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CRABTREE THE ENGINEER
Peter Rowe
1980

With great joy I have discovered that Crabtree was no less an engineer than a poet. Although there are a few hitherto overlooked clues amongst the recorded researches of the Foundation's Scholars, my main discovery came about by sheer chance. You will all remember in your O-level physics textbooks reference to the Bramah press — not a Hindu newspaper but a kind of hydraulic lever, the principle that activates the brakes of modern motor vehicles. An oriental discovery, you may think, but it is named after its alleged inventor, Joseph Bramah. A curious name — the off-spring of a wayward missionary? Not a bit of it! Joseph Bramah was the son of a Yorkshire farmer.

It may not seem an unusual name in present-day Bradford but this man was born in April 1749, 5 years before Joseph Crabtree, at Stainborough near Barnsley in the West Riding, and it was curiosity about his improbable name that led me to exciting discoveries, for Bramah was christened Jerimiah Postlethwaite and it was through Joseph Crabtree that he subsequently adopted the more exotic name by which he is known to posterity.

The story begins in that balmy October of 1772 just after Joseph had gone up to Queen's. Oxford appeared an exciting and sophisticated city to the country youth from Chipping Sodbury, who, in spite of his visits to Bristol and his long adventurous voyage with Captain James Cook, was still little acquainted with the fashionable world. Oxford rather went to his head and we all know of the vigour and enthusiasm with which he neglected his studies and the diligence and perseverance with which he annoyed his tutor, the odious Jacob Jefferson.

Joseph early met and became enamoured of a bonny bookbinder's daughter, one Bessie Goodlay, but her parents were somewhat disapproving of this precocious 18-year-old poet so obviously intent on interesting their daughter in more than just metre and rhyme. One day in late October Joseph proposed a picnic with the sweet Bessie. The weather was fine and unusually warm that autumn and Crabtree hired a phaeton for a short drive into the country. They trotted west in happy mood, crossed the river at Eynsham, picnicked near Stanton Harcourt and thence on to Bablock Hythe to recross the river by ferry. Not 200 paces from the Chequers Inn and the ferry boat, disaster struck when the carriage leather brace broke and rendered further riding impossible. Here they were all of six miles from Oxford and Bessie's suspicious father, expected home within two hours. Not very hopeful of help in this remote spot, Joseph went in search of the innkeeper.

The innkeeper and his wife were in fact away at market in Oxford, leaving the inn and ferry in charge of the ferryman, ostler and general handyman, no other than Jerimiah Postlethwaite. Indeed, Jerimiah had only been in Bablock Hythe for two weeks, having hurriedly left Barnsley, where he had been apprenticed to a cabinet maker, a month earlier, pursued by an angry master and tearful daughter. He hadn't stopped moving until he fetched up near Oxford, feeling himself now reasonably safe from a shotgun wedding.

It had been a quiet day, there had been no callers and so Jerimiah decided to wash his one and only pair of breeches and dry them in the unseasonably warm sun. When he saw the agitated Crabtree approaching, he hastily flung a white horse-blanket around himself. Postlethwaite was dark and still bronzed from the summer and on first seeing him, Crabtree not unreasonably mistook him for an Indian, a mistake reinforced by Jerimiah's broad Yorkshire accent that was quite incomprehensible to Joseph.

Largely by sign language, Crabtree indicated his predicament and that remarkable handyman Postlethwaite in no time at all repaired the brace with ingenious improvisation, ferried all across the river and received a guinea from the grateful Crabtree. Joseph and Bessie trotted back across the water meadows to Oxford and home.

Our poet felt very pleased with himself after the successful accomplishment of his amorous adventure and at supper that evening described the incident to a fellow undergraduate. He told of the strange Hindu who had been so helpful and resourceful. 'He was surely an educated man in spite of his lack of English. I think he must be a high caste holy man on a pilgrimage to foreign lands. They call them Brahmans, you know. Yes, I am sure he was a Brahman.' Thus Postlethwaite became known at Queen’s as 'Joseph's Brahman' and there was much merriment when his true origins became known.

At least once during November Joseph revisited Bablock Hythe, for he spent a day fishing with Jerimiah, when he was further impressed by the Yorkshire youth's uncanny skill with his hands and his inventive use of

whatever was to hand. Before Christmas, Postlethwaite had moved to the Mitre Tavern in the High and a close friendship developed between him and the young undergraduate at nearby Queen's. He saw in Crabtree an influential and educated patron who might advance his fortunes, and thus began a fruitful and ambivalent association that was to continue for thirty years or more.

As we all know, Crabtree was sent down from Oxford on his 19th birthday and although his movements thereafter are not well known, he was certainly in London for some time and Postlethwaite followed him there. Later, in 1773, the two were living in Denmark Street, St. Giles, now in the shadow of Centre Point, where Joseph's Brahman had a small workshop and the imaginative Crabtree set about developing ideas that would make use of his friend's talents and support them both.

