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STEAM LEADS THE WAY

THE STORY OF THOMAS NEWCOMEN

In 1685 a young man, aged 22, named Thomas Newcomen, returned to his native town of Dartmouth and set up business as an ironmonger. It was a fateful year for the Baptists, the nonconformist congregation to which Newcomen belonged. He did not remember the heady days of the Commonwealth, when some Baptists daily expected the coming of "The Kingdom". When all those hopes seemed to have collapsed at the Restoration of 1660, the poet John Milton had counselled the patient reliance on the Word and Spirit of God, rather than the sword. The "Lost Paradise" could be "regained" but only by following a lawful vocation diligently applied to the solution of practical problems, as Francis Bacon had prescribed. So Newcomen became an "iron-monger"! (In this he followed the example of John Bunyan, the "iron-monger" of Bedford).

It proved a wise choice. In 1685 many of the less prudent sort of Baptists in the south-west rallied to the standard of the ill-starred Duke of Monmouth. Many of them fell around that standard at Sedgemoor and many more were later hunted down and brought before the "Bloody Assize" of Judge Jeffries. The wiser sort took no part in the rising, trusting God to see them through to the calmer waters of Toleration. Time was on their side and Judge Jeffries was unwittingly hastening the ruin of his own cause, for in the south-west, and elsewhere, men were sickened by the work of the "Bloody Assize". Some were turning towards the kinder views of Arminius Episcopius and others of the Dutch Remonstrants that not just a few, but all their neighbours, might find a place in the Kingdom of God. The balance had been tipped slightly away from the extreme Calvinism which followed the Reformation and against the rule of a persecuting church, whether Catholic or Protestant. The sun was rising on a new age. But even some now waking still dreamed of the past. Newcomen and his friends were actively preparing for the future.

Life was already stirring on the quays at Dartmouth. Ships may have come in on the tide. The fishing industry was unfortunately declining and few local men spent weeks supping rum while fishing off the Newfoundland coast as in the days when Dartmouth was second only to Falmouth in the trade. The shipyards of the Dart were often idle since the New Englanders had begun to compete with them from centres like Newport, Rhode Island. Still there was always news on the waterfront. Dartmouth still faced the New World, as it had in 1620 when the Pilgrim Fathers called there on their way to found New Plymouth. The Atlantic trade in fish, port-wine, molasses, slaves, and woollen goods continued. Families of emigrants also set out from time to time to try luck or providence in the colonies.

There was also coast-wise shipping, linking ports on the Dart with those on the Severn, Stour, Weaver, Tyne and Clyde. War gave industry and shipping an artificial boost from time to time. Privateering was also a way of increasing profits,

even in peace time. The young Newcomen was able to build up an honest business by supplying both landsmen and seafarers with iron ware. He was aware of a bustling new world at his feet, on the quays at Dartmouth.

Three years after Newcomen's return to Dartmouth, William of Orange landed unopposed at the nearby port of Brixham in Torbay. The West Country did not rise as it had for Monmouth, but there was no need to do so, for King James had fled. The flight of James left the east of England in chaos. Order and purpose surrounded William in the West and Dartmouth remained calm. England was moving nearer to the Dutch example of Toleration which became the model for the "New World" on both sides of the Atlantic.

The wars which followed in Ireland and on the continent of Europe did much harm, but they stimulated activity in the harbours at Dartmouth and other ports in the south-west. During this time the demand for iron goods increased and Newcomen's business expanded. Between 1694 and 1700 he built up a considerable trade with the iron-masters on the River Stour in Worcestershire. He also built up a strong relationship with the Baptists of those parts. He had already entered into partnership with another Baptist, John Calley, a local plumber and glazier. The business had grown too large for one man.

In 1698 Thomas Savery, a neighbour of Newcomen's, patented an "engine for raising water by fire", an invention which must have been fascinating to the future engineer, seeking to improve the world by his own efforts and innovations. (The subject-matter of the patent was: "Raising water and giving motion to mill-works by the impellant force of fire..."). Savery belonged to a family of merchants in Totnes, the ancient market town established at the first ford on the River Dart a few miles up-river from Dartmouth. His family owned two farms at Shilston and Spriddlescombe, not far from Marlborough where Newcomen found Hannah Waymouth, who became his wife.

Savery was a considerable inventor. It is possible (though there is no convincing evidence) that he and Newcomen were both pupils of John Flavell of Bromsgrove, the famous nonconformist scholar whom Elias Newcomen, the father of Thomas, had, with others, persuaded to come to Dartmouth in 1656. Flavell was well-known throughout the South Hams (as the district is known) as an itinerant preacher and teacher based at Portlemouth during the period after 1660 when he was banned from Dartmouth under the Five Mile Act. Prior to that he had preached at St Saviours, the parish church of Dartmouth. There is in fact no evidence that Savery and Newcomen had met at this time, but it seems likely. Their work was complementary and they later became partners in the patent. Their meeting may have inspired Savery to extend his patent in 1699.

