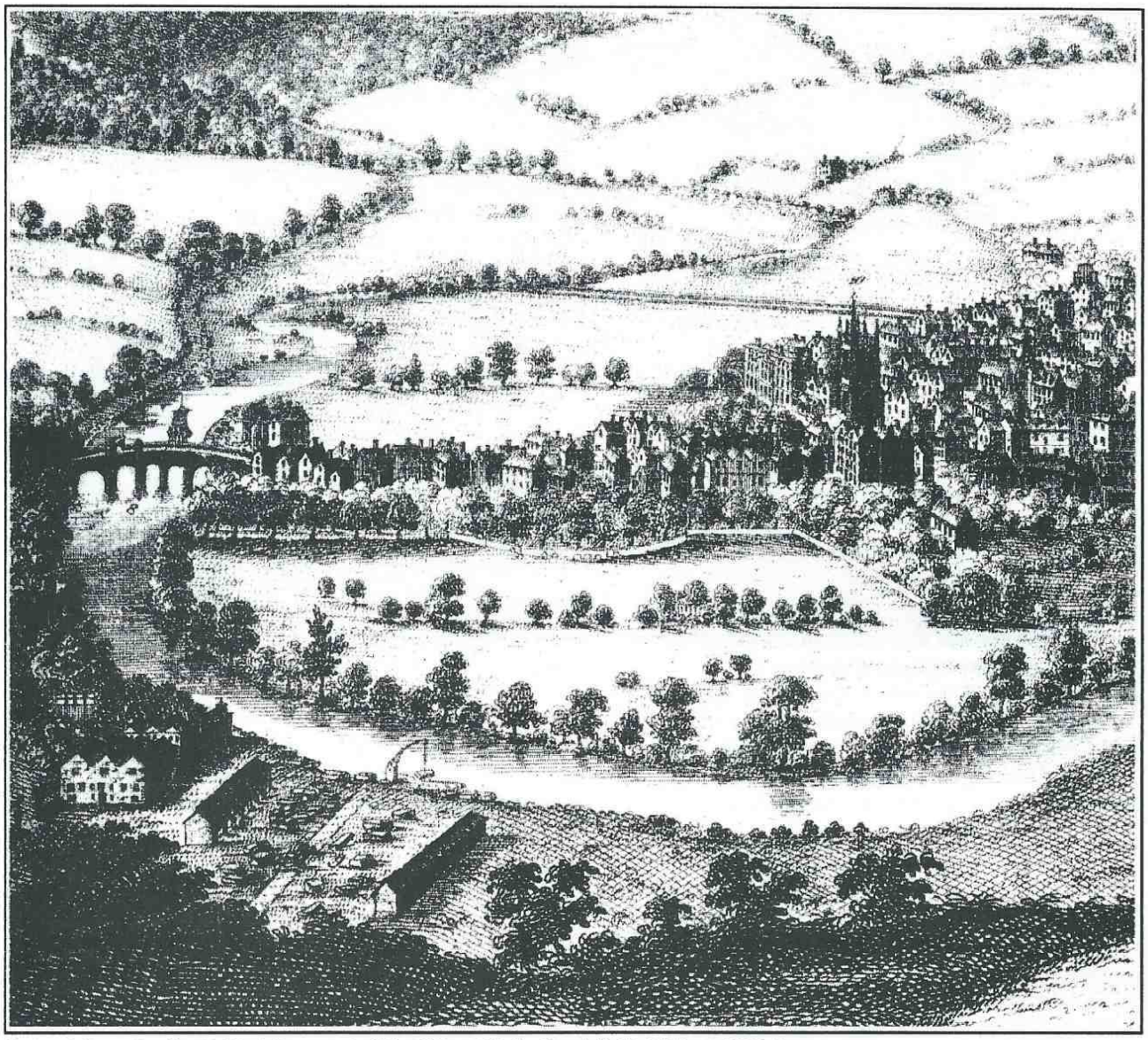
Mechanical Enterprise in Eighteenth-Century Bath



Extract from the South East Prospect of the City of Bath, Sam[l] & Nath[l] Buck (1734)

Trevor Fawcett

Not least among the reasons for Georgian Bath's meteoric rise were two simple machines: the pump and the crane.[1] After 1700 the spa cure centred less on bathing than on drinking the medicinal waters, preferably pumped hot from the source, an operation symbolised in the first Pump Room opened in 1706 and in the name of the official responsible. the Pumper, who also managed a large trade in bottled mineral water. The crane was a mechanisation of the pulley used for hauling blocks of stone out of the quarries and assisting its transport to dressing yards and building sites. Without cranes the volume of freestone to build Bath's extensive terraces, crescents and public buildings could hardly have been maintained.

