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# Rivals of Boulton and Watt:

## Steam engines and engineers in London

John Kanefsky

I recently published a detailed analysis of steam engine building in London's industries in the period 1780-1805<sup>1</sup>, choosing the dates to facilitate comparison with a survey by John Farey of engines (both the well-known products of Boulton and Watt and the other less venerated engineers) working in the capital at that date.<sup>2</sup>

This paper draws on and expands the latter part of that research, and also reports on subsequent investigation, most notably newspaper records. It focuses not on the output of the Soho firm, since their production was analysed in detail in the earlier offering and has been written up exhaustively elsewhere, but the other engines, engineers and engine erectors who operated in London during that period. It hardly needs to be said that the records of these other players are mostly scarce to the point of invisibility compared to the overwhelming volume of the B&W archives. But the information available is sufficient for us to update and analyse the numbers, and give more weight to these other individuals and enterprises.

### Background

Historians of the steam engine and of the Industrial Revolution more generally have in the past overwhelmingly focused on Boulton and Watt, partly because of their real achievements, partly in the form of adulation bordering on hagiography, and partly because of the sheer volume, availability and coverage of their archives and the elegance of their drawings.<sup>3</sup>

An early study of steam engine building in London, by David Perrett in 1979<sup>4</sup>, made only passing mention of engines other than those of B&W in industrial enterprises, though noting their use in waterworks and commenting in relation to Farey:

“although Farey's total includes a few surviving Newcomen engines, the sources and locations of the 66 engine not by Boulton and Watt require further research”<sup>5</sup>.

By extending the research for the Early Engines Database to 1805 for London, I was able to do a detailed comparison of the Farey survey and other evidence, and to show that while Farey included around a dozen engines which could not be matched to the database, the latter recorded over 30 not seen by him. In that paper I noted:

“By the later 1780s ... other engine makers like Bateman and Sherratt were able to offer a complete mill engine with installation and everything except engine housing in brick/stonework and the millwrights work (drive trains, gearing etc.). The important work of the millwrights who connected the engines to the production machinery is however beyond the scope of this article”.<sup>6</sup>

This paper is designed to address, at least as far as currently available sources allow, part of that gap, by examining the designers of these engines; the foundries which produced the components; and the engineers who built them and set them to work, though not the millwrights, about whom even less is known.

### Engine types and designers

A number of different engine designers and patentees operated in London in the 25 years after 1780, though none of them on a scale individually to rival the engines designed by B&W (and built by them after 1796 when the Soho Foundry opened).

As is well known, erecting a steam engine was until the last quarter of the eighteenth century generally an exercise more akin to building a one-off house with no access to architects, builders' merchants or ready-made components than to putting up a standardised product from detailed plans and an inventory of plant and materials.

However, this was changing rapidly, especially after about 1790, as better casting and metal-bashing techniques were being adopted, precision in tool making and working machinery was developing rapidly, and iron was re-

placing wood in many millwrighting and engineering disciplines. And London was in the vanguard of this transition, through the improvements led by Bramah, Maudsley and other less celebrated individuals and enterprises.

Who were the main engine designers?

**Fenton Murray & Wood** (figure 1), based in Leeds and led by Matthew Murray, were probably the most important and innovative steam engine builders after Boulton and Watt. Their advantage was superior casting quality and ability to deliver well-made highly specified but conventional engines; indeed their castings were so much better that Soho sent spies to copy their greensand casting techniques and bought land next to their factory to stop them expanding. This was only

partially successful, and after a spurt in orders for B&W engines immediately after the patent expired FMW and others took increasing shares of the market, especially in the Midlands and Scotland. Their cast iron beams and framing, making small engines semi-portable, were particularly admired. However, they left no business records and we know of only a few FMW engines built in London before 1805, although there were doubtless others. One we do know about is that bought by Swann of Goodman's Fields, about which the B&W archives note resignedly – a summary of one letter reads:

“James Watt Jr. (London) to Gregory Watt (Soho). 7 Dec. 1802. 2 or 3 months ago they sent an estimate for a 40 horse engine to Mr. Swann of Goodman's Field, London. Has heard Swann has ordered an engine from Matthew Murray, Fenton & Wood, as their estimate was £400 less. Can he have a copy of the estimate”<sup>7</sup>

