

THE BRICKMAKING INDUSTRY IN KENT c.1825-1900

PETER TANN

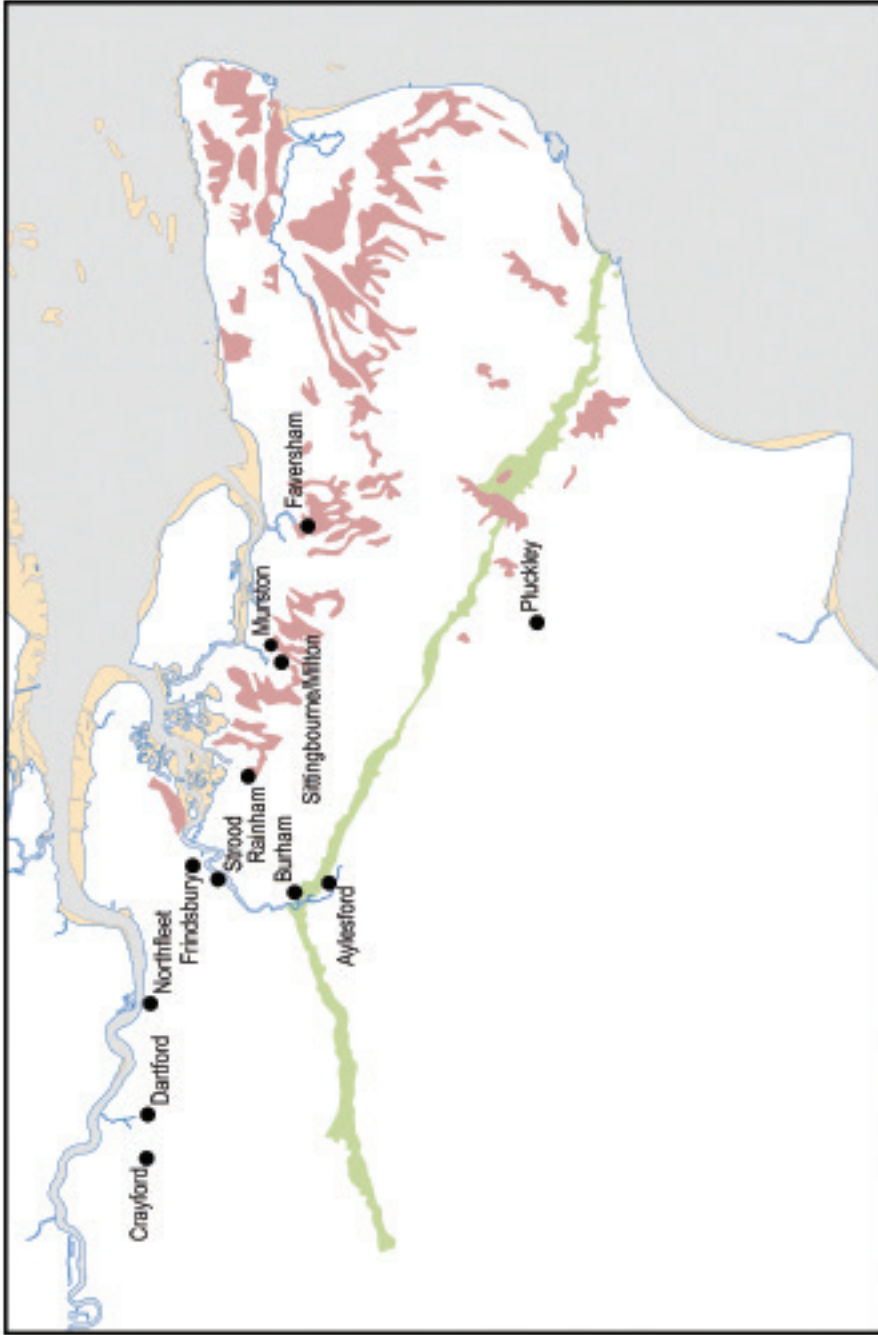
The early history of brickbuilding and brickmaking in Kent is very usefully summarized in Archaeologia Cantiana 136 which examines the use of locally produced bricks in the building of Old St Alban's Court, Nonington (between 1556-1708).¹ This is probably very typical of the pattern of brick use at this earlier period – small-scale for specific building projects by the landed gentry, using locally available raw material.

This new paper, by extreme contrast, is set at the height of the Industrial and the Railway revolutions with population growth at unprecedented levels and the demand for bricks (especially in London) for infrastructure and housing developments now being counted in their scores of millions. It examines the various types of brickmaking businesses created in Kent, illustrated by case studies centred on the Faversham and Sittingbourne districts. Their management, varying character ('model'), strengths and weaknesses and changing fortunes are described and analysed.

The large brickfields, employing hundreds, were the subject of a number of Official Inquiries into their social conditions. The employment of young boys, some under 10, working long hours was prevalent; girls were also employed in significant numbers, seeing this as a better occupation than being 'in service'; drunkenness was rife. This aspect of the history of brickmaking in Kent is not further explored in the paper but references to the detailed Official reports on social conditions are provided in a bibliographic note (below).

Despite its importance, a comprehensive history of the regional brickmaking industry has defied historians. This is because few business sources survive. Most brickmasters did not have a long-term stake in the community and thus did not leave much of a documentary imprint. A field robbed of its brickearth was of no further value to the brickmaster, whereas the landowner had the option to return the topsoil for agricultural use or to sell the land for property development. Typically, the industry went almost completely unrecorded in the administrative records of a town, though some brickmasters are identified in church and poor rate assessments in connection with the houses they built for their workers. With few exceptions, local newspapers tended to cover the economic and social impact of the industry only at those times of stress caused by bad weather or by strikes. Trade directories give no indication of the size and scope of a business.

Bankruptcy records, however, can be extraordinarily valuable. Census records, on the other hand, are too 'high level' to be of much help until later in the nineteenth



Map 1 The scattered distribution of brickearths in eastern Kent and the band of Gault Clay running across the whole county; together with the main nineteenth-century brick manufacturing sites. Map kindly compiled by Chris Blair-Myers using web map services provided by the British Geological Survey.

century. However, the printed reports of parliamentary commissions of enquiry into a wide range of matters yield a surprisingly rich amount of information about the brick industry, in an almost accidental way. The historian can only lament the repeal of the brick tax in 1850, and with it the single best source of production data nationwide, by county and then by tax collection district.

Brickearth, the essential raw material: its distribution in Kent

Fig. 1 shows the distribution of brickearth deposits in Kent and the location of the major production sites. Loessic brickearths are wind-blown periglacial deposits and are clearly very widespread in north Kent. (Apart from their importance to brickmaking, they constitute fine agricultural soils.) Deposits of Head Brickearth vary greatly in depth reaching up to 8-10ft in the most favoured places. The location of the major brickfields clearly demonstrates the vital importance of nearby access to navigable water to allow the export of this bulky and heavy product, usually to London. Also shown in Fig. 1 is the band of Gault Clay across the county which has also supported brick production at a few centres with access to railway.

The brick tax

In 1830 brickmaking was still largely a cottage industry, as suggested by the fact that in that year, the Board of Excise² collected duty from no fewer than 5,369 brickmasters in England. For excise duty calculation purposes, the common brick was not to exceed the standard 150 cubic inches (10 x 5 x 3 inches). (Today's standard brick measures 9 x 4¼ x 2½ inches.) In consequence bricks were made to a more or less standard size; it is this that makes it possible to compare levels of production in different parts of the country before 1850.

After a stuttering start, industrial-scale production (meaning the making of multiple millions of bricks every season from a single brickfield) began in Kent in the mid-1830s. The table below shows that the number of bricks made in Kent in 1845 was nearly double the number made in 1836. But between those dates, production of bricks in Middlesex outstripped that of Kent and Essex combined.³

To put the size of the brick industry in the South-East in the 1830s into sharp perspective, however, let us remind ourselves that brickmasters in Lancashire, Staffordshire, and Cheshire paid duty on a total of 503 million bricks in 1836.⁴ In 1840, the aggregate production of bricks in the three south-eastern counties represented about 27% of national production.