Local braziers, ironmongers and tinmen were able to produce and repair small mechanical devices, but until the later eighteenth century any larger engineering jobs must have relied on expertise in Bristol and beyond. In 1694 the city's leading metalworker, John Axford, was presumably unable to recast the barrel of a fire engine the Corporation had been given. since the task went to Axford of Bristol instead. [2] Similarly the Twerton brassworks was less a Bath enterprise than an outpost of the Bristol brass industry, and Ralph Allen needed to turn to the Bristol manufacturer John Padmore for the horse-driven cranes used in the Combe Down quarries and the improved crane employed on his Dolerneads wharf.[3] Padmore was likewise commissioned by the Bath consortium who built the Dolemeads brewery to construct a malt mill and wort pump, also horsepowered.[4]

It is not known who manufactured the Lyncombe jewelling mill installed in 1737 at the comer of Ralph Allen's carriage road. though the operator, John Wicksteed. is always referred to as its 'inventor'. A visitor of l 743 called it a '*marshen* [machine] for Cutting Stone Seals by an

Inging [engine] *which goes by a water mill in his Garden*'.[5] Other industrial processes at Bath, especially the vital trade of ornamental stone carving, depended on the straightforward lathe,[6] and parallel devices must have been utilised in the developing manufacture of furniture, wheelchairs and carriages after 1750.

An item in the Chamberlain's Accounts for 1746/7 shows expenditure of £70 to Mr Atwood for an engine, apparently a large pump on Alderman Henry Atwood's land to draw up river water into a reservoir, with what success is uncertain.[7] Atwood had relatives in the local plumbing and ironmongery trades, who might have been involved in supplying the apparatus. A year later, following a destructive blaze in Queen Square, the Corporation spent another £13 on a horse engine for attending fires, and about the same time had a pump installed at the Cross Bath for spa patients.[8] These pieces might have been produced in Bath itself as expertise increased. though ironmongers and braziers also dealt extensively in Birmingham, Sheffield and London wares. A significant growth area was in heating and cooking equipment - grates, stoves, ovens, and 'smoke' or 'wind-up' jacks for turning spits. At least by the 1760s/1770s such items were often made in Bath workshops. The ironmonger John Atwood, for example. was advertising for a jack-maker in 1760 and perhaps bought the copy of W. Glossop"s pattern-book, The Stove-Grate Makers Assistant (1771) later in Richard Atwood's possession.[9] The braziers and ironmongers Benjamin Axford, John Dowding, Latty & Hallett, and John Harris all had active workshops. Dowding manufactured copper and brass furnaces before his bankruptcy in 1767, while Ann Freath & Son (continuing the brass foundry of John Freath in Horse Street) advertised in 1768 'Mill and Engine Work done in the compleatest Mamier' .[10]

The last quarter of the century saw a further development of engineering. By 1779 the firm of George Ford. 'Engine Makers'. was established in Bridewell Lane. specialising in fire-engines and pumps and supplying appliances to the Old Bath Fire Office. In 1782 he claimed his engines propelled a jet of water with twice the force of any rivals' apparatus, these coming in six sizes with still smaller devices for watering gardens and a variety of pumps for breweries and distilleries[11] (Ford may have been the source of the fire-engines in the Axfords' metalware shop in 1784 when Benjamin Axford retired and sold off stock that also included a turner's lathe. a clockmaker's cutting machine, and the new 'perpetual ovens', though all these items might equally have been manufactured in the Axfords' own [Old] Bond Street workshop. [12])