In 1705 Newcomen was married to Hannah Waymouth. History is mainly written by "male chauvinists" so little is known about Hannah, but Marlborough is close to Portlemouth, so we may assume the common influence of Flavell in their backgrounds. In 1707 Newcomen leased a large house in Dartmouth, part of which was used as a Baptist meeting house. In this he was probably

encouraged by the warmer climate of toleration. Perhaps the steam engine gestated here in Newcomen's fertile brain, though the actual work took place elsewhere. At any rate the "locals" spread the tale that it was by the hearth of this house that Newcomen discovered the power of steam by observing the kettle on the "hob". The same story is told of James Watt, but he did not originate the steam engine nor "discover the power of steam".

It is unlikely that Hannah "brewed" cups of tea for Thomas and his friends around that hearth, but its importance was recognised by Thomas Lidstone who placed its lintel over his own fireplace in Dartmouth in 1868, so that it would be preserved for posterity, after Newcomen's house was demolished. We may imagine that Newcomen, Calley, and perhaps Savery discussed inventions round the fire, with Hannah busy in the background or taking part in the discussion. The warmth of the hearth reflects the warmth of the affection expressed by Newcomen in 1727 in a letter to his family, preserved in the Dartmouth Museum. This letter refers to a Mr Lidston, perhaps an ancestor of Thomas Lidstone, the Dartmouth historian, who preserved the lintel, and also perhaps the source of the "folk tale". (If so, a contemporary witness!).

In 1705 Thomas Savery became treasurer to the "commission for the sick and wounded" in the War of the Spanish Succession. This organisation had agents in all the leading seaports in the country, including Dartmouth, where Newcomen may have come into contact with him in his capacity as Overseer of the Poor. If Newcomen knew him already, as seems likely, it would be natural for them to meet and discuss their common interest in steam. The steam engine project began to develop about this time. The first definitely known example of a Newcomen engine was installed near Dudley Castle in 1712. It must have taken more than seven years to reach that point in its development. By the time the patent expired in 1733, more than one hundred engines had been manufactured. Even one engine would be inconceivable without organisation, so we must abandon the perspective of the one-man enterprise in order to arrive at the result.

In spite of some contrary opinions, it is probable that Savery and Newcomen were working together. Savery's "engine" is better described as a "steam pump". It was not a great success as it could not raise water from a depth greater than twenty feet. It did not embody the principle of a piston driven by steam and atmospheric pressure as Newcomen's engine did. Yet Savery's unsuccessful experience was very valuable. Newcomen, as a disciple of Bacon and Milton, knew that success must be won from failure. (This is the principle enunciated by Milton in "Paradise Lost", "Paradise Regained" and "Samson Agonistes", the three great poems which he wrote after the failure of all his hopes in 1660). So Newcomen was the best possible complement to Savery. His faith was able to sustain the venture. He and his partner, John Calley, also brought practical experience of working with iron and a knowledge of the trade.

In these years, 1705-11, there was a revival of tin mining in Cornwall and the area of Dartmoor in Devon, close to Dartmouth, including Ashburton, Tavistock and Widecombe. Tin

mining in Cornwall sorely needed improved pumping equipment as the mines became deeper. "Horse" power was no longer effective. There is no evidence of a Newcomen pumping engine used in Devon, but Newcomen and Calley may have supplied the mine owners with other equipment. They were aware of drainage problems and may have installed an engine at Wheal Vor, Breage, in Cornwall where it worked from 1710 to 1714. The word "engine" then implied a "product of ingenuity", not necessarily including moving parts. They had obviously "perfected" the design before selling it to the proprietors of the mine near Dudley Castle. So by this time the "firm" was established.

Savery died in 1715, leaving his affairs in the hands of his friend John Meres, clerk to the Worshipful Society of Apothecaries of London. Meres launched a joint stock company to finance the future expansion of the market for steam engines and to ensure that Savery's widow received an annuity until the time of her death (aged 104) in 1759. The committee (or board) of the Joint Stock Company included the following members: Thomas Newcomen, John Meres, Edward Elliott, Thomas Beake, Henry Robinson, William Perkins, Cornelius Dutch, Ezekiel Trengrove and Edward Wallin. Wallin, Robinson, Newcomen and Trengrove were all Baptists. As many other Baptists were concerned with the production and management of the engines, we may safely say that the Baptist faith was highly significant in the development of this engine. In other parts of the country, the Baptist network seems to have been alerted. Everywhere the Baptists seem to have co-operated, responding to the call to promote the advance of the steam engine.

They seemed to identify with the miners and mine owners in their problems and they seemed to be committed to the enterprise launched by their fellow-Baptists, Newcomen and Calley. It was as if they were aware of the promise of the industrial revolution. Of course, it is only in retrospect that we can see the results of their work. Looking back, we can see the harmful, as well as the beneficial, results. The pioneers could see neither. It was, however, their positive attitude to the problems that faced them that led the way to the "New World" of industrialisation. The world of the future is shaped by those who adapt to the challenge of the present. Bromsgrove and Dartmouth formed two primary nodes of a network. Bromsgrove had been the home of John Flavell, and was Newcomen's "second home". The Baptists of Bromsgrove identified strongly with the engineers. The enterprise of Newcomen became their enterprise. They included John, Abraham and Humphrey Potter and others of the same family, also Joseph and Jonathan Hornblower and their descendants. These groups of Baptists seem to have believed that men must work out their own salvation and that others could then share in the fruits. In this they followed Francis Bacon.

