20  
   Henry, son of John Edward, 16  
   Henry, son of Henry, 16, 17  
   Henry Gage, son of Augustin, 21  
   Henry Revell, son of John Edward, 16, 17  
   Herbert, son of Henry, husband of Martha, 16, 17, 18, 19,  
     20, 21  
   James, son of John Edward, 16  
   John Edward, 16  
   John Edward junior, son of John Edward, 16  
   Martha, née Arnott, wife of Herbert, 17, 18, 21  
   Nicholas, of Exeter, 18  
   Walter, son of Henry, 20  
   William Revell, son of John Edward, 16  
 Stephen, King, 3  
 Stevens, William, 20  
 Stovold, Richard, 14  
 Street, William, 9  
 Sumner, Ann, 14  
 Swan, William, 11  
 Sweetapple, family, 8  
   Alfred, son of Thomas and Susan, 13  
   Ann, née Toft, wife of John [? *alias* Hannah], 8  
   Anne, née Constable, wife of Benjamin, son of Benjamin, 8  
   Benjamin, of Alresford, 8  
   Benjamin, son of Ben of Alresford, husband of Anne, 8  
   Benjamin, son of Ben and Anne, 8  
   Benjamin, son of John and Mary, 9, 11  
   Edward, son of Thomas and Susan, 13, 16  
   Elizabeth, daughter of John and Mary, 9  
   Ellen, daughter of Thomas and Susan, 13  
   George, son of Ben and Anne, 8  
   Hannah, [? *alias* Ann, née Toft], wife of John, 8  
   Hannah, daughter of John and Mary, 9  
   Harold, son of Thomas and Susan, 16  
   Henry, son of Thomas and Susan, 13  
   James, see John Downham  
   Jane, daughter of John and Mary, 9, 11  
   Jane, daughter of Thomas and Susan, 13  
   John, son of Ben and Anne, husband of Ann (Hannah?)  
     Toft, 8

John, [? son of John and Hannah], husband of Mary, 8, 9, 11, 14, 39  
 John, d 1596, 8  
 John Downham, *alias* James, son of John and Mary, 9, 11, 16  
 Margaret, daughter of Thomas and Susan, 13  
 Mary, née Chandler, wife of John, 8, 9, 11, 14, 16  
 Richard, son of Ben and Anne, 8  
 Sarah, daughter of John and Mary, 9  
 Susan, wife of Thomas, 13  
 Thomas, son of John and Mary, husband of Susan, 9, 11, 13, 14, 16, 17, 18  
 Thomas, son of Thomas and Susan, 16  
 William, son of Ben and Anne, 8  
 William, son of Thomas and Susan, 13  
 Syger, *see* Sigar

Toft (Taught, Tofte), Mr, 6  
 Ann, née Jakman, wife of Humphrey, 5  
 Ann, wife of John Sweetapple, 8  
 Henry, 5  
 Humphrey, 5  
 Humphrey, son of Humphrey and Ann, 5  
 Humphrey, son of Humphrey junior, 5  
 Mary, 8  
 William, 4, 5

Trigg, family, 39  
 John, husband of Joane Hunt, and uncle of William Chitty, 8

Twycross, Charles, 12, 13, 14  
 Elizabeth, 13  
 Isaac ('Sir Isaac'), brother of Richard, 13  
 John, 12, 13  
 Richard, 12  
 Richard, brother of 'Sir Isaac', 13  
 William, 9

## PLACES

Allen Wood Mill, Carlisle, Cumbria, 16  
 Alresford, Hants, 8, 28  
 Alton, Hants, 4, 8, 16  
 mill, 16  
 Armagh, N Ireland, 31  
 Asia Minor, 21  
 Australia, 13  
 Aylesford, Kent, 25, 26

Belfast, N Ireland, 31  
 Benfleet, Essex, 28  
 Bermondsey, 13  
 Bootle, Lancs, 16  
 Bosphorus, 21  
 Bradley, Woking, 4  
 Bramley, 3, 6, 12, 40  
 Gosden Common, 12  
 Broadford Mills, Shalford, 26  
 Brighton, Sussex, 25

Cardiff, 22  
 Welsh Folk Museum, 13  
 Carlisle, Cumbria, Allen Wood Mill, 16  
 Catteshall, *see* Godalming  
 Chipping Wycombe, Bucks, 16  
 Cockermouth, Cumbria, 16  
 Cologne, W Germany, 6

