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# THE FIRST HEATED SWIMMING POOL IN MODERN TIMES?

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What may be the first heated swimming pool of modern times was built in 1707, by Sir Godfrey Copley, Bart., of Sprotborough Hall, Yorkshire. Although it has been previously identified (and attributed, without evidence, to the engineer George Sorocold),<sup>1</sup> Copley's correspondence, particularly with his architect, John Etty, reveals that it was the fruit of philosophical exchange between a group of Fellows of the Royal Society.

Copley succeeded his father as second baronet and owner of Sprotborough Hall, three miles west of Doncaster, in 1684. He had an active public life, as MP for Thirsk from 1695 until his death in 1709, and he was Commissioner of Public Accounts from 1701, and Controller of the Accounts of the Navy from April 1704. But he was equally active in scientific speculation, becoming a Fellow of the Royal Society in 1691 and corresponding with Sir Hans Sloane until his death.<sup>2</sup>

His correspondence reveals his passionate interest in all things hydraulic and hydrostatic. The first indication is a plea to Sir Hans Sloane in November 1694 for a copy of Edmé Mariotte's *Traité du mouvement des Eaux et des Autres Corps Fluides*:<sup>3</sup> 'if any of ye french booksellers have it or can get it I beg you will buy it for me'.<sup>4</sup> In 1695 he wrote to Cyril Arthington, of Arthington Hall, Yorkshire, 'to give my service to Mr Kirk & when he sees Mr Saracole to let him know I should be glad to see him. if his businesses would allow it. I beg a line from you, how you find Mr Saracole's work go on and succeed'.<sup>5</sup> Arthington was also a Fellow of the Royal Society, and was just then building a remarkable house on a sloping site

above the River Wharfe; Ralph Thoresby, the Leeds antiquary, and another FRS, wrote that he 'furnished [Arthington Hall] with water conveyed in pipes of lead from an engine he has contrived at his mill on the River Wharf, being an ingenious gentleman, and well seen in hydrostatics'.<sup>6</sup> Thomas Kirk, antiquary and scientist, was another Fellow of the Royal Society, and constructed a 'labyrinth' on his land at Cookridge, near Leeds, where he had previously found Roman remains; after his death in 1706 his son sold part of the property to Arthington, who found more remains there.<sup>7</sup> Saracole was obviously 'the ingenious Mr George Sorocold, the Great English Engineer', as Thoresby described him, responsible for bringing piped water to a number of towns and cities, including London, at both Marchant's and the London Bridge Works. Henry Beighton, another civil engineer, reckoned Sorocold's London Bridge Works, designed in 1701, to be superior to the *machine de Marly*, which provided water for the gardens at Versailles. In 1694–95 Sorocold had worked in Leeds, where he was closely monitored by Thoresby, Arthington, Kirk and Copley.<sup>8</sup> On 3 March 1696 Copley visited Marchant's Waterworks on the Thames and wrote to Kirk that 'I have been this day and am to meet tomorrow, Mr Saracole and Mr Hadley. I have seen his engine ... I do think the best piece of work I have seen'.<sup>9</sup>

Copley had recently re-built his home at Sprotborough, on a river cliff above the Don (Fig.1). His architect may have been John Etty of York, who is mentioned a number of times in his letterbook.<sup>10</sup> Copley was now turning his interest to laying out his