Other engine makers were also active. The divided cylinder engine designed by **Robert Cameron** and developed by him and his partner Jeffreys, was popular as a winding engine in north-eastern collieries and at least four were installed in London. The design split the cylinder in two parts with two pistons which slid together through the middle, connected by the piston rod. The lower part of the cylinder contained the steam, the upper part acted as an air pump creating the vacuum. The engine therefore operated with a short stroke and more strokes per minute than other designs, which caused issues when used to wind coal but could be an advantage for some industrial applications in relation to gearing and smoothness of operation. Although Boulton and Watt (for whom Cameron had at one time done work) argued that the design infringed their patents, they did not challenge them in court. At least four were built in London in the 1780s, though it is not known how long or successfully they worked, and the design was presumably not pursued further.

**William Symington** was a Scottish inventor, most famous for steamboats, but who patented a steam engine after working on a B&W one at Wanlockhead. His engine took a different approach from Cameron; it was designed to achieve comparable efficiency to the Watt engine but with greater simplicity by avoiding a separate condenser and air pump. It consisted of a longer cylinder and a second piston in the bottom including a non-return valve, which operated as a pump to remove the condensed steam. Significant numbers of these were built in Scotland and worked efficiently for many years; however, although they were more efficient than the Newcomen engine they were not sufficiently simple (or presumably reliable and economical) to become widespread. At least four were nonetheless erected in London and operated successfully at a brewery, a colour mill, a paper mill and a woollen mill, although again after the Watt patents expired and others could build engines with separate condensers they had few advantages and faded out, even in their Scottish stronghold.

**Joseph Bramah** was a prolific inventor, better known for locks, WCs, machine tools and his immense contribution to precision engineering and quality control, but he also invented an improved steam engine and at least three were built in the London area in our period. His engines may have been built by his own works, or Winder's foundry on Narrow Wall in Lambeth, where he was a partner until 1798.