TABLE 1. BRICK PRODUCTION IN SELECTED SOUTH-EASTERN COUNTIES 1836-1845 (MILLIONS)

	1836	1838	1839	1840	1841	1842	1843	1844	1845
Essex	42	42	49	49	56	61	38	45	49
Kent	88	83	102	117	106	128	119	121	166
Middlesex	173	169	183	208	190	202	180	221	289
<i>Total</i>	303	294	334	374	352	391	337	387	504

For administrative reasons, the Board of Excise divided Kent into two ‘collection’ districts. Every parish in Kent was deemed to fall within either the Rochester or the Canterbury collection. The Rochester collection district was much larger extending as far east as Sittingbourne and included the north Kent riverside brickmaking towns and parishes of Strood, Frindsbury, Rainham, Northfleet and Dartford; Faversham was within the Canterbury collection. Unfortunately, parish data relating to brick production are now lost, but at the aggregate level, the records for the years from 1829 to 1849 (below) show, not surprisingly, that production in the Rochester district greatly exceeded that of the Canterbury district.⁵

TABLE 2. BRICK DUTY PAID IN SELECTED YEARS IN THE EXCISE COLLECTION DISTRICTS OF ROCHESTER AND CANTERBURY (£).⁶

	1829	1839	1849
Rochester	14,325	24,173	32,285
Canterbury	3,342	4,716	5,967

THE BEGINNINGS OF INDUSTRIAL-SCALE BRICKMAKING IN FAVERSHAM AND SITTINGBOURNE AREAS

The earliest documentary evidence (that the author has found) of a substantial brickfield in Faversham, dates from 1808. It relates to a lease of nearly five acres, bounded on the south by ‘the turnpike road called the London Road’ and on the west by the road into the town today called the Mall. The lessee was James Knowler, a brickmaker who may already have been in occupation of the land, ‘part of which is now used as a brickfield’.⁷ Knowler went bankrupt in 1817 and we do not know if brickmaking on the site was continued.

However, in 1825 local newspapers reported a flurry of new activity in the Sittingbourne and Faversham areas:

The present speculative age for the manufacture of bricks occasions considerable interest at places where new brick-yards have been established. At Milton [Sittingbourne], a little town of cottages has been erected within these last four months for the convenience of workmen; and a short time since there were thirteen colliers in the Creek at one time, laden with coals and cinders. (Cinders were a key ingredient in the making of *stock* bricks – see below.) An iron rail-road has also been formed, a quarter of a mile in length, communicating the landing wharfs with the brick-yard, for the purpose of additional facility. At Faversham also great bustle has been created by the manufacture of bricks, but unfortunately much inconvenience arises from the bad state of the Navigation [known locally as the ‘Creek’]. An immense kiln of excellent bricks has already been burnt containing *one hundred and seventy-three thousand*; and a clamp is now forming to consist of upwards of *eighteen hundred thousand*.⁸

We do not know the location or ownership of the brick-yard at Faversham described here. The detailed production figures lend a sense of veracity to the story, but the reference to ‘an immense kiln’ and ‘a clamp’ suggests caution, for reasons we shall

discover. Importantly, the reference to the creek implies that the bricks were made for the 'export' market, probably London.

A letter to the *Kentish Chronicle* dated 25 February 1825 described a different brick field 'speculation' (*sic*), located alongside the line of a proposed canal from Faversham to the Swale designed by Thomas Telford in 1824. The author, who signed himself 'Navigator', calculated that at 3*d.* per 1,000 bricks and 2*d.* per ton on vessels, the brick trade would bring net additional revenue of £200 p.a. to the navigation. The likely growth in the consumption of bricks made the project 'so desirable', and the revenue 'so certain' that it was threatened only by the depopulation of the town and its neighbourhood.⁹

It is probable that this second brickmaking 'speculation' was that which was the subject of a lease of 'pasture and meadow' land in the Brents, across the creek from Faversham town, in the parish of Preston. Like so much land in east Kent, this was owned by the Dean and Chapter of Canterbury Cathedral; we deduce that in 1825 it was still undeveloped.¹⁰ The tenant was Thomas Waller who sub-let fourteen acres in the Upper Brents and twenty acres in the Lower Brents to a partnership of entrepreneurial Faversham businessmen: John Perkins (timber merchant), Edward Cobb (grocer), and John Little (auctioneer). Although their occupations do not suggest any relevant experience, they intended to produce three million bricks a year.¹¹ This was not a particularly ambitious number. A rule of thumb, cited by John Middleton in 1798, was that one acre of brickearth a foot deep would make a million bricks of the usual size. This measure was still used by the Surveyors' Institution in 1899.¹²

Brickmaking on the Brents site got off to a very slow start; it was delayed for at least two years by a dispute between Waller and the Dean and Chapter.¹³ It was also hit by the countrywide banking crisis of 1825, which slowed speculative building activity. Furthermore, Telford's canal was never built. Nevertheless, some bricks were produced, as shown by the first of two undated maps lodged together with Waller's lease. Map No. 1 shows four pits having been dug 'for raising brick earth'. It shows a terrace of six cottages and a short canal to the Faversham creek for the purpose of shipping bricks but 'having no backwater is constantly filled with mud and ... considered useless'. For reasons unknown, the partnership of the three Faversham tradesmen was dissolved by March 1828.¹⁴

But this does not mean that brick production on the land ceased. Map No. 2 appears to have been drawn at the same time as No.1, but it tells a different story – 'intended improvements', including the site of thirty-three planned cottages and gardens in the Upper Brents. According to Edward Crow, a contemporary Faversham diarist, the building programme started in 1829.¹⁵ By 1835, Waller was assessed for Poor rates as the owner of 'many' cottages in the Brents, and in 1845 for no fewer than ninety-five cottages; we deduce that most of these, if not all, were built to accommodate brickmakers.¹⁶ In 1842, the Poor Law Commissioner reported favourably upon local housing conditions: 'in the neighbourhood of Faversham, the usual cost of building cottages made of brick varies from £70-£100. They contain four rooms and a wash-house and are rented at from 1s 6d to 3s a week'. Those in Sittingbourne had a garden of one-eighth of an acre, an early physical indication of that town's need to attract more workers, perhaps.¹⁷

Waller may not have been a brickmaster himself, but his very large investment in

housing demonstrates that he took a positive view of the prospects for brickmaking over the two decades following his first foray into the industry.¹⁸

Housing developments and census returns signal brickmaking growth

Housing development at this period is a valuable indicator of industrial activity. The Municipal Corporations Act commissioner for Faversham reported the great number of houses recently built in 'Brent Town' in 1835.¹⁹ He recommended that this part of Preston parish should be brought within the new borough of Faversham. 'It is not unlikely [that these houses] may contain a class of occupants over whom it would be desirable that the magistracy and police of the town should have jurisdiction'.²⁰ He was not referring to the existing communities of oyster dredgers or those who worked the creek navigation; the new occupants were almost certainly *brickies* and his recommendation was probably based upon their reputation for bad behaviour.

The 1841 Census Report added little of interest. Labourers (as opposed to 'agricultural labourers') were largely undifferentiated as to the nature of their work, so we have no idea as to the numbers who worked in the brickfields at that date.

The Census Report for 1851, however, included a section regarding the changes in population and the number of houses between 1801 to 1851, as recorded in the census returns.²¹ Significant changes warranted an official explanatory footnote. In the case of the parish of Preston, for example, the footnote reads: 'the increase of population since 1831 is attributed to the building of houses on Davington Hill and at Brent Town'.

By the time of the 1851 census, the catch-all 'labourers' was segmented. It recorded seventy-one brickmakers in the Milton registration district, and twenty-three in that of Faversham.²² These numbers seem hopelessly low, and we can only conjecture the reason.

The 1861 Census Report, however, prompted official footnotes about the impact of the brickmaking industry on the population increase since 1851:²³

The attractions of Sittingbourne and the district generally, and the improved railway accommodation, have given a great impulse to building; and large brickfields, employing many additional labourers are in active progress in Sittingbourne, Tonge, Milton, Rainham, Upchurch, Lower Halstow etc.

In the northern part of Preston-next-Faversham extensive brickfields have lately been opened causing the erection of several labourers' cottages. In Luddenham the decrease in population is attributed to migration caused by the demand for brickmakers in Faversham and other parts of the county.

The 1871 census reinforced the point; it showed a significant increase in the population of the Faversham registration district, up from 18,867 in 1861 to 22,238 (+18.4%).²⁴

The population figures for the census registration districts of Faversham and Milton, 1861-1911, show that the greatest growth occurred in the decade to 1871.