Dartford, Kent, London Paper Mills, 22  
 Riverside Mills, 22

Eashing, *see* Godalming  
 East Horsley, 5  
 Enton, *see* Godalming  
 Eynsford, Kent, 16  
 Exeter, Devon, 18

Tydie (Tidy), family, 6  
 Ann, wife of William Smither, 6  
 Anthony, probably father of Thomas, 5  
 Thomas, and his wife (— Hubbard), 5

Walker, Don, 28, **Plate 29**  
 Wandell, Richard, 5  
 Waterer, Thomas, 5  
 William, 4  
 Waters, C., 25  
 Watts, William, 4, 5  
 Were, Robert *atte*, 3  
 Westbrook, John, 5  
 West, family, 6, 8  
 John, 6  
 William, of Wraysbury, 5  
 William of Catteshall, son of William, 6

Wheler, Anne (previously Lanewey), wife of Henry, 4  
 Henry, husband of Anne, 4

White, Arthur, 25  
 Wilde, John, 6  
 Williamson, Ann, 14  
 Windebank, James, 9, 14  
 Winton, H., 25, **Plate 9**  
 Woodger, Richard, 13  
 Woods, Percy, 1  
 Wootton, William, 6  
 Worsfold, John, 12  
 Wulle, Agnes *atte*, 3  
 Alan *atte*, 3  
*see also* Mulle

Yalden, Mr, 6

Farncombe, *see* Godalming

Germany, 13  
 Godalming,  
 Catteshall,  
 Allens *alias* Scrivens, 9  
 Ashpiece, 4  
 Blockhouse *alias* Heathers *alias* Leathers *alias*  
 Parkelands, 5, 7, 8, 9, 11, 12, 39  
 Bridge, 4, 5, 16  
 Brownings *alias* Rollands *alias* Smithers *alias* Whites, 4,  
 5, 9, 14  
 Bullendens *alias* Gardeners *alias* Gussells *alias* Rose and  
 Crown PH, 6, 8, 9, 14, 25  
 Flourhouse, 8, 11, 13, 14, 16, 38  
 Gardeners, *see* Bullendens  
 Gussells, *see* Bullendens  
 Hawkins, 9  
 Heathers, *see* Blockhouse  
 Inmead, 4  
 Jarman's Cottages, 13, 16, 17, 29  
 Knight's Mead, 9  
 Lanawayes, 4, 5  
 Leathers, *see* Blockhouse  
 Leye, 4  
 Little Garden, 4  
 Llanaway, *see* Farncombe  
 manor, 3, 4, 9, 14, 17  
 Mead, 8  
 Merys Croft, 4  
 Millbridge, 4  
 Parkelands, *see* Blockhouse  
 Philpott Field, 8  
 Platt (Plott) le, 4, 8  
 Pond Bridge, 4  
 pound, 17  
 Pound Patch, 14  
 church, 5, 8