His first idea was for a beer pump. As an Oxford undergraduate, Crabtree had frequently been irritated by the long thirsty wait for the potboy to bring beer from the depths of the cool cellar. The concept of a pump came naturally to his rich fertile mind and his resourceful Brahman soon translated the idea into copper and brass. The machine that today draws your pint of real ale, gentlemen, that pump is the direct descendant of Crabtree's invention fully described in Patent No. 2196 dated 31st October 1773. Now, the inventor named in this patent is not Crabtree but Joseph Bramah, for the canny Yorkshireman, already aware of Crabtree's feckless nature and unbusinesslike manner, took the precaution of registering the patent in the name he had newly adopted, partly to conceal his broken apprenticeship in Yorkshire and partly from admiration of his inspired partner. There is no evidence that Bramah intended to deceive Crabtree, but he was well aware of the poet's weaknesses.

Beer pumps were made by the dozen by the industrious Bramah, who began to employ assistants, whilst Crabtree sold them — the pumps, that is. Some idea of our poet's unsatisfactory nature as a business partner comes from an incident in 1775. Crabtree had apparently collected several hundred pounds from the sale of beer pumps, many months' output from the Denmark Street workshops. Feeling rich with so much money in his pockets, he embarked on an orgy of luxurious living and spent the lot in a matter of days. There is a rueful letter from Crabtree to Bramah, who was pressing for money to pay his assistants and buy materials. 'The money I collected is all gone, my dear Bramah. Most of it I spent on women, on wine and on gambling. For the rest, I just wasted it.' Bramah realised that if their business was to succeed, he must protect it against the folly of his mercurial partner, and took good care to register everything in the name of Bramah, This, of course, explains why Crabtree's role as an inventor has been overlooked for so long.

Further inventive ideas poured from Crabtree's fertile mind throughout his long and fitful association with Bramah: the famous water closet patented on 21st January 1778 (No. 1177), 6,000 of which were to be made before the end of the century, an invention that adds significance to Professor Thomas's discovery that Crabtree introduced the words 'convenience' and 'loo' into the English language; the tumbler lock, forerunner of the present-day Yale, was registered on 23rd April 1784 (No. 1430), the lock spoken of by Sam Weller's father when warning his son of predatory women — '... if I was locked up in a fire-proof chest with a patent Brahmin, she'd find means to get at me, Sammy'; patents were taken out for a fire-engine pump, the famous hydraulic press, a wood-planing machine, a ship's-block-making machine, a paper-making machine and, significantly, a banknote-numbering machine for the Bank of England. In 1809, the year Crabtree was appointed Reader in Criminology at his old university, a patent was taken out for the fountain pen and so named in the description.

I could go on for some time listing these Crabtree inventions exploited by the diligent Bramah and registered in his name but I have surely described enough to make you realise how much our material society owes to this careless genius we honour tonight. Bramah never forgot his indebtedness to Crabtree. In Walker's well-known engraving 'Men of science living in 1808', Bramah appears with his back to the onlooker. This was because Bramah knew that the face should be Crabtree's (see page 319).

Whilst the industrious and steadfast Bramah was exploiting the brilliant ideas of his inventive partner, Crabtree, as we all know, was struggling to make his name as a poet and seems to have treated his association with Bramah as a trivial matter that occasionally provided him with money. It is almost as if he was ashamed of his interest in material things.

Brown has described how Crabtree, under the pseudonym Malcolm M'Greggor, published amongst other things, 'An heroic epistle to Sir William Chambers, Controller General of His Majesty's Works'. This so pleased Sir William that he gave the young poet a letter of introduction to the Inspector General of Commerce to Louis XVI, one Pierre Samuel du Pont, who lived in the village of Chevannes in the district of Nemours, some 45 miles north-east of Orléans. Naturally Crabtree visited the du Ponts and there met the two teenaged sons, Victor Marie and Eleuthère Irénée. The boys were intrigued by the romantic poet who would speak only English and

took the opportunity to learn the language from him. It was with the younger son that Crabtree formed a deep and lasting friendship. Prompted by his older friend (Crabtree was 17 years his senior) Eleuthère was apprenticed to Lavoisier, then Chief of the Government Powder Works at Essonne.

The du Ponts suffered many ups and downs (mainly downs) during those turbulent years in France towards the end of the 18th century and we all know what happened to Eleuthère's employer. Pierre Samuel lost his state appointments and influence and, for a period, helped by Crabtree, set up as a book publisher in Paris. Eleuthère managed the print works and even printed paper money for the Republic in 1793. It was this experience in helping his young friend that led Joseph to the Bank of England and to his later invention of the banknote-numbering machine.

By 1799 the du Ponts had had enough of the new France and decided to emigrate to America. They sailed from Le Havre on 2nd October 1799 and, of course, Crabtree went with them. The voyage on the ill-manned 'American Eagle' was a disaster. They met bad weather, the sailors got out of hand and looted the passengers' baggage, everyone was seasick and discouraged except, according to the historian Dutton, Joseph Crabtree who, I quote, 'paced the deck, joked at hardship and wrote poetry for everyone's amusement'. Eventually, after 91 days at sea, they made landfall at Newport, Rhode Island, on 1st January 1800, journeyed south and later that month lodged with Victor Marie near Philadelphia.