**Jabez Carter Hornblower** and Stephen Maberley (figure 2) developed a twin cylinder beamless engine from a

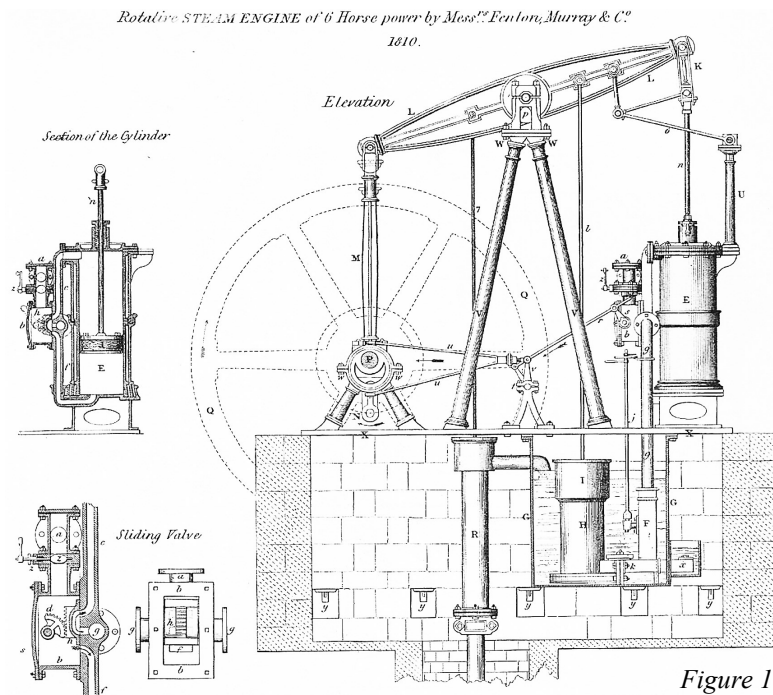
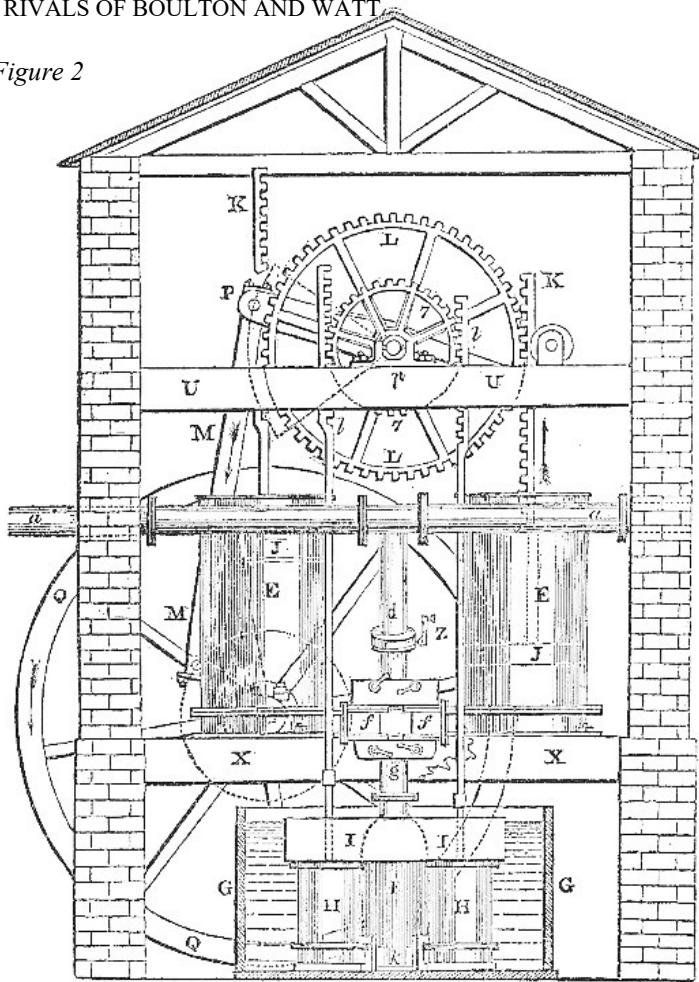


Figure 1

Figure 2



design patented by Isaac Mainwaring, and built at least two of these in London (one at Allen's foundry which seems likely to have cast / machined the parts), but as they pirated the separate condenser they were pursued by the Soho firm and eventually had to pay premiums. Once again, their designs were not sufficiently attractive to survive the expiry of Watt's patents.

**James Sadler** (the pioneering balloonist) also contributed. His engines were compact beamless ones using the minimum of materials built around a frame with the motion to the crank reversed via guides, particularly suited to constricted sites where size and cheapness were desired. At least one and probably others were erected in London, and they were popular in Shropshire and elsewhere, especially in the first decade or so of the nineteenth century.

The background to the high pressure engines (figure 3) invented by **Richard Trevithick** is well known and needs no further detailed exposition here. The unsung role of his London engineer David Watson was discussed in my earlier paper and will be further examined below. Trevithick only came on the scene in

the years immediately after 1800 and the adoption of high pressure engines, later so important for railway locomotives, was set back by the well-documented boiler explosion in Greenwich. But several, perhaps up to a dozen, Trevithick engines were in use in London by the time of Farey's survey.<sup>8</sup>

Simple but well-constructed **atmospheric engines** were also built in London and elsewhere by a wide variety of unsung erectors but were the "unknown unknowns" of engine building in London – so-called "common engines" with a crank, perfectly useable for businesses which needed moderate amounts of power and were not dependent on Smeaton's "perfectly steady" operation<sup>9</sup>. These could be built for a few hundred pounds, and set to work by any one of a number of competent engineers/millwrights. Furthermore, at least one improved version of the Savery steam pump was also put up in London, the engine which pumped water over a water wheel at Kier's axle-tree factory, in 1794 and drawn by Farey (figure 4)<sup>10</sup>. There may have been others, particularly along the river valleys bordering the capital, but none have drawn the attention of historians.

In all, over 40 steam engines erected by 1805, but for which we have no details of their type, designer or erector, can be documented from newspaper advertisements and other sources. There were very likely others which have left no trace: as my earlier paper shows, Farey surveyed many we cannot identify, and he probably missed others. Some of these were almost certainly the products of the designers described above, rather than "common engines" of no special interest, but this will never be known.