- Eashing, 3, 6  
 mill, 1, 3, 5, 9, 14, 16, 40  
 Enton mill, 1, 14, 40  
 Farncombe, 3, 6, 13, 20, 21, 25, 38  
 Coffee Tavern, now Teknis House, 18, 22  
     Llanaway, 4  
 Mission Hall, 18, 22  
 Friends Burial Ground, 8, 14  
 Hallam Road, 26  
 Hatch mill, 1, 3, 14, 40  
 Market House, 8  
 Meadow, 13  
 Meadow House, 20  
 Navigation, 1, 6, 7, 8, 9, 11, 14, 17, 20, 22, 26, 28  
 Ock River, 1  
 Ockford mill, 1, 14, 40  
 Old River, 1, 6, 9, 38  
 Old Station, 21, 26  
 Red Lion Inn, 8  
 Taminish Lodge, 20  
 Unstead Lock, 16  
 Unstead mill, 11  
 Wharf, 13  
 Westbrook mill, 1, 3, 5, 9, 12, 13, 14, 40  
 Weygate House, 20  
 Gosden Common, Bramley, 12  
 Guildford,  
     Cemetery, 19  
     Foundry, 19  
     Friends Meeting House, 8  
     Loseley House, 4  
     Loseley manor, 4  
     mill, 8  
     Rodboro Buildings, 26  
     Yvonne Arnaud Theatre, 36  
 Hambledon, Woodlands House, 20  
 Holland, 6  
 Holybourne, Alton, Hants, 4  
 Hurstbourne mill, Whitchurch, Hants, 16  
 Ilford Mills, London, 19  
 Ireland, 31  
 Kingston upon Thames, 11  
 London, 16, 19  
 London Paper Mills, Dartford, Kent, 22  
 Loseley, *see* Guildford  
 Maidstone, Kent, 22, 25  
     Tovil Mills, 22, 26  
 Manchester, 31  
 Merton, 8  
     Abbey Mills, 22, 25  
 Newcastle upon Tyne, 16  
 Northfleet, Kent, 19  
 Peak District, Derbys, 6, 40  
 Portugal, 21  
 Portsmouth, Hants, 26  
 Reading Abbey, 3  
 Reigate, 5  
 Riverside Mills, Dartford, Kent, 22  
 Saudi Arabia, 28  
 Shalford, 1, 26, 40  
     Broadford Mills, 26  
 Sheetbridge, Hants, 11  
 Sheffield, 22, 27, 38  
 Southsea, Hants, 25  
 Spain, 18, 27  
 Thames River, 1, 5, 6  
 Tovil Mills, Maidstone, Kent, 22, 26  
 Tripoli, 18  
 Turkey, 20, 21  
 Ulster, N Ireland, 31  
 Unstead, *see* Godalming  
 Venezuela, 28  
 Wanborough, 4  
 Wandle River, 22  
 Welsh Folk Museum, Cardiff, 13  
 West Caicos Islands, West Indies, 21  
 West Clandon, 5  
 Westbrook, *see* Godalming  
 Wey River, 1, 6, 8, 13, 14, 16, 20, 21, 22, 29, 38  
 Weybridge, 6  
 Whitchurch, Hants, 16  
 Windsor, Berks, 3, 5  
 Witley, 3  
 Woking, 4  
     Bradley, 4  
     mill, 19  
 Womersh, 4  
 Woodlands, Hambledon, 20  
 Workington, Cumbria, 16  
 Worplesdon, 8  
 Wotton, 11  
 Wraysbury, Bucks, 5

## ORGANISATIONS

- Beckett, Alfred, & Sons Ltd, 38  
 Blackburn, J.I. & Co, 26, 27, 28, 29, 34, 38  
 BP Hydraulics Ltd, 28  
 Bull, John, Transport Co Ltd, 28  
 Chancery Division, High Court, 21, 22  
 County Shades, 28  
 Crookes Roberts & Co, 22, 27, 38  
 de Havilland & Co Ltd, 26, 27  
 Domestic Buildings Research Group (Surrey), 39  
 Donkin, Bryan, Co, 16  
 Ekman Pulp and Paper Co, 19  
 Fairhead, F.C., Ltd, 28, 29  
 Farncombe Paper Co Ltd, 21, 22, 38  
 Foresters, Ancient Order of, 19  
 Friends, Society of, 14, 16  
 Gardner & Co, 31  
 Gartrac Fabrications, 28  
 General Electric Co Ltd, 27, 28, 38  
 Godalming Borough Council, 21  
     Library Committee, 27  
     Sanitary and Drainage Committee, 21, 26  
 Godalming Coroners Court, 19  
 Godalming Main Sewage Board, 20  
 Godalming Naval Club, 18  
 Godalming Navigation Commissioners, 7, 8, 11, 13, 14, 16,  
     17  
 Guildford Coroners Court, 19  
 Guildford Rural Sanitary Authority, 20  
 Hetheringtons, 31  
 Industrial Archaeology Committee, Surrey Archaeological  
     Society, 28  
 London Bankruptcy Court, 20, 22  
 London and South Western Railway, 26

MacAdam Bros, 31, 33  
Man-Equip Ltd, 28  
Moon & Son, Messrs, 16  
Morris, Herbert, Ltd, 38

Ottoman Paper Manufacturing Co Ltd, 20

Petworth House Ltd, 28  
PSM Services, 28

Reed, Albert E., & Co Ltd, 22, 25, 26, 34, 38  
Reed, Albert E., & Co (Newfoundland) Ltd, 22  
Reed Group Ltd, 26  
Reed International Ltd, 26  
Reed Paper Group Ltd, 26  
River Wey Proprietors, Millers and Bargemasters,  
Association of, 14  
Royal Flying Corps, 26