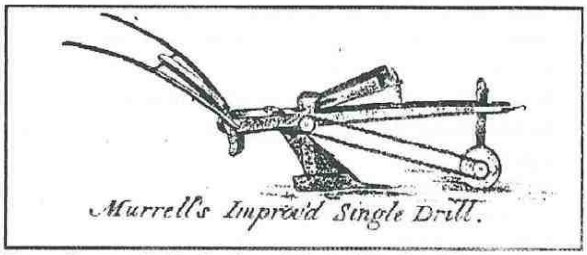
The Ford faintly remains to be fully elucidated. Charles Ford, brazier at the corner of Barton Street, was producing 'Bath' and 'Pantheon' stoves, ovens and jacks in 1785, but retired in 1787 and died a year later.[13] The carding-machine-maker John Ford moved to Bath from Frome in 1791 and set up in Milk Street in partnership with Samuel Ford to manufacture carding machines:

> *on a new and much-approved plan, for the great ease in turning, truth and steadiness of motion, dispatch of work and duration, with wood or iron arches. and not so much trouble to keep them at work as any other maker's, they being far superior in every respect*

- in proof of which they listed a score of manufacturers they had served in the Bath region.[14] The firm soon went bankrupt, victim perhaps of the national financial crisis of 1793. Among their manufactures listed at the ensuing sale were a 30-inch carding engine, a 28-inch double scribbling engine, and an automaton 'calculated to work an Engine, without the aid of manual labour', all of 'excellent workmanship'. George Ford, the fire-engine builder in Bridewell Lane, was then still in business.[15]

A more notable arrival of the period was George Stothert whose succession to the brazier, ironmonger and plane-maker John Harris has been charted by Hugh Torrens.[16] He made an early selling point of the ventilator attachment he had devised to fit perpetual ovens, and of various stoves and grates he manufactured (or rather. perhaps, 'assembled' from parts bought in from Coalbrookdale), 'particularly. the much-approved REGISTER STOVE with air-pipes for warming of rooms, on the same principle as the late SHARP's'.[17]

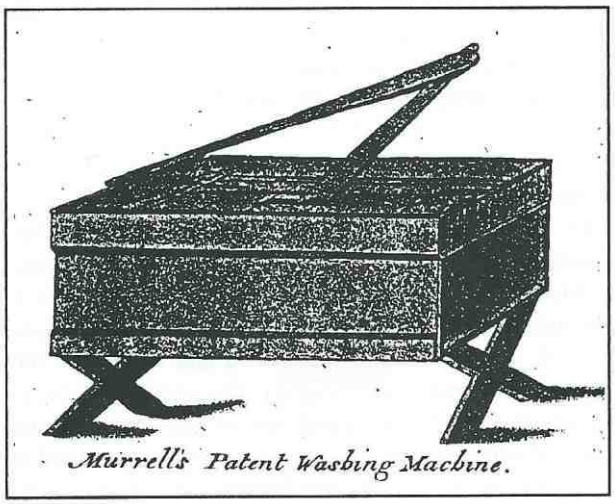
It took time before Stothert's inventive flair was brought to the attention of the Bath & West Agricultural Society[18], but the Society's premiums did stimulate other would-be innovators. Henry Murrell, a carpenter living in Morford Street. submitted two inventions in 1789: a machine for washing linen and an improved drill plough. both of which were duly examined and tested and the former awarded a small premium. The washing machine, by which, it was claimed, one 'stout boy' could do the work of four experienced washerwomen. was patented in 1790 and offered for sale in different sizes: it worked by boiling water and 'pressure only, and in such a manner as not to injure the finest linen or muslin, though by every motion of the Machine the linen changes into a different situation, which is certain of washing every part of the linen equally...'.[19] Eight years later. in partnership with William Deverell - a millwright and pump-maker on the Lower Bristol Road. Henry Murrell held the patent for a new type of lead-free water-pump. suitable for mines and wells and apparently worked by Messrs Streets' patent 'vapour engine' for which they were agents.[20] By 1802 Murrell's former partner was manufacturing steam engines himself with the firm Brough & Deverell on Bath Quay.[21]



From Cruttwell, R., *Bath and West of England Society Letters and Papers*, ed., (Bath, 1802) 2, p246

Other proofs of local mechanical inventiveness also came to notice in the 1790s: a cheap steam pump capable of raising 3,000-10,000 gallons an hour, a new line in water-closets, a portable handrnill for grinding corn, an improved perpetual oven.[22] A piling engine of unknown origin was employed in the reconstruction of Pulteney Bridge in 1800, and Hugh Torrens has drawn attention to an elaborate combination lock devised by Thomas Walters of Batheaston about the same date.[23]

Compared with contemporary technological advances elsewhere, these may sound small matters, but when taken with the more noticeable evidence of busy quarries and stone-carving yards, smoking brick and lime kilns on the city outskirts, the many furniture, coachbuilding, metalware and small engineering workshops, clock- and watchmakers, clay-pipemakers, soap-boilers, commercial breweries and distilleries, and a virtual factory complex at Twerton, it is clear that industrial culture had already infected Bath well before 1800 even if spa publicity liked to pretend otherwise. The city's nineteenth-century manufactures had a structured base from which to develop.