### Foundries and engineers

Designing an engine and persuading a business that it was the right tool for their job was only the first part of the process, of course. This was not a problem, however. Despite the myth that London was not a major industrial hub, the Capital was actually well provided with foundries and engineering workshops that could provide many if not all the castings (except perhaps larger cylinders) and forgings, wrought iron and brass components of steam engines. There were also many carpentry workshops which could provide wooden framing, beams, gears, etc, although by 1800 cast and wrought iron was already replacing much woodwork, including engine beams.

The London directories and newspaper advertisements supply the detail of most if not all of these enterprises. There were several such directories in the relevant years, all with slightly differing lists of businesses and individuals. Definitions were unsurprisingly not consistent, and many entries described themselves slightly different-

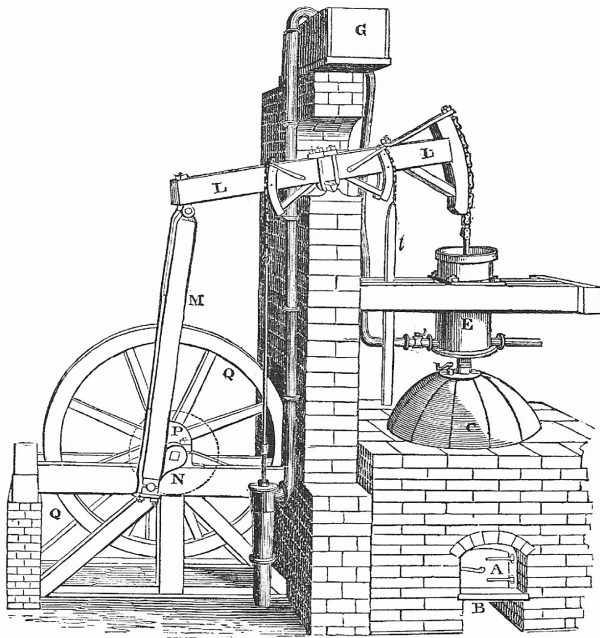
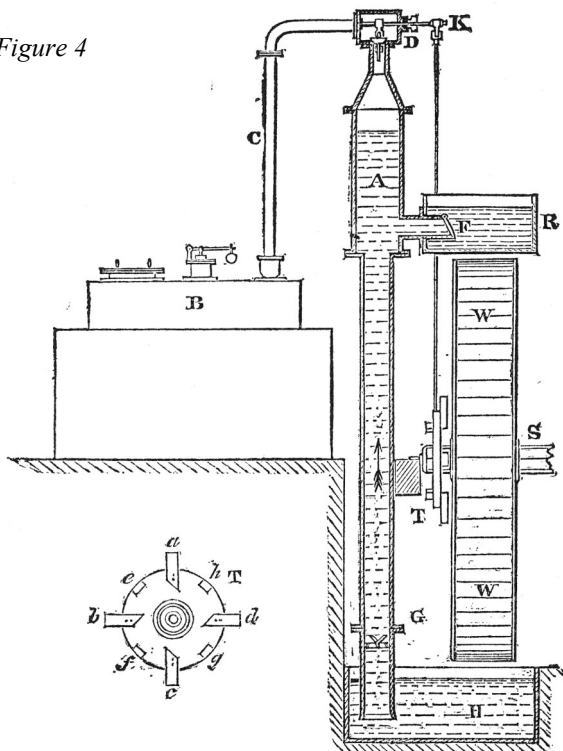


Figure 3

ally flag up individuals unknown to the directories. For example, an inventor called Edward Chapman (not in Kent's Directory, perhaps of the noted Whitby family) advertised his engines in 1802, stating that "Improved Steam Engines" by the King's Patent, are manufactured, by appointment of the Patentee, by E. Chapman, No 57, New Compton Street, Soho; where may be seen several small ones, applicable to a variety of domestic purposes. – N/B. A small Engine at work on Mondays, Wednesdays and Fridays, from the hours of two until four o'clock".<sup>12</sup>