Skinnners, Company of, 9, 14  
Spaulding Russell Ltd, 26  
Spicer, A. & Co, 17, 18, 19, 20, 34

Spicer Bros, 16  
Spicer Bros Ltd, 16, 21  
Spicer & Co, 16  
Spicer, H., & Co Ltd, 20, 21, 22  
Spicer, Herbert & Co, 21  
Spicer, James & Sons Ltd, 16  
Spicer Manufacturing Co Ltd, 21  
Spicers Ltd, 16, 26  
Surrey Archaeological Society, 40  
Surrey Paper Mills Ltd, 21

Tempered Tools Ltd, 38  
Thames Water Authority, 29

Viscose Syndicate, 20  
Vulcansons Ltd, 26

Webber, Mark, Ltd, 26  
West Caicos Sisal Co, 21  
Wiggins, C.S. & Sons Ltd, 28  
Wiggins Construct Ltd, 28  
Wiggins Wessex, 28, 29

**A transcript and translation of the quitclaim of 1321 (Plate 1)**

The Latin text reads as follows:

Omnibus Christi fidelibus ad quorum noticiam presentes litere pervenerint Robertus de Rake de parochia de Wytley salutem in domino sempiternam Noverit universitas vestra me relaxasse et omnino de me et heredibus meis quietum clamasse Thome atte mulle de Catteshulle totum ius et clamium quod habui vel aliquo modo habere potui in uno mesuagio duobus molendinis octo acris terre et octo acris prati cum pertinenciis in Catteshulle iuxta Godalminge unde tuli breve domini Regis proavi coram iusticiariis suis apud Westmonasterium Ita quod nec ego Robertus predictus nec heredes mei nec aliquis nomine nostro versus predictum Thomam heredibus suis vel suis assignatis de dictis mesuagio molendinis terris et pratis cum suis pertinenciis quicquam Iuris vel clamii de cetero clamare seu exigere poterimus in perpetuum In cuius Rei testimonium sigillum meum huic quiete clamancie est appensum datum apud Guldeford die beati Martini episcopi anno Regni Regis Edwardi filii Regis Edwardi quintodecimo hiis testibus Roberto le dol Stephano de Frollebury Johanne randolf Johanne Picard Ricardo de Bursebrige Ricardo Payn Waltero de Munstede Waltero Lelongge Willelmo atte Park Ricardo le curt Roberto atte halle de Muleford et aliis

Translation:

To all Christ's faithful to whose knowledge the present letters will come, Robert de Rake of the parish of Witley [sends] eternal greetings in God. Know you all that I have released and altogether from myself and my heirs quitclaimed to Thomas atte Mulle of Catteshall all right and claim which I had or in any way could have had in one messuage, two mills, eight acres of land and eight

acres of meadow with appurtenances in Catteshall next to Godalming, whereof I brought a writ of aiel of the lord king before his justices at Westminster. So that neither I the aforesaid Robert nor my heirs nor anyone in our name shall ever in future be able to claim or demand anything of right or claim against the aforesaid Thomas, his heirs or his assigns, concerning the said messuage, mills, land and meadow with their appurtenances. In testimony of which thing my seal to this quitclaim is appended. Given at Guildford on the day of the Blessed Bishop Martinus [11th November] in the 15th year [1321] of the reign of King Edward, son of King Edward, with these witnesses: Robert le dol, Stephen de Frollebury, John Randolf, John Picard, Richard de Busbridge, Richard Payn, Walter de Munstead, Walter Lelongge, William atte Park, Richard le Curt, Robert atte Halle de Milford and others.

Note. The writ of 'aiel' (proavus) enabled a plaintiff to bring an action of right, basing his claim on the seisin of his great grandfather. In the Common Pleas roll for Michaelmas term 1321 (PRO CP40/240,m240d), under the heading for the morrow of All Souls (covering business from about 3–7 November 1321), is a plea by Robert de Rake against Thomas de Catteshall for right in the properties described in the quitclaim. The case was immediately adjourned to Easter term, 1322. Apparently, however, the parties straightaway reached a settlement out of court, as the quitclaim, which forms part of this settlement, is dated 10 November 1321, only a few days after the court hearing.

We are grateful to Dr David Crook of the Public Record Office for his help in elucidating the text and meaning of the deed, and for checking the Common Pleas roll for us.