Some weeks later, when recovered from their ordeal, Joseph and Eleuthère were out hunting in the woods and, after some hours of sport, ran out of powder. They managed to buy some locally but Crabtree was scandalised by the poor quality and high price of this local product. It was that evening that Crabtree realised how the young du Pont should make his fortune in the New World. Gunpowder! Eleuthère's experience at Lavoisier's powder factory coupled with machinery devised by Crabtree and realised by Bramah would make a product in short supply and high demand in this pioneering new nation. The du Ponts were soon fired with Crabtree's enthusiasm. Negotiations began to acquire Broom Farm on the Brandywine River, where water power was readily available to drive the Crabtree mills and, in the spring of 1800, Crabtree returned to France to raise capital for this new and exciting adventure.

During the long return voyage, our very English poet began to have disturbing doubts. Could he really encourage the manufacture of gunpowder by truculent Americans who had already had the impudence to flout English authority? During that long voyage, he had ample time to wrestle with his conscience. Loyalty to a friend was almost as important as to his country, but before the ship made landfall, Crabtree knew where his duty lay. The poet, who only a few years later was to inspire the Grenadiers at Waterloo with his haunting phrase 'Great unaffected vampires and the moon', was first and foremost an Englishman.

As his ship dropped anchor off Le Havre, Crabtree quietly slipped across to an English packet and returned to his native land. No doubt it was this rather irregular disappearance that led to the false reports of his death in 1800. Crabtree, of course, wrote to Eleuthère to explain his defection and the du Ponts had to manage without further material help from the man who visualised and inspired their venture, but the strength of his initial impetus is all too apparent in that vast present-day American chemical company and explains why it is known today as E.I. du Pont de Nemours and not as Crabtree and du Pont, as would be more just and fitting.

Crabtree continued to correspond with Eleuthère throughout his life and we know of the letter first discovered by Professor Cadwallader written after his shipwreck in the Bay of Biscay in 1825 and beginning 'My Dear E'. Eleuthère, of course, for Crabtree could never spell that grotesque French name.

As my researches progressed and more was discovered of Joseph Crabtree's inventiveness as an engineer, I became increasingly aware of a strange and bewildering anomaly. Here was a man of supreme assurance and ability, and yet so much hitherto known about him points to someone wracked by self-doubt and tortured by insecurity. Could they be the same man?

There are some incidents in Joseph's young life that no doubt a psychologist would use to explain this inner insecurity. To be savaged by the great Dr. Johnson at the tender age of 9 must have left a deep scar on his poetic soul. His Methodist background, his early sexual experiences, the tragic death of his friend and hero, Captain Cook, on Crabtree's 25th birthday, and we must remember he was a Thursday's child: all this may explain much, but contrast it with the confident boy of 14 who undertook that long and hazardous voyage of exploration, the young man who travelled to argue with Linnaeus, the Crabtree that returned from France to Birmingham in 1791 to foment the mob against Priestley, the vigorous defender of Newton, the Crabtree that hounded Jenner, his long and bitter arguments with Humphry Davy, his hostility to Thomas Young, the young man who annoyed

Coulomb, the man who launched the du Ponts, the prolific inventor and the man who, in old age, just with a withering glare caused Wheatstone to flee the Royal Institution in terror. This is a man of supreme almost unreasonable confidence, cocksure — at least before Sir Lancelot got at him.

To set the events in contrast in this way at once reveals the pattern. As poet and artist, Crabtree was riddled with self-doubt and despair. As a scientist, engineer and inventor, he was assured, resolute and absolutely convinced of his ability and reason.

Much of this is illustrated by a little incident in 1806, when Crabtree was 52. Humphry Davy had been invited to give that famous first Bakerian Lecture on 20th November before the Royal Society. The President then was Sir Joseph Banks, who had sailed with Crabtree on Cook's first voyage of discovery and who invited his old friend and shipmate to hear his lecture 'On some chemical agencies of electricity'. This was the lecture in which Davy, with great insight, said that 'chemical and electrical attractions were produced by the same cause acting in the one case on particles and in the other on masses', a concept of great significance in the advance of scientific knowledge. Crabtree listened with growing hostility to his old antagonist until, at question-time, he leapt to his feet and demanded to know if Davy still believed in the inverse square law. When Davy agreed that he did, Crabtree shouted triumphantly, 'Then why in electrolysis do the results not depend on the distance between the electrodes?'. Davy recognised his adversary's lack of logic and explained the point in such a way as to make Crabtree look foolish. But that intrepid, convinced and unhesitating man of applied science and engineering stopped Davy in his tracks with the devastating 'I know you believe you understand what you think I said, but I am not sure you realise that what you heard was not what I meant'.

Crabtree lacked both the logic and the patience to be a great pure scientist but the poet in this complex character shines through with his flashes of insight and vivid imagination that, coupled with unshakeable confidence, led to the many inventions and practical ideas he so carelessly passed on to mankind. The creative vision he yearned to express in poetry appeared so effortlessly in his many inventions.