Care needs to be taken in interpreting Table 1, of course. "Engine" did not necessarily mean "steam engine"; it was at this time a general epithet which could encompass a wide variety of devices and mechanisms which operated in a multitude of industries and trades including water wheels and horse mills. But it is probably true that most of the individuals and firms which described themselves using the term "engine-maker" or "engineer" could around 1800 turn their hand to making and putting together much if not all the metal parts of a steam engine, so the point being made here – that there were a plethora of firms in the city, engaged in engineering, widely defined - stands. Many, especially the foundries, were based on the south bank of the Thames, but others were scattered around the Capital. For example, Bramah's address was 14 Piccadilly and he also had a workshop in

Figure 4



ly in different publications, but they all broadly tell the same story. Kent's Directory of 1803<sup>11</sup> is the most useful for our purposes. Table 1(a) lists the entries in that publication for engineers, millwrights etc who did or may have contributed to engine building in London. Table 1(b) similarly lists the iron foundries and related businesses who probably supplied much of the iron-work. There were moreover numerous brass foundries, lead works, coopers, carpenters and other specialist trades which also supplied parts, but I have not attempted to list these or delve further into the interrelated manufacturing firms and trades in London in this period.

Engine builders were also unsurprisingly involved in the machinery the prime movers drove, such as flour, sugar, oil mills, often working with specialist millwrights who connected the engines to the machinery. Newspaper advertisements and press reports also add some colour to the dry lists in directories, and occasion-

Pimlico; William Rowley, who did work for Trevithick and the Hazeldine Foundry in Bridgenorth, was in the developing fashionable area now called Fitzrovia; and Archibald Stevenson had premises in Cavendish Square.

The detailed development of the engineering and millwrighting industry in London either side of 1800 would be an interesting research area for someone to take up.

### Secondhand engines

We should also note that (as again mentioned in relation to B&W in the earlier paper) there was an active market for secondhand engines, which the Early Engines Database and Table 2 recognises wherever information is available – such engines are not duplicated as main entries, but any relevant information as to where they were moved is added in the comments column of the spreadsheet. A good example of an advertisement from 1801 states: "To be sold, a complete Steam Engine, made by Boulton and Watt, equal to eight horses power – Apply to Richard Baker, engine-maker, No 65, Fore-street, Moorfields"<sup>13</sup> Interestingly, Kent's Director of 1803 describes him not as an Engine-maker but as a "Mangle

**Table 1 - Kent's Directory, 1803****(a) Engineers, Engine Makers & Millwrights etc**

Bristow Mary & Son, Engine-makers, 47, Ratcliff Highway  
 Chieslie R. & Co., Engine-makers, 72, Margaret St Cavendish Sq.  
 Collins, Boughton & Noble, Engine, Chain & Hand Pump-makers, Bridge Road, Lambeth  
 Dodgson Geo., Patent Pump & Engine maker, 51, Lower Shadwell  
 Edwards John, Millwright & Pump-maker, Wine St. Lambeth  
 Hadley & Simpkie, Engine-makers, 63, Long-Acre  
 Harland C., Engine & Press-maker, 163, Fenchurch Street  
 Lemon J., Millwright & Engineer, 25, Fieldgate-St., Whitechapel  
 Mattinson Tho., Millwright, 130, Shoreditch  
 Moore Tho., Pump & Engine-maker, 17, Winchester St. Southwark:  
 Norton J. & P., Millwrights & Crane-makers, 220, Tooley Street  
 Paton T. & Co. Engine makers & Millsmiths, Church St. Blackfriars Rd.  
 Phillips & Hopwood, Engine Makers, 8, Gt. Surry St. Blackfriars Rd  
 Philpot Benj., Press & Engine-maker, Up. Ground, Christ-Ch St  
 Rennie John, Engineer, 27, Stamford Street, Blackfriars Road  
 Rowley Wm., Engine-maker, 7, Cleveland-Street, Fitzroy-Square  
 Rowntree & Seaman, Engine-makers, 35, Gt. Surry St. Blackfriars Rd  
 Stevens John, Engine-maker, 6, Well Street, Wellclose Square  
 Stevenson Arch, Engine-maker, 74; Margaret St, Cavendish Sq.  
 Watson David, Steam Engine maker & Millwright, Blackfriars Road.  
 Woolgar Wm., Engine-maker, 109, Minories