TABLE 3. POPULATION FIGURES FOR THE CENSUS REGISTRATION DISTRICTS OF FAVERSHAM AND MILTON, 1861-1911

	1861	1871	1881	1891	1901	1911
Faversham	18,867	22,238	24,956	25,770	26,426	24,748
	+2,183	+3,371	+2,628	+814	+656	-1678
Milton	14,775	19,236	23,270	24,968	28,169	28,314
	+2,750	+4,461	+4,034	+1,696	+3,203	+145

Changes in population were not caused exclusively by the brickmaking industry, of course. But at this very high level, it is still possible to discern some correlation between brickmaking and population change. Faversham's rate of population growth slowed down considerably in the decade after 1881, when brickmaking slumped. That Faversham did not keep up with the industry's improvement in the second half of the 1890s is reflected in the fact that in the decade to 1901, Milton's overall population (up 13%) overtook that of Faversham for the first time (up 2%). Faversham's role as a place for industrial-scale brickmaking was more or less over by 1901. Faversham's population *declined* in the first decade of the new century. In this same decade, the number of people engaged in the brick and tile making industry in the whole county of Kent declined by nearly 38% from 5,135 to 3,305.²⁵

The provision of housing by a brickmaster was not a philanthropic gesture. It tied the brickies to the business and maximized their working hours. Consequently, hundreds of terraced cottages were built in the period 1840-1880 in east Kent. Where they exist today, or where they are shown on nineteenth-century maps, the rows of cottages are a good finding aid for the location of brickfields, because they were built as close as possible to where the bricks were made.²⁶

In 1865 Sittingbourne's George Smeed, by then the largest brickmaker in the county, stated that 'All who work in my fields live in cottages which I have built for them; the men bind themselves under agreement for the year... I also give each of them a plot of land on which they grow potatoes and other vegetables'.²⁷

INDUSTRIAL SCALE BRICKMAKING TAKES OFF—THANKS TO LONDON AND THE BARGE

Industrial scale brickmaking in the region would simply not have been a commercial proposition were it not for the pull of London and its accessibility by barge. East Kent's long tradition of supplying heavy or bulky agricultural goods to London by sailing barge served its brick industry well. In turn, London's network of rivers such as the Lea, and inlets and canals (many now filled in), allowed Thames barges to deliver bricks to 'inland' construction sites as far upstream as East Molesey, for example. The barge remained the practical mode of transport of bricks to London throughout the nineteenth century, notwithstanding the occasional accident.²⁸ Unfortunately, no official records concerning the shipment of bricks seem to have survived; it is possible that they were not kept, either by port or by shipper.²⁹

Nothing better describes the symbiotic relationship between brick and barge than the name 'George Bargebrick', by which Sittingbourne's George Smeed was known. He successfully combined his brickmaking business with that of building

and operating barges.³⁰ Smeed Dean & Co. (incorporated in 1876), carried bricks from Murston to London by barge well into the twentieth century. Their *Elsie*, bound for Hammersmith, collided and sank with her cargo of bricks in 1923.³¹

Kent barges accessed London from its coastal creeks. Milton creek served the brickfields of Sittingbourne and Murston. Conyer creek served the brickfields of Teynham and Tonge Mill via private tramways. Butterfly Wharf, located where Conyer creek meets the Swale, served the Conyer Brickworks owned by the very large and acquisitive Eastwood & Co. a lime, cement, and brickmaking company, based in Lambeth.³²

Faversham and Oare creeks served the Faversham area.³³ But their utility did not compare with that of Milton creek. Faversham creek was long, muddy, and tortuous. We need only to read the *preamble* to the Faversham Navigation Act of 1842 to see the nature of the problem:

Whereas great obstructions and difficulties are at present occasioned by the navigation of the creek, as well by the sinuosities and irregularities in depth and width of various parts of the said creek, as by the accumulation of mud and sand and the formation of inconvenient banks and shoals, and *whereas* it would be of great public utility if said obstructions were removed and the navigation of the creek otherwise improved ...

Despite improvements to Faversham creek, it still did not compare well with that of Milton. By 1900, Milton creek presented this picture, as remembered by a local author:

'In the old days there was an enormous barge traffic on Milton creek, sailing to and from the Kentish brickfields, and many a well-known barge was launched into its tidal waters. Fifty years ago it was a not uncommon sight to see as many as *forty* laden barges leave on one tide'.³⁴

Faversham creek never matched such a tonnage on one tide. This was demonstrated by E.T. Coulter, who represented the East Kent Barge-owners' Association at Faversham in 1879 (when the brick industry was at its peak). Coulter told a Parliamentary enquiry that there were 180 sailing barges from Faversham and that a round trip to London from Faversham took two weeks.³⁵ This makes 4,680 voyages a year, 2,340 of them out-bound. Assuming no down-time, and a six-day working week, the average number of laden barges leaving Faversham creek on one day would be about eight.

Transportation of bricks by rail was never a practical alternative for the Kent brickmaster who had easy and inexpensive access to the barge. But as the network grew over time and as rolling stock became more robust, rail became the transport of choice for brick and tile manufacturers in the upper Medway valley and central Kent.³⁶ When there was a cyclical decline in demand for bricks in the 1880s, anxious brickmasters in east Kent were keen to offer customers the choice of transport by rail *or* barge.

The London stock brick

The region's leading product was the *London stock* brick. It was a dull brownish

yellow, suggestive of stone; its colour was achieved by adding ash and chalk roughly in the proportion 64% brickearth, 25% ash, and 11% chalk. Throughout most of the nineteenth century, stock bricks were made and dried under the crudest of operating conditions, and invariably by hand. Consequently, they were never a consistent colour (the over-burnt ones could be dark purple), hardly ever square or true, usually pitted, and always flecked with black spots arising from the ash in the mix. Some held that the addition of ash rendered the brick 'very porous, greatly weakened and generally shaky'.³⁷ The stock brick was useful but not beautiful, and on high-status buildings was used only for internal brickwork.³⁸

This is not to imply that high quality red bricks were not made in east Kent. Faversham's red bricks, for example, are to be seen in the town's Almshouses (1860), in the Alexander Centre in Preston Street (1860s) and Rigden's range of brewery buildings (1874-84). Sittingbourne's High Street contains many fine buildings beautifully built with red bricks. Faversham was also good at 'specials': relatively small runs of profiles, decorative bricks and tiles that show craftsmanship and artistry. But these examples do not reflect the town's industrial-scale brickmaking; rather, they represent the town's artisan makers.³⁹

The brickmaking process

The 'stool' was the basic unit of production. Each stool was, in effect, a factory.⁴⁰ This is where the 'moulder' would make his bricks. He and the clamp-setter (the man in charge of baking the bricks) were the most highly skilled workers. The raw material was brought to him, and moulded bricks taken away for drying by his team of seven or eight workers, including children. In a good season, the production of 1,000,000 bricks by one moulder sitting at his stool would be considered excellent. In 1877, however, an east Kent newspaper reported that 1,200,000 or even 1,300,000 bricks were made at one stool, and that the combined output of the Sittingbourne and Faversham districts was over 200 million, of which Sittingbourne's Smeed Dean alone made 60 million.⁴¹

Drying: kiln or clamp?

Kent's stock bricks were typically dried in the traditional way by slow baking in a 'clamp', a temporary structure that was made of about thirty long rows of unfired bricks built in the shape of an inverted 'V'.⁴² Wood was the main fuel for the fire. Spaces were left between the bricks to facilitate the passage of air under the clamp to allow the even combustion of the fuel. Keeping the fire burning, evenly and slowly for a long time called for much experience and expertise. An unexpected frost or excessive rainfall could be fatal to the process.

This traditional method, however, avoided the capital costs of building a permanent kiln, and reduced operating costs because wet bricks could be dried very close to where they were made, instead of moving them to a (perhaps distant) kiln. The ash and cinders content of the raw brick contained unburnt gases that helped dry the bricks in the process of baking. The fact that the ash was brought 'free' from London by an otherwise empty barge made the production of the London stock brick doubly cost-effective. The merit of mixing ash to brickearth had been known to Kentish brickmasters in the late eighteenth century.⁴³

Ignoring the matter of the noxious fumes given off by London's rubbish,⁴⁴ the disadvantage of the clamp was that the drying process was much slower than in a kiln. It was reckoned to take between four and six weeks before a green brick was dry enough to go into either the clamp or the kiln.⁴⁵ Kiln-dried bricks were ready for delivery within a week.⁴⁶ The clamp brick, however, was not ready for three or four weeks, during which time much could happen to impair the value of the finished product. This meant that the typical Kent brickmaster incurred not only greater risk, but also had to fund his inventory for an additional two to three weeks, giving him potential cash-flow problems.