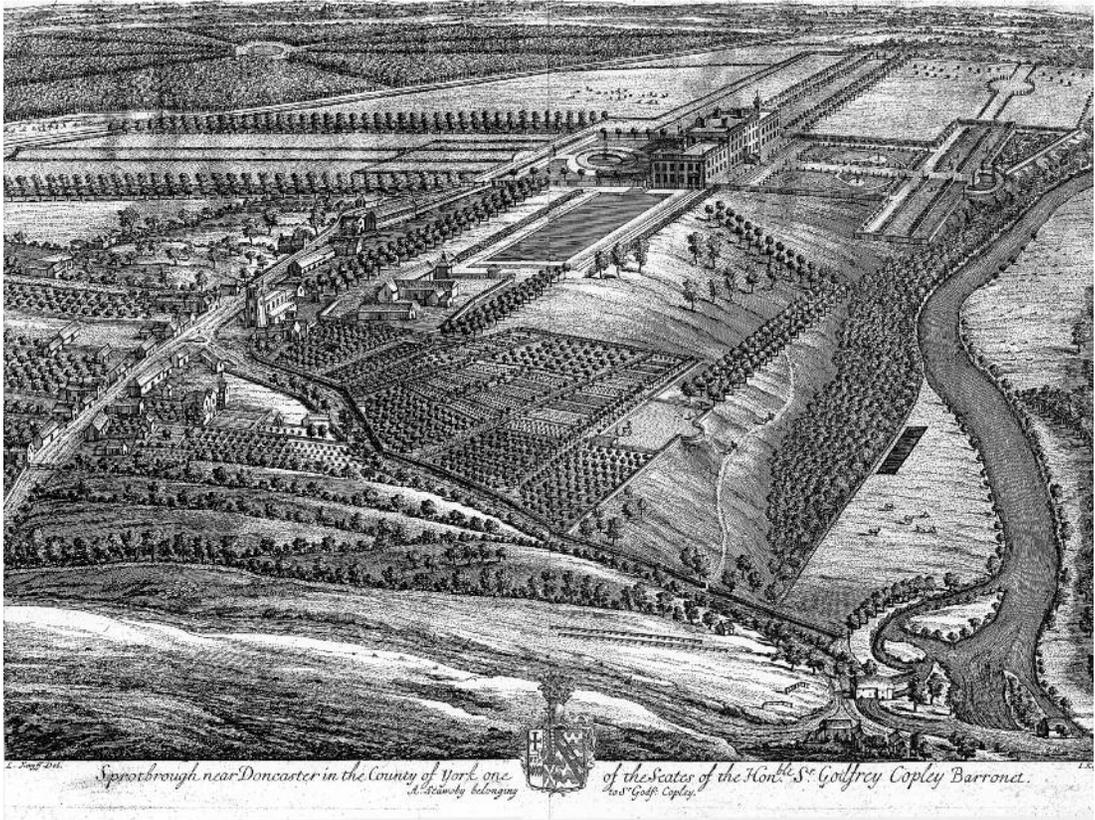


Fig. 1. L. Knyff and J. Kip, Sprotborough Hall, engraving, 1707.

garden with canals and fountains, hence his interest in Sorocold, who has recently been shown to have engineered private gardens, as well as the docks and public water supplies for which he was previously famous.<sup>11</sup> There is no evidence to show that Sorocold was directly involved in the provision of an engine at Sprotborough; rather, his discoveries were carefully examined, tested and acted on. It is likely, however, that Etty was involved. Etty was evidently interested in the movement of water, as he wrote to Copley in 1701 asking if he could borrow his copy of Mariotte while he was laid up with a broken leg.<sup>12</sup> His interest is confirmed by a letter from him to

Copley in 1704 discussing at some length the preferred type of ‘barrells ffor your Ingine’.<sup>13</sup> He recommended the use of a founder who had made an engine ‘by my design’ for Sir William Robinson; Etty had worked for Robinson at Strensall Hall, Yorkshire, and possibly at The Red House, York, although unfortunately no gardens remain there.<sup>14</sup> He continued by suggesting that the ‘Barrills [be] made of wood and the Howsings made of Brass to work as ours does at York’. He concluded ‘But ffor your Ingine I doo approve of it the Best that I have yett seen: yett there is som small errors in the mannagement that may be Avoided in an other’.<sup>15</sup>



Fig. 2. Detail of the *Survey of the River Dunn*, 1722, showing the water engine and canal at Sprotborough Hall (from T.S.Willan, *The Early History of the Don Navigation*, Manchester, 1968).

By that time much had already been achieved. In March 1703 Thoresby reported on a visit to Sprotborough:

viewed the most pleasant gardens and curious fountains, statues etc; then assisting Mr Kirk and Mr Arthington in taking a level for the new canal that is now making from the water-engine (which is very curious and conveys water to a large lead cistern upon the roof of the hall, a vast height from the foot of the hill) to the corn-mill, whence he can go by water to Coningsburgh Castle on one hand, or Doncaster on the other.<sup>16</sup>

This brings us to another aspect of Copley’s interest in hydraulics. In January 1697 he presented a bill to Parliament for the improvement of the river Don, which would provide a navigable passage from Sheffield to Hull. Unfortunately it was defeated and it was not until 1726 that an act was passed.<sup>17</sup> It would

seem that Sir Godfrey was not to be thwarted and that he built his own canal or ‘new river’, as he refers to it in his letterbook on 22 October 1703.<sup>18</sup> A small canal and lock are to be seen on *A Survey of the River Dunn*, dated 1722 (Fig. 2). The presence of the canal is confirmed by the 1726 Act, being listed among the limitations imposed on the undertakers:

To prevent damage to the mills and water engine at Sprotborough belonging to Godfrey Copley, the undertakers were to preserve the canal that supplied the engine with water and were to make a lock and floodgates to keep a head of water. In dry seasons Copley could keep this lock closed between 6 and 10am and so stop the passing of boats during that time.<sup>19</sup>

Copley’s water engine was contained in a masonry structure, which still survives. It houses the remains of an undershot wheel, 15 feet in diameter and 3 feet

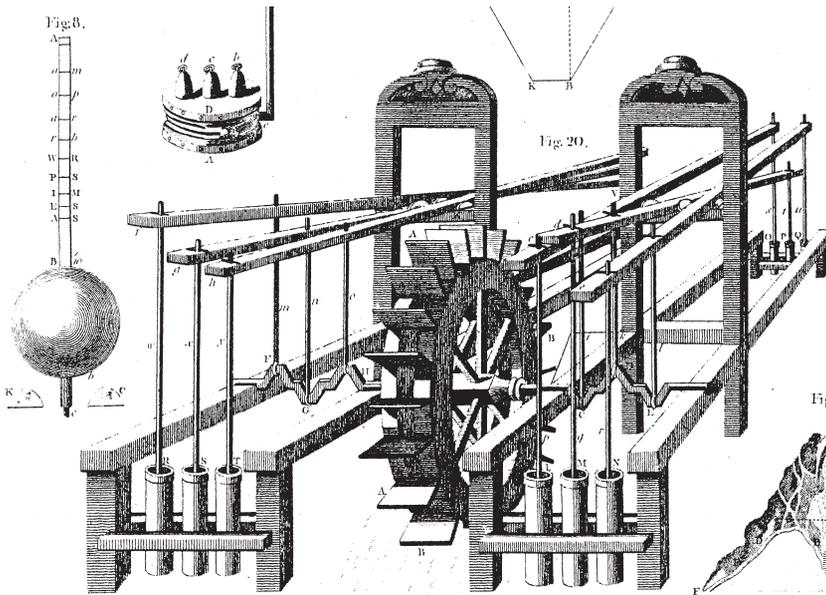


Fig. 3. John Aldersea's engine in the Grand Bridge at Blenheim Palace (from William Henry Hall [ed.], *The New Royal Encyclopedia*, n.d.).

wide, of iron and timber construction. It is fed by a leat, probably along the line of the original canal, as mentioned above. The mechanism seems to have been adapted to drive a later (nineteenth or twentieth century) three-barrelled pump. The original arrangement was probably similar to John Aldersea's pump in the Grand Bridge at Blenheim, installed in June 1706 (Fig. 3), and would have lifted the river water from the engine to the house reservoir on the roof.<sup>20</sup>

On 4 September 1703 Copley wrote that 'I have done my fountaine in ye Court & shall bring ye Water in on Monday or Tuesday next. I should have been glad Mr Arthington would have seen how our jet would rise'.<sup>21</sup> Work continued through the autumn, including a covering for the engine as 'the engine can't work untill ye house is covered'.<sup>22</sup> This was successfully resolved by 17 November: 'ye water house all done: holds well'.<sup>23</sup> And on 10 December

he noted that 'the engine works very well and that the canall and fountain shall be filled'.<sup>24</sup> This may refer to the little canal 'next ye tennis court,' which was completed on 27 November.<sup>25</sup>

The following year more work was contemplated, as he wrote to Thomas Kirk on 29 May 1704

There are severall pieces of work done here since I went to London on ye west side of ye house, but I am att a stand and cannot tell what to do. I cannot tell how to go forward with ye new ground between ye canall and the brink of the hill, but I shall destroy the view of ye New River from ye great dining room dore which I would not do, if I could avoid it & all my work staves for my resolution in this point & it goes much against my mind to alter it before I have the favour of your good company to advise me in a matter that I think of so great consequence & that requires so sudden a resolution.<sup>26</sup>

At the same time, he continued to search for improvements to the engine in correspondance with