**(b) Iron Foundries etc.**

Betterton Joseph, Founder, 21, Aldersgate Street  
 Birkbeck & Ball, Iron Foundry, Stoney Street, Southwark  
 Botten & Son, Founders, 62. Shoe Lane, Fleet Street  
 Bradley Jas & Co. Brass & Iron Founders, 32, Bear-garden, Bankside  
 Brodie Alex., Iron Founder, Cary Street, Lincoln's-inn-fields  
 Dunbar Wm., Iron Foundry, 192, Tottenham Court Road  
 Gardner & Co., Iron Founders, Rotherhithe Street  
 Handasyde Gilbert, Iron Foundry, Falcon-Stairs, Southwark  
 Howard & Co., Iron Foundry, King & Queen Stairs, Rotherhithe  
 Jackson Hen., Iron Founder, Crawford's Passage, Ray St. Clerkenwell  
 Kinman, Fran., Founder, New Street Square, Shoe Lane  
 Lukin Jas. & Co., Iron Foundry, Up. Ground, Christ Church, Surry  
 Mill & Loat, Ironmongers, Founders & Braziers, 116, Long-acre  
 Noble Mark, Iron Founder, Narrow-wall, Lambeth  
 Stevenson Sampson, Iron Founder, 13, King Street, Seven Dials  
 Taylor Tho., Iron founder & Hardwareman, 2, Crown St. Moorsie [?]  
 Winder Tho., Brass & Iron-founder, Bridge Road, Lambeth

*Source: Kent's Directory for 1803. Being an Alphabetical List of the Names and Place of Abode of the Merchants & Traders of London and Parts Adjacent (Couston, 1803)*

and Press-maker" so he is not included in Table 1(a).

Another advertisement from 1803 runs as follows: "TO ENGINEERS and OTHERS. – A SECOND-HAND STEAM-ENGINE to be Sold, about three horse power. – For particulars inquire of James Burton, Millwright and Engineers, Pond-yard, Bank-side, Southwark"

Similarly, Burton is not listed in Kent's Directory of 1803, though a James Burton, perhaps the same man or a relative, is recorded as a "Cooper and Turner, 12, City-road, Moorfields" in Wakefield's 1794 Directory.

**Numbers**

The earlier paper in IJHET put the number of engines by makers other than B&W tentatively at 70.<sup>14</sup> After further work on newspapers online, and after deleting some dubious and duplicated entries, the latest figure is now 73, as in Table 3, though even this will be subject to amendment if further sources become available in the future.

Most of the additional entries are from the period after the expiry of Watt's patents in 1800. This is unsurprising; as well as the increasing use of cast iron components and cheap, well-made small engines being widely available, the new freedom to apply the separate condenser and the best of Watt's other inventions (though B&W themselves completed moving from using the sun and planet gearing in favour of the crank in 1802), the first decade of the nineteenth century was also a period of rapid economic development, accelerating technological change, political and military turmoil, and other factors favouring expansion in the use of steam power.

**Industries**

Steam engines were installed at a very wide range of factories, mills and other enterprises in and around London by 1805. Table 4 of the earlier paper gives numbers for all makers including B&W, though as Watt's engines were concentrated in breweries and other highly profitable industries the makeup of engines built by their competitors is slightly different. For other engines, Table 2 (previous page) summarises the spread.