Parliamentary Commissioner H.W. Lord's interviews with the managers of two Faversham brickworks in 1866 provide further details of brickmaking.⁴⁷ Mr Wilson was the manager of George Wythes's brickfield at Abbey Fields. He had been in post for four years, and before that he had managed a field in Sittingbourne for fourteen years. Altogether, he had been connected with brick making since 1825:

Wythes's is a very decent field; the men are unusually steady and respectable. There are sixteen stools here [in Faversham] ... that will make our total number at the stools over 120 [locations not given]. We have already (by 15 August) made twelve million bricks this year ...

The table below is compiled from data provided by the managers of brickfields in Kent interviewed by Mr Lord. It demonstrates the dominance of George Smeed in the London stocks sector, and it suggests that his business alone made twice as many bricks as were made in Faversham.

TABLE 4. THE MAJOR BRICKFIELDS OF KENT 1866

Brick Works	Stools	Employees		of these:
		Male	Female	Age <13
Aylesford & Burham Brick Works	20	289	2	6
Burham Brick & Cement Co (brick only)	n/a	507	16	40
Aylesford Pottery (drainage pipes etc.)	n/a	203	0	7
Smeed, Sittingbourne	59	500+	yes	yes
Scott, Murton	9	n/a	yes	yes
Ashenden, Sittingbourne	10	n/a	yes	yes
Wood, Sittingbourne	16	n/a	12	25
Wythes, Faversham	16	85+	35	yes
Kingsnorth, Faversham	14	n/a	very few	yes
Lucas Bros. Crayford	32	256	48	11
Rutter, Crayford	n/a	332	50	27

INDUSTRIAL SCALE BRICKMAKING EXPANDS RAPIDLY c.1860-1880

Sittingbourne and Faversham were exposed to more or less the same external demand factors. For example, construction work associated with the East Kent

Railway (EKR) in the late 1850s was a stimulant to the industry in both towns. Insofar as the railway tended to boost the population of a town, the need for more houses increased the local demand for bricks. The construction industry was dominated by huge public utilities and transport infrastructure projects. The size of these projects and the impact of demand for bricks is nowhere better described than in the 'Return' to Parliament made by Joseph Bazalgette, chief engineer to the Metropolitan Board of Works in 1863.⁴⁸

Bazalgette sought to explain to Parliament the reasons for the increase in the cost of construction of London's Main Drainage project. He blamed the 'unprecedented' number of very large-scale projects underway at the same time, being the Metropolitan Railway, the London, Chatham, and Dover Railway (successor to the EKR), the Charing Cross Railways and other Metropolitan works and improvements. He wrote that 'The demand has necessitated the introduction into the London market of bricks of a different make, from places remote from London, at a considerably increased cost'. The same report cites two small transactions with east Kent firms as an indication of upward price pressure: in January 1860, Faversham's Thomas Kingsnorth supplied 150,000 bricks at 27s. per thousand, and in February 1861, George Smeed supplied 686,000 'best picked stocks' at 40s. per thousand.

In response to the favourable market conditions, extensive brickfields were opened in Faversham in the 1860s, most notably by George Wythes (above), who rented forty-two acres of brickearth land (part of Abbey Farm) from Lord Sondes.⁴⁹ Brickfields were opened in the adjoining parish of Preston, on land owned by Major Hall, the gunpowder manufacturer: one field was operated by Charles Wood of Milton (est. c.1850), a second by Messrs. Court and Pryer, and a third by William Monk, a Faversham man. London speculators also moved into the industry.

The demand for bricks remained strong to the end of the next decade. In March 1878, *The Builder* printed a very positive summary of the industry at Sittingbourne and Faversham: 'The prospects for the future are even more promising than they have been in the past'. Fears that local brickearth was exhausted had proven mistaken, and valuable new finds were found conveniently close to existing brickyards. 'Landowners from whose fields the brickearth is being taken are making almost fabulous profits ... [getting] out of their land double and treble the sum the land originally cost them, still, of course, retaining their ownership of the land'. The expectation was that in 1878, more than 300 million bricks would be made in the Sittingbourne and Faversham district.⁵⁰ In 1879, when the industry was at or near a peak, it was estimated that London's annual consumption of bricks was 700 million.⁵¹ If these figures were correct (and *The Builder* was a reputable source), then almost half of all bricks used in London c.1880 came from east Kent.

INDUSTRIAL SCALE BRICKMAKING DECLINES RAPIDLY: c.1880-1895

The optimism of the late 1870s was misplaced. The 1880s were years of almost unrelieved depression for the region's brickmaking industry. Kent and Essex brickmasters faced competition from the Midlands and from Belgium. Prices were abnormally low in the middle years of the decade; bad weather almost stopped some fields in 1888.⁵² In the course of an enquiry into the issue of over-production, Mr Tassell, a senior Faversham solicitor, stated that 450 million stock bricks were

made each year in north Kent and south east Essex, of which 120 million came from places within three miles of Faversham.⁵³ If Tassell were right, and even allowing for possible differences in the definition of ‘the district’, the figure was very far short of the 300 million estimated in 1878 by *The Builder*. We should note that the last two decades of the nineteenth century in England were characterized by agricultural depression and falling values in a range of asset classes. Let us explore the characteristics of success and failure in the brickfields.

Industrial-scale brickmaking – the capital investment required

So how much capital did the brickmaster need (measured in terms of shareholders’ equity plus capacity to borrow)?⁵⁴ There is no exact answer to the question, but brickmaking was an industry that turned its inventory only once a year and thus did not generate cash quickly. The industry was subject to the vagaries of the weather (rain would stop production and a severe frost could destroy a million unburnt bricks). Even in a normal year, the brickmaster had to allow for a significant proportion of poor quality bricks that he had to sell cheaply. In June 1854, *The Builder* printed a letter outlining the detailed costs of making 1,000 bricks; the writer concluded: ‘I do not believe that good stocks can be sold at less than 28s. per thousand to yield a profit of 20 per cent, which a manufacturer is fully entitled to, *who only turns his capital once a year*’.⁵⁵ The same writer overlooked the fact that in times when the market was soft, the brickmaster had to carry his unsold bricks over to the following year. He also excluded the cost of transport from his calculations. Clearly, brickmaking was a slow and risky business. The real answer to the question about the amount of capital required is that it depended very much upon the capacity in which the brickmaster operated: was he a committed businessman (like Smeed), who was a consolidator with a long-term stake in the local community, or was he a ‘contractor’, or was he a ‘speculator’?

The brickmasters: consolidators, contractors, or speculators?

Smeed was an example of a *consolidator*. He had a stake in his local community. He consolidated his business by the creation of new fields, by acquisition and by investment in related businesses, in plant and in people. Eastwood was another consolidator in the brick industry who took advantage of the industry decline the 1880s. Like Smeed, he was also a large-scale barge builder and barge operator. In addition to expanding his own estate in Kent, in the 1880s he brought together east Kent brickmakers in Teynham, Lower Halstow and Frindsbury, with others in Suffolk and Essex.⁵⁶ We shall see that his interest in Faversham brickmaking at that time was short-lived and opportunistic – an indication, perhaps, that in the depressed period of the mid-1880s, Faversham was seen, by then, to be a marginal producer, with less favourable prospects.

Contractors were people who undertook large-scale building and infrastructure projects (such as railways). For them, a brickfield was a temporary ‘upstream’ investment, with the primary aim of securing a guaranteed supply of bricks at producer prices.

The two examples that follow have to do with the London Chatham & Dover

Railway (LCDR), whose senior directors were well-known figures from east Kent. It was chaired first by Lord Sondes and then by Lord Harris, both of whom lived near Faversham.

