

## 2| Quaker Clockmakers

**By Tim Marshall**

### **Background**

For those living in early 17<sup>th</sup> Century England the rhythm of life for most people was still governed by the rising of and setting of the sun, the apparent motion of the sun regulated society; and the sundial was the only means of accurately measuring what is known as “local apparent time” or “apparent solar time”, by which the country ran. (“Apparent solar time” can be simply explained as the sun appearing to move across the sky to complete one circuit of 360 degrees every 24 hours, passing at a rate of one degree of longitude every four minutes, each place sharing the same longitude shares the same time).

Due to the slow means of communication it made no practical difference to the lives people led, that the time would be different further to the east or west. Horological technology had barely advanced from the invention (by an unknown scholar/craftsman) of the first mechanical timekeepers in the late 13<sup>th</sup> Century – weight driven turret clocks, controlled by a verge and foliot (or balance) escapement, which required frequent adjustment from a sundial to make the uneven hours of solar time audible by the chimes. Then in 15<sup>th</sup> Century Flanders or possibly Italy another unknown craftsman (probably inspired by Locksmiths work) had the idea of replacing the weight drive with a mainspring to provide the driving power, which resulted in the introductions of small portable drum clocks, the precursors of the watchmaking craft, which became established in France or Nuremburg by the early 16<sup>th</sup> Century – albeit that accurate mechanical timekeeping remained elusive.

However it was not until the mid-16<sup>th</sup> Century that the shortcomings of accurate timekeeping became a more serious matter for the scientific community, when in 1543 Copernicus published his revelation that the earth was not stationary at the centre of the universe, but rather it was the sun which stood motionless with the planets revolving around it; to be followed in 1609 with

Kepler's first two rules of planetary motion explaining the planets did not revolve around the sun in a circle but an ellipse, speeding up when they were nearer the sun. These discoveries led to an outpouring of new dialling literature and hence more sophisticated scientific sundials that were far in advance of the best contemporary mechanical timekeepers.

By the time George Fox was born in 1624, English domestic clockmaking was more in its first generation of native born and trained clockmakers, producing what was the first wholly English conceived mechanical timekeeper – the weight driven lantern clock, controlled by a verge and balance escapement. Hitherto clockmaking had been dominated by foreign craftsmen, either exporting their work from the continent or London based of often Huguenot descent (as refugees from intolerance). This output of clocks and watches was regarded as costly novelties or status symbols rather than reliable timekeepers.

Accurate timekeeping would have to wait until the 1650's for one of sciences monumental discoveries – the publication of Christiaan Huygens 'Horologium' in 1658 (from 1656) describing harnessing a pendulum as an independent oscillator, via a crutch to the escapement to control the motive power, (it is the pairing of a pendulum to a crutch which is the important point that is often overlooked) which exponentially increased accuracy. The new precision pendulum clocks could perform with such accuracy over a longer duration providing science and commerce with the accurate meantime they so desperately needed, in addition the equation of time became visible.

The idea was immediately taken up in England by one of the greatest clockmakers of all – Ahasuerus Fromanteel of London, the Anabaptist son of a Norwich wood turner that led to the pre-eminence of English clockmaking for the next 200 years. As clockmaking was making that giant leap forward, George Fox was building a Quaker organisational structure which would ensure it not only survived the early years of persecution, but thrived, especially suited to the tradesman/craftsman class – men of independent thought who had been drawn to the new Religious Society of Friends, by its common approach to religious and everyday life. Among them were clockmakers, who were implicitly literate and numerate, practical men who could contribute much to the new movement, but also take full advantage of any opportunities that might arise in an organisation that placed honesty and trust foremost.

The administrative structure George Fox conceived was to implement a network of meetings, based on a concentric model, with the yearly London meeting at the heart of the organisation to both instruct and offer guidance, radiating out via quarterly regional meetings to the monthly division of circuit meetings (dealing with fundamental issues of births, deaths and marriages) and

then to the regular preparative meetings at the local scale. Each one designed to ensure the core Quaker values entered all walks of their lives; and of relevance to clockmaking are these four elements of Education, Apprenticeship, Travel and Trade, each one having a direct impact on the future success of Quaker clockmakers.