**David Watson**

My earlier paper highlighted the work of David Watson as the principal erector (and presumably maker of the parts) of Trevithick's London engines from about 1803. But he was an important figure before then. His works clearly built a number for export to the West Indies to work sugar mills (which he also construct-

**Table 2****Non-B&W engines in London – Industries**

Metal working	16
Flour & Bread	12
Breweries	7
Textiles	7
Oil & seeds	6
Paper 3	
Misc. other trades	22
<b>Total</b>	<b>73</b>

*Source: Early Engines Database, Industrial London 1780-1805*

*This listing is not available online but the full spreadsheet including sources is available from the author  
email [j.w.kanefsky@exeter.ac.uk](mailto:j.w.kanefsky@exeter.ac.uk)*

**Table 3: Non-B&W engines in London 1780-1805**

Date	Location	Owner	District/parish
1781	Deptford Naval Victualling Yard		Deptford
*1785	Law's Snuff Works, Lock Yard	Law	Borough
1785	Blair's Workshop	Blair	Lambeth
1785	Dean & Co Snuff Works	Dean	
*1786	Langmead's Foundry, Goswell St.	Langmead	Finsbury
1786	Battersea Oil Mill	Barrow	Battersea
1786	(a flour mill)		Chelsea
1786	Whitefriars Wharf		Temple
*1787	Mill Street, <u>Dockhead</u> (St Saviours' Dock)		Bermondsey
*1787	Wandsworth Mill		Wandsworth
1787	Webster's Leadworks, Lisson Green	Webster	Paddington
*1790	Kinman Bros, Pedlar's Acre (County Hall)	Kinman	Lambeth
*1790	Kinman Bros, Pedlar's Acre (County Hall)	Kinman	Lambeth
*1792	Cuckold's Point Bakery		Rotherhithe
1792	Barley Mow Brewery	Hare, later Taylor Walker	Limehouse
1792	Walker's <u>Colourworks</u> , <u>Coldbath</u> Fields	Walker	Clerkenwell
*1793	Rowntree, Engine-makers, Gt Surrey St., Blackfriars Rd.	Rowntree	Southwark
1793	Cuper's Bridge Woollen Yarn Co	Boulton & Morgan	Lambeth
1793	<u>Dockhead</u> Mill, St Saviours Dock	Campbell	Bermondsey
1793	Ranelagh Mill ( <u>2who</u> )		Battersea
*1794	Falcon Iron Works, Falcon Stairs, Bankside	<u>Handasyde</u>	Southwark
1794	Kier's Axle-Tree Factory, St. Pancras	Keir	Camden
*1795	Bowman & Garforth, Duncan Street, London	Bowman & Garforth	Whitechapel
*1795	George St, Brick Lane (name indistinct)		Spitalfields
*1795	Nock, Gunmaker, Castle Alley Newcastle Street	Nock	Whitechapel
1795	Sutton & Joseph Sharpe, King St., Golden sq.	Sutton Sharpe	Oxford Street
*1796	Cope's Mill ( <u>Neckinger</u> Street)	Cope	Bermondsey
1796	Griffin Brewery, <u>Liquorpond</u> Street	Meux Reid	Clerkenwell
1796	Oil Mill, Isle of Dogs, ( <u>2who</u> )		Poplar
1796	Sutton & Keen, Garlick Hill	Sutton & Keen	City
1796	Wallace's Mill, Brentford	Wallace	Brentford
*1797	Hatter ( <u>2who</u> )		<u>(2where)</u>
*1797	Kent Street, Southwark	Miles & Edwards	Southwark
1797	Thames Bank Distillery, Chelsea	Smith	Pimlico
1797	Allen (engine factory)	Allen, H	Blackfriars
1797	Kinman, Shoe Lane, Fleet Street	Kinman	Holborn
*1798	Cuckold's Point Ordnance Depot		Rotherhithe
*1799	Stag Brewery, Stag Place	Elliot	Pimlico
*1800	Upper Ground, Blackfriars		Blackfriars
1800	London Bridge ( <u>2who</u> )		Bermondsey
1800	Slater & Amhurst, Marble Hall	Slater & Amhurst	Vauxhall
*1801	City Bread Company	Bull	Islington
1801	London Mills and Ovens, Bagno Ct	Lloyd	City
1801	<u>Neckinger</u> Mill, Bermondsey	Koops	Bermondsey
*1802	Ratcliffe Highway / London Docks	<u>Leeky</u>	Wapping
1802	Stag Brewery, Stag Place	Elliot	Pimlico
1802	Thames Bank Mill (Straw Paper Co.)	Straw Paper	Chelsea
*1803	City Lands, Millwall	Bowman, Garforth, Bowman	Poplar
*1803	Giorgi, Seven Star Alley, Ratcliff Highway	Giorgi	Wapping
*1803	Hall's, Mary Row, <u>Bethnal</u> Green	Hall, William	Bethnal Green
*1803	King's Arms Foundry, <u>Narrow</u> Wall	Noble, Mark	Lambeth
*1803	Marylebone Workhouse	Guardians of the Poor	Marylebone
1803	Merton Mill		Merton
1803	Oil Mill at Merton		Merton
1803	Brewin, Willow Walk, Bermondsey	Brewin, F.	Bermondsey
1803	East India Docks, Blackwall		Stepney
1803	Greenwich Tide Mill		Greenwich
1803	Kinman, Shoe Lane, Fleet Street	Kinman	Holborn
1803	Swann & Co, Goodman's Fields		Aldgate
1804	Good Intent Mill, Isleworth		Isleworth
1804	Hawes Soap Works, Bull Stairs Wharf, Upper Ground	Hawes, Thomas and Benjamin	Blackfriars
1804	Leach, Bennet & Co, Merton Abbey	J. L. Bennet	Merton
1804	Rotherhithe nr Horse Ferry		Rotherhithe
1804	Scott's Distillery Vauxhall	Scott	Vauxhall
1804	Watson & Weymouth, Lambeth High Street		Lambeth
1804	Leach, Bennet & Co, Merton Abbey	J. L. Bennet	Merton
1804	Still, Princes Street, Vauxhall, Lambeth		Vauxhall
1805	Burchard Hilton Platt Montague Close	Burchard	Borough
1805	Martineau's Brewery, King's Arms Stairs	Martineau Brothers	Lambeth
1805	Parson and Gardiner, Saville Place Lambeth	Parson and Gardiner	Lambeth
1805	West India Dock Co		Stepney
1805	Woolwich Dockyard		Woolwich