The first example is that of George Wythes (1811-83). We have heard from his manager in Faversham through the report of Mr Lord. Wythes came from a Worcestershire family and became well-known as a national and international railway contractor. He made his reputation, and his first fortune, as contractor to the Eastern Counties Railway (ECR), opened in 1843, from London to Chelmsford. He was then aged only thirty-two. As we have seen, Wythes later became the contractor to the Chappel Viaduct over the Colne, on a branch line of the ECR. It has 32 arches of about 30 feet span, it is 1,066 feet long, and the track is about 80 feet above ground level. The viaduct is built of brick. The relevance to our story is that he established a brickfield within a mile of that viaduct where he made five or six million bricks. Before going to Faversham, Wythes had been appointed contractor to the Sheerness Railway and to the stillborn project of a rail link between Strood and Maidstone.⁵⁷

Attracted by the planned extension of the railway line from Faversham to Canterbury East, via a long tunnel under Boughton Hill, Wythes *contracted* to supply the necessary bricks. His choice of a site reflected his prior experience. He rented a portion of Abbey Farm, contiguous with both Faversham Creek and the branch railway line from Standard Quay to the new Faversham station. The *Kentish Gazette* recorded that 'It is said that four hundred men are to be set to work immediately, and it is intended to make seventeen million bricks a year'.⁵⁸ By 1869 Wythes owned thirty-seven cottages in East Street, Faversham.⁵⁹ He was still described as the owner of extensive brickfields at Faversham in a court case in November 1879.⁶⁰ But at the time of his death in 1883, the Abbey brickfield was in the hands of Henry Chambers. Whether under the control of Wythes or Chambers is not clear, but by 1887 the acreage of the Abbey brickfield had been extended to seventy-eight acres from forty-two in 1860.⁶¹

The second example of the contractor is Joseph Cubitt (son of Sir William), chief engineer and contractor to the LCDR. Cubitt had a fine understanding of his role. The LCDR's survival depended upon the rapid construction of a line from Strood (across the Medway from Rochester) to Victoria and Blackfriars stations in London. Leaving aside the need for a new bridge, the challenge was to complete the Sydenham tunnel beyond which the line would divide to reach both stations. The following extract is from Cubitt's report to the LCDR directors, dated August 1861. It describes the mutual benefits obtained from a tied relationship between client and engineer / contractor. Note the use of steam machinery...

The cutting at the east end of Sydenham Junction adjoins a large brickfield (sixteen acres) established by LCDR, now fully working; brick making both by hand moulding and steam machinery is being carried out upon the largest scale and with the utmost rapidity...

At the west end of the tunnel the essential work of brickmaking is being energetically carried on, ten acres of land being appropriated to the purpose and fully supplied with steam machinery and appliances of every kind. In fact, every means is taken and no expenditure spared for securing the supply of bricks, on the regularity and sufficiency of which the whole question of time depends'.⁶²

Speculators, on the other hand, had no established customer relationships, and no fixed channels of distribution; they were likely to sell to, or through, intermediaries.⁶³ Speculators looked for a quick return on their money and, as a rule, were less likely to invest in capital equipment or to adopt new technology.

The repeal of the Excise duty on bricks in 1850 had the unintended consequence of attracting under-capitalized adventurers into the industry.⁶⁴ This was because the law had required that duty be paid on the number of bricks made *before* firing. Firing was at the owners' risk, so any accident in the firing process meant the cost of the duty was lost. The repeal of the tax eliminated this major financial risk and encouraged speculation.

The Faversham Brickfields Company, based at Uplees, near Faversham is just one example of the speculator. Crucially, it was financed largely by debt rather than by permanent share capital. This new company took over the assets of an existing business, sometime in late 1878, when the market for bricks was buoyant. The company benefited from the fact that the 'machinery' was in working order, and that preparations for brick making in the next season were already in progress. On these grounds, the company's bonds were promoted in a journal called *The Limited Liability Review*:

There can be hardly any doubt that the profits from the very outset will be large, as the position of the brickfields is such as is rarely equaled, and the quality of the brick making materials has been thoroughly proved.

Cautious investors, however, would have been wary of the generous 10% p.a. interest rate attached to the bonds. They were issued at £25 each and by March 1879 were changing hands at a premium of up to £1.⁶⁵ They were still traded in the secondary market in the City in 1881, but in February 1882 a petition for the winding up of the company was made. It could be that the investors in the company simply got their timing wrong: they came in near the top of the market and were caught out by the decline in demand for bricks after 1880. But a properly financed business (more capital, less debt) with a good product and experienced management would have been better equipped to survive the downturn.

Mechanization

The assertion that speculators were not likely to invest in capital equipment and new technology, should not imply that long-established successful brickmasters were early adopters of mechanization. How open were the region's brickmasters to innovation? Did they invest in the new brickmaking machines introduced by British, German, and American firms in a period that saw great advances in industrial engineering?⁶⁶

There were two sorts of brickmaking machine developed in the mid-nineteenth century: one employed moulds into which dry clay was forced and shaped; the other in which moist or plastic clay was forced through a die in the pug-mill in a continuous string, and cut off by wire to the required size. By the early 1890s, the American Kennedy machine had an advertised daily capacity of 26,000 'sharp-edged, solid' bricks that worked with any type of clay, irrespective of what material might have been mixed with it.⁶⁷ The machine-made brick was more consistent in

shape and size than the hand-made brick, making it possible for builders to source their supplies from different makers.

There is very little evidence that respected East Kent brickmasters were quick or keen to adopt new methods of production.⁶⁸ But they were not alone; brickmaking seems to have been a particularly backward industry. Some traditional brickmasters even adopted strategies to thwart mechanization by others, and in this, the workers collaborated with their masters.⁶⁹ Consequently, the building trade was complaining about the problems caused by the variation in the size of bricks as late as 1896.⁷⁰ Yet in 1899, a local publication wrote ‘all Sittingbourne bricks, by the way, [are] made by hand’, as if it were still a craft industry.⁷¹

The firm of Eastwood (see above) invested in American machinery and German kilns made by Krupp at its new Conyer works in 1885.⁷² But Eastwood was the exception to the rule. Indeed, the failure of the industry in Kent and Essex to invest in modern methods of making bricks brought about its long-term demise. At the time of the bargemen’s strike in 1890 (below) Kent and Essex brickmasters found it impossible to agree to higher transport rates on the grounds of their already high manufacturing costs. *The Builder* put it thus:

The masters urge that they have to meet a new and yearly increasing competition with the machine-made bricks, which at the present time are being offered in the market at a price for which it is impossible to make clamp-burnt bricks. The Kent and Essex brick trade is in a critical condition and any further additions to the heavy burden it has already to bear would probably result in its destruction, while already several of the larger makers are preparing to reduce their make. Trade is paralysed.⁷³

Not all brickmasters in Kent were against progress. Thomas Cubitt (uncle of Joseph), for example, was an early adopter of mechanization. The celebrated developer and builder of Belgravia and Pimlico went into the brickmaking business in order to guarantee his supply of good quality bricks. In the 1850s, late in life, he opened extensive grounds in the parish of Burham, where he set up ‘steam engines and a lofty furnace [kiln] shaft’.⁷⁴ The raw material in this part of Kent was different. This was the ‘Blue Gault’ district of central Kent (blue Gault Clay underlies the Chalk; London Clay lies above the Chalk). It was said to be more suitable for machines. Here, and around Aylesford in the Medway valley, machinery had for the most part supplanted hand moulding as early as 1865. Further inland, by 1880, the Kent Brick and Tile Company at Pluckley, near Ashford, used a kiln made by Hoffman of Berlin that held 400,000 bricks, and another kiln from Staffordshire for its ‘blue paviers’, as well as a Chamberlain moulding machine.⁷⁵

It is important to distinguish between the making of bricks by machine and the use of steam powered machinery in other phases of the process. We can be confident that some Faversham brickmasters used steam power because it had already been adopted by the local gunpowder and cement industries to drive their mills.⁷⁶ We know that Thomas Kingsnorth, for example, used steam to drive the ‘wheels’ of six of his fourteen stools in 1865. Steam power might also have driven Faversham brickmasters’ wash-mills – the place where clay, chalk, and water were mixed into a slurry that was then pumped to the pug-mill, where the water was drained off to leave the clay ready to be worked the next spring. As steam driven pumps became more powerful, they were able to force the liquid slurry through pipes for long

distances, thus enabling bricks to be made alongside a river or a tramway, located far from the raw material. This brought acreage into use that had hitherto seemed uneconomic to exploit.⁷⁷ For example, Smeed Dean obtained an enormous supply of fresh brickearth from a property near Tonge Church via a cast-iron pipe to their brickfields nearly two miles away. The pumps were designed to deliver sufficient brickearth to make 1,250,000 bricks per week.⁷⁸ Milton brickmaster William Wood installed a similar long-distance pipeline to a new field near Milton Church in 1899.⁷⁹

What we don't see among brickmakers in the Sittingbourne and Faversham districts is the use of steam to mould, shape, or cut bricks, or to transfer them from the maker to the clamp or kiln. On the other hand, Thomas Cubitt (d.1855) used steam in the process of *tile* making at Burham, higher up the River Medway. The Cubitt family were builders, engineers and contractors, and the comparison between them and the typical East Kent brickmaker is unfair. Nonetheless, it is difficult to escape the conclusion that whatever may have been the causes of the problems experienced by Kent's brickmakers after 1880, they were exacerbated by the industry's own failure to modernize. It is also the case that brickmakers around Bedford and Peterborough were quicker to do so.