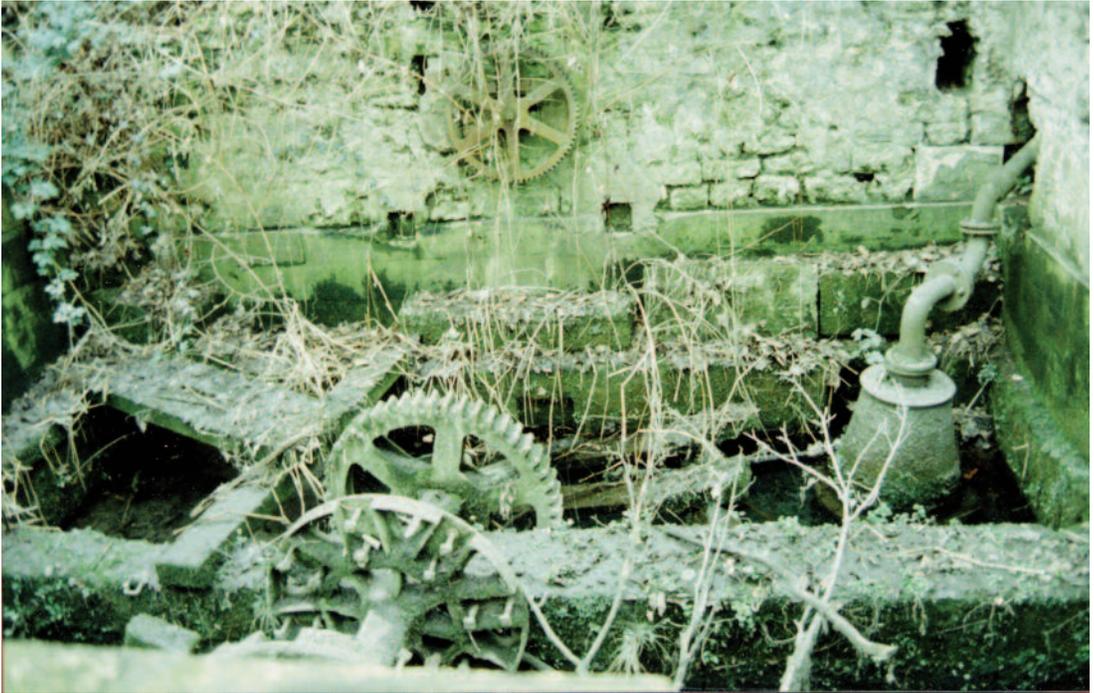


Fig. 4. The water engine at Sprotborough Hall, showing the air vessel and the gearing for a later pump.  
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Etty, and with his uncle, William Walmsley, of Dunkenhalgh, Lancashire.<sup>27</sup> In an undated letter, Walmsley wrote,

butt above all, I know it would delight you to see Mr Barlow and his water engine, which doth Woonders with the most ease imaginable. he would inform you how to make a C--- that could never wilt or over burn, with sum other Curiosities mighty rare, and impracticable by any man that is not toght by him.<sup>28</sup>

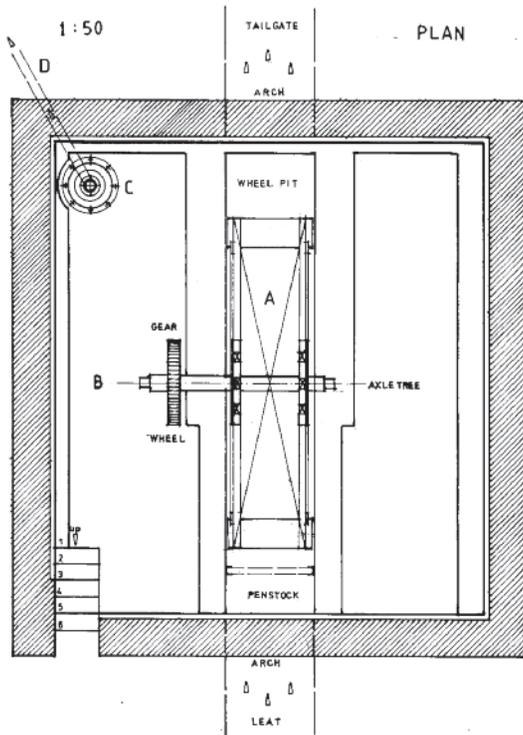
To which Sir Godfrey replied on 19 July 1704:

You say I should be very glad to see Mr Barlow & his water engine for raising water, & truly so I should, I wish it were in my Power to make any sort of return to Mr Barlow that might induce him to communicate something of this matter to me. my desire is purely for my own use, not that I would make it further known, for if it would with the same force treble or Quadruple the water I now have, as I have been told it will, I would give any reasonable thing to put it in practice, &

if You would please to try whether you could get me some answer to the enclosed by Wch I would only desire to know what improvement he might think it capable of [line inserted] lay before him what wee do by a mill wheel.<sup>29</sup>

Copley's enclosure is a description of the engine that they were currently using.