*Notes to table 3*

*Source: Early Engines Database, and see text*

*\* First recorded in that year, could be earlier*

*This table is not available online but the full spreadsheet including sources is available from the Author – email [j.w.kanefsky@exeter.ac.uk](mailto:j.w.kanefsky@exeter.ac.uk)*

ed), and it would be fascinating to know more. An advertisement in 1801 (before Trevithick's high pressure engines appeared on the scene) promoted this activity:

“WHEREAS the Subscriber has lately erected three STEAM ENGINES (and has exported them to Demerara), which saves the Planter the necessity of having cattle mills, and places him independent of either wind or water mills. This is to inform WEST INDIA and SOUTH AMERICA PROPRIETORS and other Gentlemen concerned, that the Subscriber will be glad to receive orders, and undertake to execute them; and also the Sugar Mills, with justice and despatch.

“DAVID WATSON, maker of Steam Engines and Mill Work, Blackfriars Road.

“NB One of the Engines sent to Demerara was erected at Mr. Collinge's in Lambeth, and worked a Sugar Mill for the satisfaction of many Gentlemen who attended:- the Engines can be applied to Cotton Machinery &c.”<sup>15</sup>

That same year he was also involved in a court case involving one Edward Boyer Bull, who was building a mill and bakery in the City Road. Watson was contracted to build his steam engine for a total of £1,100 – £250 when it was finished, £500 when it started work, and the remainder in later instalments, but when he did not pay the stage payments Watson took the parts he had supplied back. Bull's assignees in bankruptcy sued Watson, to try get the components made part of the estate, but the latter won the case and presumably sold them on for one of the other engines we have been discussing.<sup>16</sup>

It is frustrating that we know nothing about what happened to Watson's business after 1805.

## Conclusions

There remains much work to be done on the industrial history of London in the period either side of 1800, when the pace of technological change (most notably the spread of engineering design, metallurgy and toolmaking) was very rapid. But the example of steam power and the wide variety of people and factories involved shows that a great deal can nonetheless be understood, even though most of the players have left few or no records and there are similarly almost no physical remains for the modern historian to see.

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*He is the author of several papers on eighteenth century steam engines, including a study of the “Norris Files” published by the International Early Engines Conference and one on engine building in London, published by the Newcomen Society.*

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