THE BEGINNING OF THE END OF INDUSTRIAL-SCALE BRICKMAKING IN FAVERSHAM

We remember the name of Eastwood as a 'consolidator' in the brick industry. In 1889, workers at Eastwood's Shoeburyness brickfields in Essex went on strike for ten weeks, effectively closing the operation. They demanded twice the level of pay-rise given to the workers in Kent. The strike was settled by paying 30% more than the increase paid in Kent.⁸⁰ It is difficult to imagine the basis upon which the men from Essex claimed and obtained more money than their counterparts in Kent, but it demonstrates both a degree of organization and a flow of information between them.

After the extended period of weak demand in the 1880s, brickmasters needed to compete ever more keenly. Cost savings were imperative. Having failed to squeeze their workers, it was left to put pressure on the barge owners to reduce their rates. Was it coincidental that around the same time, bargemen sought an increase in their wages? Against the background of what became known as the Great Dock Strike in 1889, some people suspected political agitation.

The dispute came to a head in early 1890. It involved all three interest groups: employers, employees and bargemen. The employers and the bargemen organized themselves. The *Kent and Essex Brickmasters' Association* resolved that 'it would prove a great advantage to the industry if brickmasters supplying the London district would co-operate in dealing with the various labour questions as they arise'.⁸¹ Separately, the *Bargemen's and Watermen's Protection Society* refused to carry bricks.⁸² In consequence, the brickmasters had no option but to lock their workers out. Whole communities of brickies found themselves very quickly on the bread line.⁸³

Soup kitchens were set up in Sittingbourne and Milton, where 5,000 people were locked out.⁸⁴ The Faversham 'Soup, Bread, and Coal Society' took the measures implied by their name to relieve the distress. The list of donors included the brewer

W.E. Rigden and his wife, who both promised £5 each week for the duration of the bargemen's strike (perhaps not as generous as it seems, given their ownership of much of the Kingsfield site). Harry Child, a prominent shopkeeper and the town's mayor at the time, gave £3. Francis Giraud, the town clerk gave one guinea each week, and so on. Separately, the Faversham Board of Guardians resolved to pay the school fees of one hundred and twenty children during the continuance of the lock-out, the expense to fall upon the respective parishes to which applicants belonged.⁸⁵

Each employer was asked to furnish a list of those locked out; in those rural areas, where almost nothing but brick making was carried on, that meant practically the entire male population. In January 1891 the Kent and Essex Brickmasters' Association took an unusual step: they stated that having done their best to relieve the distress in their fields, they felt 'justified' in making an appeal to the public, requesting that donations be sent to Eastwood in Lambeth, or to Smeed Dean or to Wills & Packham & Co., both of Sittingbourne.⁸⁶

We should note, however, that barges engaged in the cement trade, the coal trade, the timber trade, the corn and meal trade and the gunpowder trade were not immediately affected. Of about two hundred and fifty Faversham bargemen who were members of the union, only thirty-two claimed strike pay.⁸⁷ But in early April the Faversham committee of the Bargemen's Protection Society called upon members not to accept freights of any kind whatever for delivery in any of the places where their brethren were locked out. This action was considered 'tyrannous', and the motion was not carried. Wiser heads saw that a call out of all Kentish bargemen in sympathy with the brick-carriers would worsen the social and economic condition of the whole community. An independent 'Board of Conciliation' was formed of the leading townsmen of Sittingbourne, Faversham, Milton, Rainham and Teynham. Faversham was represented by Harry Child and F. Johnson.⁸⁸

The *South East Gazette* considered the action of the bargemen 'suicidal' to the interests of the brickmaking districts; it saw the trade slowly but surely drifting away, probably never to be regained. A short-term consequence of the lockout was the policy decision by Kentish brickmasters to reduce output in the coming 1891-2 season by 20%. The long-term consequence was that marginal brickmasters went out of business.⁸⁹ There were knock-on effects on other parts of the economy, of course. For example, a Board of Trade enquiry into coastal shipping in 1896 was told of the decline in tonnage from Faversham.⁹⁰

The crisis among the brickmasters was not entirely the fault of wage pressure and bolshie bargemen. The industry in the South East was already feeling the pressure of stiff competition from the area around Peterborough. The eponymous *Fletton* brick was cheaper, in part because the shale oil found in the local brickearth reduced the cost of kiln drying, and in part because of the brickmasters' investment in new machinery. By April 1889 (i.e. before the strikes) the Great Northern Railway carried 150,000 *Flettons* daily from its sidings near Peterborough to London.⁹¹ It is not a coincidence that an immediate consequence of the strike and lockout was the loss by a Sittingbourne firm of an anticipated order for eighteen million bricks that went instead to Peterborough. By 1897, when the market had picked up, there were seventeen yards around Fletton that employed 1,000 men and turned out 5,000,000 bricks a week.⁹² The yards were mostly lit by electricity.

Nonetheless, the gloom in Kent and Essex was overdone. Shortage of supply and a pick-up in the London building trade helped those businesses that had survived. The 1897 season started in March (earlier than usual), and the principal makers increased wages by 10%, adding a net £40,000 to the wage bill over that in Kent and Essex in 1896. The local newspaper reported that the prospects were 'brighter than at any period since the memorable lockout'.⁹³ Smeed Dean's confidence on entering the new century was captured by a journalist's report in 1899:⁹⁴

Conceive, if the reader can, great fields of labour extending over 500 acres, active with the labours of 1,300 men and youths, and turning out 70 millions of bricks per year, besides vast quantities of other materials for builders' and contractors' use. Think, too, of a fleet of upwards of 80 barges, distributing goods by water over a wide area, almost 70 horses assisting the labours of the staff and, further, a colony of 300 well-built houses, used solely for the accommodation of the hands, and some idea will be gained of what the existence of the company means to Sittingbourne ... everywhere we come across powerful engines ranging from 80hp to 120hp.

But as Smeed Dean benefited from integration and investment, the rest of the industry declined. Comparative analysis of the census returns of 1901 and 1911 shows a reduction in numbers employed in the brick industry in England and Wales from 63,927 to 51,955 (down 18.7%). The decline was most marked in Kent (down 37.6%) and Essex (down 46.4%).⁹⁵ Some small part of the decline may have been the result of increased automation. But by 1914 the smaller fields around Faversham and Sittingbourne had closed. Kelly's Directory for Faversham (1934) listed no company engaged in the brick industry, though we know that the firm of Cremer and Whiting at Oare was in business. It ceased making stock bricks in 1966-67, but it continued to make reds.

The fact that industrial brickmaking in Faversham was relatively early to go, supports the thesis that its utility was always marginal i.e. it was particularly sensitive to changes in demand, rising costs of production and transport, and price competition. It failed to offset these structural disadvantages by innovation and mechanisation. It lacked the big nineteenth-century industrialist, the 'consolidator' and 'integrator', men like Smeed and Eastwood. But for about fifty years brick-making was Faversham's major industry. It changed the social mix in and around the town; it also changed the physical appearance of the town and the surrounding countryside forever.

WHAT PHYSICAL EVIDENCE OF THE INDUSTRY REMAINS AROUND SITTINGBOURNE AND FAVERSHAM?

The most obvious signs are the rows of terraced houses built for brickfield workers, as identified and located by Sydney Twist.⁹⁶ He produced a list of the brickfields around Sittingbourne and Faversham, together with a very clear description of their geographic location. It would be redundant to replicate that information here.