Unfortunately no further surviving correspondence indicates whether Mr Barlow succumbed to Sir Godfrey's pleading, though there is a hint in Sir Godfrey's letter book on 22 June 1706: 'To my Uncle WW . . an enquiry after ye successe of Mr Bs engine, that I am attempting a Tryall of it here'.<sup>30</sup> 'The Tryall' is probably represented by the rivetted iron air vessel extant in the north-east corner of Copley's engine house (Fig.4, and C in Fig. 5). This may have enabled water forced into the vessel from the crank operated pistons to compress air within, and thus



- A. early nineteenth-century water wheel · iron axle · timber arms/floats
- B. pump chamber
- C. iron air vessel
- D. delivery pipe

Fig. 5. Plan of the engine house at Sprotborough Hall. *Leo Godlewski.*

result in a constant rather than intermittent flow through the delivery pipe (D in Fig. 5). The water was then driven through the pipework to supply the house cistern, garden, fountains and other water features 150 feet above the Don.

Sir Godfrey’s pumping experiments must have been a success, for the next project he undertook was the great bath. He described it in a letter to Sloane written on 3 September 1707.

I have succeeded past my expectation in making such a bath for pleasure and convenience as I think no one in this kingdom hath ye like. It is between 34 & 35 foot long & about 16 foot broad with a convenient pair of stairs to go down to the bottom & sides lined with lead & holds water six foot and four inches deep, but when wee use itt for bathing and swimming wee fill it but to 4 foot & half, which the water engine will do in less than 5 hour. Two or three faggots and a sack of coales doth warm it equall to ye heat of your body but we can make it hotter if wee please. I never met with any bath

more agreeable & there is roome enough for four or five to swim up and down very well. I have gone in severall times, & it is very pleasant in an evening or morning. My wife and some Ladys of her acquaintance have gone in together & are much delighted with it.<sup>31</sup>

From these figures it can be calculated that the Sprotborough pump was capable of pumping 52 gallons per minute.<sup>32</sup> The description concludes, ‘I am sure this fancy of mine will be followd by some who perhaps may be willing to outdo me in making one 3 times as large.’ As far as we know, no one did. Why not?

#### ACKNOWLEDGEMENTS

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## NOTES

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- 5 BL, Sloane MSS, 4036, fol.188.
- 6 D.H.Atkinson, *Ralph Thoresby, the Topographer; his Town and Times*, Leeds, 1887, II, 69; Elizabeth Hagglund, "Cassandra Willoughby's visits to country houses", *Georgian Group Journal*, XI, 2001, 190–1.
- 7 Ralph Thoresby, *Ducatus Leodensis*, Leeds, 1715, 158; *DNB*, XI, Oxford, XI, 1887, 216; Atkinson, *op. cit.*, n. 55.
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- 9 BL, Stowe MSS, 747, fol.66.
- 10 Sheffield, Sheffield Archives (hereafter SA), Copley Deeds (hereafter CD) 473.
- 11 Hagglund, *op.cit.*, 200, n. 39; documents in private hands, seen by Richard Hewlings.
- 12 SA, CD 473. This letter has been previously interpreted as a request for another book, the volume of engravings of the French architect Jean Marot [Howard Colvin, *Biographical Dictionary of British Architects 1600–1840*, New Haven and London, 1995, 354].
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- 14 Colvin, *op. cit.*, 354.
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- 21 BL, Stowe MSS, 748, fol.14.
- 22 SA, CD 473.
- 23 *Idem.*
- 24 *Idem.*
- 25 *Idem.*
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- 28 DA, DD/CROM/Box 138/Bdl.21.
- 29 *Idem.*
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- 32 I am indebted to Leo Godlewski for this calculation.