References

1. To these two might be added the vehicle carriage, since the transport of visitors and goods to and from the spa depended on the craft technology of wheels, axles and suspension. From c1750 quality coachbuilding developed into a significant Bath industry.
2. Bath Record Office, Bath Chamberlain's Accounts 140, 14 February 1695, Axford of Bristol paid £1-15s for new casting the barrel of the 'Ingen'. Bath's John Axford arrived from Rode in 1664 and henceforth regularly supplied the Corporation with small metalware orders; he became Mayor in 1696.
3. Described and illustrated, with Allen's tramway, in Desaguliers, J .T.,*A Course of Experimental Philosophy*, 2nd ed. (1745), 1, 187-9, 283-8, plates 12,16, 21-2.
4. Mentioned when the brewery equipment was later sold: see *Bath Journal*, 19 March 1749/50.
5. Bristol Reference Library, 'Diary of an Unknown Traveller' , 20 Sepember 1743, MS. in Pb/A.S.R.38, B 22211. In use until 1773.
6. Martin, B., 'The natural history of Somerset' in The Natural *History 0fEngland* (1759) 1, 71.
7. Bath Record Office, Bath Council Minutes, 12 November 1743, 17 February 1743/4, 10 October 1745.
8. Bath Record Office, Bath Chamberlain's Accounts 1747/8; Bath Council Minutes 29 June 1747, 20 January 1747/8, 28 March 1748.
9. *Bath Journal*, 6 October 1760;
   Richard Atwood later signed the copy of Glossop in Bath Central Library.
10. Dowding advertised in *Bath Chronicle*, 12 April 1764 and 23 October 1766, Anne Freath & Son in *Bath Journal*, 27 June 1768
11. *Bath Chronicle*, 29 April 1779;
    Bath Journal, 13 and 20 May and 10 June 1782;
    For fire-engines see also Fawcett, T., 'Fires, fire fighting and insurance in 18th-century Bath', *Somerset & Dorset Notes & Queries*, 34 (1997) 125-31.
12. *Ibid*, 1 Jan 1784;
    A rival ironmonger, Samuel Hallett, certainly made perpetual chimney ovens;
    Ibid. 12 December 1782.
13. *Ibid*, 3 March and 10 November 1785, 15 February and 14 June 1787, 29 May 1788.
14. *Ibid*, 1 December 1791 and 19 April 1792.
15. *lbid*, 4 and 25 July 1793, 6 February and 7 August 1794.
16. Torrens, H., *The Evolution of a Family Firm: Stothert & Pitt of Bath* (Bath, 1978) 2-3.
17. *Bath Chronicle*, 7 July 1785.
    For his Coalbrookdale supplies see Torrens, note 16, 8-10
18. *Ibid*, 16.
19. Bath Central Library, Bath & West Agricultural Society MSS, General Meetings, 14 April, 18 Sepember, 10 November, 1 and 8 December 1789;
    Bath Chronicle, 7 January, 1 April and 19 August 1790, the latter announcing work on a cheaper version.
20. *Ibid*, 8 March 1798.
21. Neale, R.S., 'The industries of the city of Bath in the first half of the nineteenth century', *Proceedings Somersetshire Archaeological and Natural History Society*, 108 (1964), 142.
22. *Bath Chronicle*, 9 December 1790, (steam pump: Rev Mr Hawes of Box);
    Ibid, 11 July 1793, (water-closet: Richard Chatterton);
    Bath & West Agricultural Society, note 16, General Meeting, 14 June 1796 and *Bath Chronicle*, 15 Sepember 1796, (handmill: Mr Weaver);
    Ibid. 30 January 1800, (oven: Robert Darby).
23. *Bath Journal*, 11 August 1800;
    Torrens, H.S., 'Engineering enterprise at Bath and Bristol', *Industrial Archaeology Review*, 11 (1989) 196-209.