Less obvious to the casual observer, perhaps, are the strange levels in Faversham that resulted from extensive excavation. The best example is at the corner of Stone Street and South Road where the garden-level of houses in South Road is many feet below the level of the pavement in Stone Street. The area of excavation

extends almost the full length of Stone Street, on the north side, as far east as the Cottage Hospital, whose front entrance at street level is reached by a *bridge*. Light distancing and ranging (LIDAR) technology, uses laser beams from low-flying aircraft to show the extent of excavation, some of it surprisingly close to the centre of the town. The technology allows users to ‘see’ through buildings and vegetation, by making them invisible. In theory, LIDAR enables us to identify all the sites around the town excavated for brickearth or chalk or gravel, but in practice it is not so easy. The Stone Street excavation, however, stands out unmistakably.⁹⁷

Some architects and engineers *specified* the source of bricks and other material to be used in the projects under their control. For example, the stock bricks specified for the *interior* of Westminster Cathedral in the 1890s came from ‘Faversham’, although not from a named maker.⁹⁸ Elsewhere, Smeed is credited with the supply of bricks to construct ‘the shell of Westminster Cathedral’.⁹⁹ Both statements could be true. Smeed’s supply of bricks to major London building projects are listed by Perks. They include much of docklands, Tower Bridge and the Law Courts in the Strand.¹⁰⁰ One local historian has asserted, however, that the 878 arches of the railway from London Bridge to Greenwich were built entirely with bricks from Faversham in the period 1834-38.¹⁰¹ But the London & Greenwich Railway Company’s own records show that no Faversham brickmaster responded to the original invitation to tender.¹⁰² The 3¾ miles stretch of viaduct consumed sixty million bricks.¹⁰³ It is very difficult to see how Faversham brickyards could have met such huge demand at that early date. Railway historians prefer Sittingbourne as the main source, though the boundaries between them were confusing to most people.¹⁰⁴ It is possible that brickmasters in Sittingbourne and Faversham co-operated rather than competed in cases of large-scale London projects.

Brickies, the press and the local community

Newspapers showed little interest in the impact of brickmaking on the local community, except in times of acute hardship brought about, for example, by the severe winter of 1867 and the bargemen’s strike in 1890. In January 1867, after weeks of bad weather, the Mayor convened a meeting (not well attended, except by churchmen) at which he stated that Faversham now contained a greater number of labouring people than it had ever done before, and that the labour was of a class especially prone to the effects of bad weather. Speakers spoke of more distress than they had ever seen before. The town’s charity commissioners organized a soup kitchen and distributed small amounts of money to families until the charity had exhausted its means. The meeting resolved to establish a special relief fund.¹⁰⁵

Newspapers were also interested in community matters relating to religion and temperance, but their stories did not show how brickies were integrated into the town’s existing structures; they showed, instead, how independent they were, from top to bottom. The bosses’ initiatives in the social affairs of their workers were born of self-interest. Faversham brickmaster Mr Pryer adopted the temperance movement and was behind the building of a coffee tavern on the Brents for brickmakers, bargemen, and others of the working classes.¹⁰⁶ In 1880, up to four hundred Faversham brickmakers convened in the Lecture Hall in East Street in order to ‘express a true friendliness and esteem for each other’, and also to engage

their sympathies on the side of temperance and religion.¹⁰⁷ In 1881, a church was built for the new parish of the Brents. It became known as the brickies' church because it served the families of local brickworkers.¹⁰⁸ However, it was not funded by brickmasters, but by the widow of William Hall, the local gunpowder magnate. In the twentieth century, Sydney Twist knew brickies to be 'men of strong character, quiet industrious workers, a lot of them church or chapel-goers'.¹⁰⁹

In Sittingbourne, George Smeed looked to religion to improve the sobriety and punctuality of his workers and considered the building of churches a good investment. He built All Saints, Murston (for his brick workers) and All Saints, Galley Hill (for his cement workers).

The Faversham Institute was the official organ of Faversham's establishment and its aspirants. It published a monthly *Journal* from 1855 into the twentieth century; it never once reflected upon the changes to the town brought about by the brick industry. Although the Institute saw itself as being in the business of education, neither the *Journal's* editors nor its contributors concerned themselves in print with the social and educational needs of the adults and children of the brickyards.

BIBLIOGRAPHIC NOTE

The following reports on social conditions can be consulted:

House of Commons [HCPP], *Children's Employment Commission*, Fifth Report, p. 133. Third report into child labour in Kent's brickfields, conducted by Mr H.W. Lord in 1865. HCPP, 1866 *Children's Employment Commission* Report: Brickfields.

ENDNOTES

¹ G. Daws and P. Hobbs, 'The variety of brick types and sizes used at Old St Albans Court, Nonington', 281-93.

² House of Commons Parliamentary Papers online (HCPP), Brick tax returns, 1830-31 [348].

³ HCPP, *op. cit.* Brick 1846 [397].

⁴ HCPP, *op. cit.* Brick Duty, March 1838.

⁵ There was an unexplained spike in the production of the Canterbury district in 1841 and 1842, when it managed to reach half the level of production in the Rochester collection district.

⁶ HCPP, *op. cit.* Brick 1839 [329]; Brick 1846 [82]; Brick 1850 [112].

⁷ Kent History & Library Centre (KHLC), U1948, T6.

⁸ *The Kentish Weekly Gazette / Canterbury Journal*, 1 March 1825.

⁹ *Ibid.*

¹⁰ Canterbury Cathedral Archives [hereafter CCA], DCc-BB/50/138, 1825.

¹¹ CCA, DCc-BB/50/149 and 150 for coloured plans.

¹² J.L. Crouch, 'The Management and Valuation of Brickfields', *The Surveyors' Institution Journal*, 1899, p. 242.

¹³ CCA, DCc-BB/50/144, 1827.

¹⁴ *London Gazette*, February 1828.

¹⁵ E. Crow, *Historical Gleanings relative to the town of Faversham, c. 1855*, transcribed by Peter Tann, History Research DVD, 2009, p. 363. Crow tells us that 'the houses forming Brent town commenced in 1829'.

¹⁶ CCA, Preston Poor Rate book, U3/249/11/14-27.

¹⁷ HCPP, 1842 [007], Sanitary Condition of the Labouring Population of England, p. 36.