Why did these seventeenth century Baptists turn to engineering? It is hard to resist the conclusion that their theology may have had something to do with it. Weber and Tawney claimed to have discovered a link between Calvinism and the rise of industry, namely the "work ethic". According to this view, the "elect" to salvation were required to "make their

calling and election sure", by displaying sober and industrious habits. "What is required of the Puritan", writes Tawney, "is not individual meritorious acts, but a Holy life". His conception of that life was expressed in the words, "Be wholly taken up in diligent business of your lawful callings...". But this begs the question why some Baptists felt a "lawful calling" to enlist in Newcomen's enterprise as engineers.

To understand the motivation of these Baptists, we must try to put ourselves in their place. They were the successors of a generation who had believed in the "millenium", which was widely expected to begin with Christ's second coming, around the year 1658. It is hard for us to appreciate the depth of disillusion they suffered after 1660.

The execution of Charles I in 1649 was certainly (in a sense) the end of an era. Many Baptists considered themselves "prophets" who had heard the inner voice proclaim the imminent return of Jesus Christ. James Nayler had actually declared himself the "Lord" and entered Bristol "riding on an ass" in 1656, with women strewing palms before him. (Nayler was not a Baptist but a Quaker, but his was not an isolated gesture). The "everlasting gospel" of the "third age" (the "age of the Holy Spirit") was widely proclaimed at that time. England was to become a "nation of prophets". In 1660 the restoration of the monarchy shattered the dream and left Baptists, in particular, a disappointed and scattered flock.

There have probably been "millenarian Baptists" at many times in history. (After all, John the Baptist's own disciples suffered a similar experience, and enquired of Jesus whether they had been mistaken!). It is particularly difficult for the next generation to pick up the threads after the confidently expected millenium has failed to materialise. Thomas Newcomen was pastor to the scattered flock at such a time. Up to 1685 Baptists in the south-west had probably hoped against hope. Perhaps, after all, they believed "King Monmouth" might save them. Instead Sedgemoor and Jeffries destroyed them. Like Samson, they had brought down the "temple" on their own heads.

In that same year Newcomen returned to Dartmouth to work on the steam engine. He became a leader because he did not despair. He may have read the words in Bunyan's *Holy War* (1682): "Therefore we dare not despair, but will look for, wait for, and hope for deliverance still". Perhaps his old teacher, John Flavell had taught him what he had learned from Milton's "Treatise on Education", that knowledge would undo the consequences of the Fall of Man. He may have read in "Paradise Lost":

> So virtue given for lost,
> Depressed and overthrown...
> Revives, reflourishes, then vigorous most
> When most unactive deemed.

Like Simon Peter when his hopes were dashed, he turned again to his trade, and like others found salvation in work as well as faith. He may have been one of the true prophets of this gospel, for he seems to have brought fresh hope to the scattered forces of the Baptists. None of them could have known that they were creating, in the industrial state, the conditions for an

extension of freedom inconceivable before. They were also unaware of the new possibilities of inhumanity which industrialisation would bring. By strange paths pastor Newcomen was leading his scattered flock to pastures new.

Truth is certainly stranger than fiction. If this were fiction, it would be easy to picture pastor Newcomen and twelve Baptist apostles deliberately planning and engineering the "exodus" from the old world and the entry into the "promised land" of the industrial future, preceded by a "cloud of steam" by day, and a "pillar of fire" by night!

In fact they did not plan it at all. Perhaps Moses would also have been surprised at the results of his Exodus. Looking back, it is hard to avoid the conclusion that the results achieved by the seventeenth century engineers were just as significant as those achieved by the ancient Israelites. The world to which "steam led the way" was surely a "land of promise".

BIBLIOGRAPHICAL NOTE

The authorities on Thomas Newcomen and his steam engine are the late L. T. C. Rolt and his successor and editor, J. S. Allen. Rolt's *Thomas Newcomen, The pre-history of the Steam Engine* (1963) gave rise to my original interest in the subject. It has since been revised and brought up to date by J. S. Allen in Rolt and Allen's *The Steam Engine of Thomas Newcomen,* Moorland Publishing Company, Hartington, 1977. My article does not add anything to these researches, but merely comments on them from a Baptist point of view.

Previously published in *Transactions of the Baptist Historical Society,* Vol.II , p.118, are "Thomas Newcomen: Inventor and Baptist Minister, 1663-1729" by James Ford, and in *Baptist Quarterly*, Vol.XV, p.216, "An Original Letter of Thomas Newcomen" by Percy Russell. (This letter is preserved in Dartmouth Museum).

My previous article entitled "Thomas Newcomen and the environment of innovation" was published in *Industrial Archaeology*, Vol.13, No.4, Winter 1978.

A recent article on "The General Baptist Church, Netherton, Dudley" by C. S. Hall, published in the *Baptist Quarterly* (Vol.XXIX, No.7, July 1982), contains a reference to Newcomen's association with that church.

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