- ¹⁸ His name survives in ‘Waller’s Row’ in Ospringe.
- ¹⁹ *Reports from Commissioners on Municipal Corporations in England and Wales, Kent, Faversham*, 1834, pp. 961-978 (MCA Report Faversham).
- ²⁰ *Ibid.*, p. 972.
- ²¹ HCPP, 1852-53 [1631], vol. 1.
- ²² The Registration district of Faversham comprised three sub-districts of Boughton, Faversham and Teynham. The Registration district of Milton was not sub-divided. The sub-district of Faversham included the brick-making parishes of Ospringe, Preston, Davington and Oare. The Milton district included the brick-making parishes of Sittingbourne, Tong, Murston and Milton.
- ²³ HCPP, 1872 [C.676.2] Census of England and Wales, 1871.
- ²⁴ HCPP, 1871 [C.381 table X].
- ²⁵ HCPP, 1913 [C.7018, 7019].
- ²⁶ S. Twist, *Stock Bricks of Swale*, Sittingbourne Papers No. 2, 1984 gives accurate descriptions of the location of brick workers’ cottages, many of which exist today.
- ²⁷ HCPP, H.W. Lord’s report on children, 1866.
- ²⁸ The *William*, of Faversham, a sailing barge, was in a collision on the Thames at Southwark and sank with her cargo of 30,000 bricks (*Morning Post*, 12 March 1846).
- ²⁹ In terms of shipping records, Milton came under the port of Faversham.
- ³⁰ R.H. Perks, *George Bargebrick Esquire*, Meresborough Books, 1981, ch. 5 ‘On the Tideway’ gives a very detailed record of ships and shipping involved in the Kent brick trade.
- ³¹ *East Kent Gazette*, 20 January 1923.
- ³² D.L. Sattin, *Just off the Swale...the story of Conyer*, Meresborough Books, 1978.
- ³³ Oare creek served the large Faversham brickfield known as Ham Farm, for example.
- ³⁴ E.J. Marsh, *Spritsail barges of Thames and Medway*, 1948, p. 72 (self-published).
- ³⁵ HCPP [C.2338] Thames Traffic Committee, 1879. Evidence of E.T. Coulter and others, questions 9318-9706. A sailing barge from above Rochester would make a round trip to London in a week, but only if they came back empty.
- ³⁶ *The Builder*, January 1880, p. 90, reported that the Brick & Tile company in Pluckley sent its blue paviers to all parts of the country from Pluckley Station.
- ³⁷ *The Builder*, 11 October 1884, in a review of Davis, *Bricks, Tiles and Terra Cotta*, London and Philadelphia, 1884. See also review of 3rd edition, 1895, *The Builder*, 26 October 1895, p. 1895.
- ³⁸ *The Builder*, 2 April 1887, pp. 518-519.
- ³⁹ This category includes tiles, drain-pipes, ridges, chimney pots, and ornamental products, not forgetting flower pots, and saucers.
- ⁴⁰ HCPP [C.745] *Report of the Inspector of Factories*, 1873, p. 14. ‘Near the bank of the Thames, as far down as the mouth of the Medway, and again, up that river to Maidstone are a nearly continuous series of larger i.e. “factory” fields’, Mr Whymper, sub-Inspector.
- ⁴¹ *Whitstable, Tankerton, Herne Bay Herald* [hereafter *WTHBH*], 10 November 1877. Compare these values with the estimate for 1878 cited by *The Builder*, fn. 34 and the local output stated at an enquiry in c.1883, fn. 36.
- ⁴² A. Cox, ‘Bricks to Build a Capital’, in Hobhouse & Saunders, *Good and Proper Materials*, Royal Commission on Historical Monuments, 1989, p. 9.
- ⁴³ Ash was a good dressing for agricultural land but was ‘not so much used on account of [its] consumption in the manufacture of bricks’ (Boys, *A General View of the Agriculture of the County of Kent*, 1796, p. 27).
- ⁴⁴ The noxious fumes were of carbonic gas. In 1856, an inquest found that an intoxicated man suffocated as a result of lying down on top of a brick-drying clamp in Kingsnorth’s field, *Kentish Gazette*, 16 September 1856.
- ⁴⁵ The long slow burn of the clamp had its parallel in the ancient method of making of charcoal.
- ⁴⁶ HCPP, *Eighteenth Report of the Commissioners of Inquiry into the Excise*, 1836, appendix no. 8, 1833.
- ⁴⁷ HCPP, 1866 *Children’s Employment Commission Report Brickfields*.

- 48 HCPP, 1863 [411], *Metropolitan Board of Works Report*.
- 49 CCA, U3-146/11/345/1.
- 50 *The Builder*, 23 March 1878, p. 305.
- 51 *The Builder*, 13 September 1879.
- 52 *The Builder*, 11 August 1888, p. 109.
- 53 R.H. Perks, *op.cit.*, p. 40. The date of the enquiry is not given.
- 54 J.L. Crouch, *op.cit.* The valuation of brickfields was an important area of the surveyors' profession.
- 55 *The Builder*, 25 September 1854, p. 502.
- 56 F.G. Willmott, *op cit.*, pp. 1-2.
- 57 *Kentish Gazette*, 11 Nov 1856.
- 58 *Kentish Gazette*, 14 Jan 1860.
- 59 Faversham parish rate valuation list, 1869, CCA-U3-146/11/345/1.
- 60 *WTHBH*, 31 Jan 1880.
- 61 CCA, U3-146/11/351, entry no. 2147.
- 62 The East Kent Railway Company (TNA RAIL 415/1). At the east end of Sydenham tunnel the brickfield extended to sixteen acres.
- 63 The extensive advertising section of *The Builder* very rarely carried an advertisement from a Faversham brickmaker, suggesting that speculators did not aim their products directly to the building trade.
- 64 *The Builder*, 30 September 1876, p. 961.
- 65 *WTHBH*, 22 March 1879.
- 66 *The Builder*, 17 August 1878, p. 865, gives a summary of the machinery introduced into the brickmaking industry.
- 67 *The Builder*, 14 November 1891, p. 372.
- 68 This finding is reinforced by Kathleen Watt's PH.D. thesis, 'Nineteenth century brickmaking innovations...', York University, 1990. Machinery was used in tile manufacture in west Kent, but this thesis makes no mention of the area around Faversham or Sittingbourne.
- 69 *The Builder*, 20 July 1861. In the Manchester area, the supply of bricks was refused to anyone who countenanced the use of machine-made bricks.
- 70 *The Builder*, 4 April 1896, p. 305.
- 71 *The Pictorial Record*, April 1899, p. 13.
- 72 F.G. Willmott, *Bricks and Brickies*, Rainham, Kent, 1972, p. 23, (privately published).
- 73 *The Builder*, March 1890, p. 218.
- 74 For the story of Cubitt and Burham brickworks, see 'hereshistorykent.org.uk'. In 1859, after his death, the business was sold to Webster & Co., see 'cementkilns.co.uk'.
- 75 *The Builder*, reference to blue paviers, 17 July 1880, pp. 90-91; Chamberlain's machine 'did good work', but 'were complicated and needed much repair'. Watt, *op. cit.* p. 217.6 September 1861 complicated and needing machines, sixty rods of portable tramway, two turntable, three pug mills and an iron pump
- 76 KHLIC, U229 B4, Shepherd & Weston cement manufacturing partnership, 1824.
- 77 *The Builder*, 24 April 1886, p. 604. Report on Paper on brickmaking given to the Institute of Civil Engineers by Henry Ward.
- 78 *The Builder*, 2 April 1867, pp. 518-519.
- 79 *The Pictorial Record*, April 1899, pp.13-15.
- 80 *The Builder*, 21 December 1889, vol. 57, p. 451.
- 81 *The Builder*, March 1890, vol. 58, p. 65.
- 82 The full name of the Bargemen's Union was the Rochester, Sittingbourne, Maidstone and Faversham Bargemen and Watermen's Protection Society.
- 83 HCPP, *Report on the Strikes and Lock-outs of 1890*, Board of Trade [C6476] 1890-91. The 'official' story.
- 84 *The Builder*, March 1890, vol. 58, p. 199.

⁸⁵ *WTHBH*, 5 April 1890. In the Brents, a meal of roast beef, vegetables and rice pudding was provided free for 280 children under fourteen.

⁸⁶ *The Builder*, 24 January 1891, vol. 60, p. 63.

⁸⁷ *WTHBH*, 29 March 1890.

⁸⁸ *The Builder*, 29 March 1890, vol. 58, p. 237.

⁸⁹ *WTHBH*, 5 April 1890.

⁹⁰ HCPP, 1896 Board of Trade Report [C8167], q. 3710.

⁹¹ *The Builder*, 27 April 1889.

⁹² *The Builder*, 23 October 1897 and 20 November 1897.

⁹³ *The Builder*, 3 April 1897, vol. 72, p. 326.

⁹⁴ *The Pictorial Record*, April 1899, p. 9.

⁹⁵ HCPP 1913 [7018].

⁹⁶ Twist, *op. cit.*

⁹⁷ See: www.swaag.org/LIDAR/LIDAR%20Image%20Processing%20for%20Amateur%20Archaeology%20Groups.pdf.

⁹⁸ Winefride L'Hôpital, *Westminster Cathedral*, London, 1919, vol. 1, p. 70. 'The building was lined ... with Faversham *stocks*, left rough and unpointed in order to afford a satisfactory surface for the adherence of the shell of marble and mosaic when the time came for its application'.

⁹⁹ R.H. Perks, *op. cit.*, p. 9.

¹⁰⁰ *Ibid.*

¹⁰¹ A Percival, *Faversham Bricks*, www.faversham.org.

¹⁰² London and Greenwich Railway Company, TNA, RAIL 389.

¹⁰³ C Wolmar, *Fire and Steam*, 2007, p. 58.

¹⁰⁴ A.R. Bennett, 'The First Railway in London', in *The Locomotive Magazine*, 1912, 'The bricks were good sound *stocks*, mostly from Sittingbourne ...'; TNA ZLIB 4/226; Turner, John Howard, 1977, *The London Brighton and South Coast Railway: 1 Origins and Formation*, p. 41.

¹⁰⁵ *WTHBH*, 26 January 1867.

¹⁰⁶ *WTHBH*, 10 May 1879.

¹⁰⁷ *WTHBH*, 21 Feb 1880.

¹⁰⁸ The church of St John the Evangelist in the parish of The Brents & Davington was declared redundant in 2000, and the building sold.

¹⁰⁹ Twist, *op. cit.*