Being both literate and numerate and in no small measure trustworthy, clockmakers were often the obvious candidates to represent monthly meetings at both the quarterly and London Yearly Meeting, in terms of travel, this provided the clockmakers not only with the opportunity to form spiritual and personal bonds as they travelled between the meetings, but had the effect of developing trade and business networks that, as we shall see later, spread across the country and then overseas to the American colonies.

As for trade, guidance was issued setting out an ethical code, which imbued their business activities with the core belief of honesty and truth in all matters, that both enhanced the reputation of the individual and the Religious Society of Friends. Quaker tradesmen should not financially overstretch themselves and take an unserviceable debt or enter a business they knew nothing of. Being denied access to the universities and hence a profession, it is not surprising that Quakers were drawn to the natural sciences and metal based technologies, among them clockmaking – producing consistently good quality products at a fair and fixed price (to bargain proved that a price demanded was untrue and hence at odds with the Quaker ethos of truth). As a result, their clocks were in demand, to the financial benefit of both the clockmaker himself and the general stock of the Religious Society of Friends.

Fox saw education as being crucial for the wellbeing and future of the Society, shunning the need for classical learning (what was the point of it if Quakers were barred from universities), instead concentrating on more practical subjects that trade and business required, in the case of clockmaking a sound knowledge of mathematics and applied mechanics was a natural choice for many. This manifested itself in craft apprenticeship within the compass of the Religious Society of Friends, which also had the effect of ensuring the youngsters attended meetings and were brought up in the Quaker way of life. The apprenticeships were sometimes paid for from Quaker funds or more often, especially in country districts it was an arrangement within and between groups of Friends – nowhere more successful than among the North Oxfordshire Quaker clockmakers of the 18<sup>th</sup> Century.

Although it was not until after the 1689 Act of Toleration for the full benefits of the application of core Quaker Beliefs through education, apprenticeships and travel and business, via the meeting structure to be fulfilled,

this context enabled Quaker clockmakers and tradesmen to enjoy economic power way above their numbers, lasted throughout the era of English clockmaking from 17<sup>th</sup> Century to the 19<sup>th</sup> Century.

### **First Generation Quaker Clockmakers**

For those first Quaker clockmakers the years leading up to the 1689 Act of Toleration were difficult and often dangerous, not only did they have to contend with an intolerant established Church (and therefore country), at first the Presbyterians of the Interregnum followed by the Episcopalians of the restoration, but also the effects of the plague and great fire of London devastating most of the city's clockmaking districts (just how many were Quakers is unknown). At the same time the Dutch sea wars and the profligate royal family coupled with the uncertainty of a protestant succession all contributed to an unsettled economic climate for trade still recovering from the effects of the civil war.

During the early years of the 1650's and the 1660's those established clockmakers that joined the new religious society were spread over a wide area from Bristol in the west, the midlands and of course London. Their main output, regardless of whether they were town or country clockmakers was the lantern clock (at first balance and then pendulum controlled).

Two of the most interesting Quaker clockmakers from this first generation worthy of comment for very different reasons are the relatively obscure John Roe of Epperstone in Nottinghamshire and the well-known London maker Hilkiah Bedford.

John Roe was born c.1637 and spent his long working life at Epperstone, a village four miles north east of Nottingham, a maker of lantern clocks and more interesting – turret clocks of a rare timber framed form found mostly in the midland counties, the earliest at Shelford was installed in 1680. The presence of this clock at this early date (pre- Toleration Act) is interesting, suggesting that in this part of Nottinghamshire, discrimination by the clergy had softened, to the extent that any prejudice against a Quaker clockmaker was outweighed by the quality and value of his work. John Roe was a leading member of his local meeting, becoming a trustee for the Oxton Meeting House in 1699; he died in 1720 and was buried in the Oxton Quaker burial ground.

Hilkiah Bedford of London is a rare example of a mathematical instrument maker and clockmaker, combining both aspects of time measurement. More well known today for his instruments and dials, his output included universal ring dials, quadrants and sundials. Born in 1632 at Sibsey, Lincolnshire, he was the son of Thomas Bedford an early Quaker convert, and was apprenticed through

the Stationers Company to John Thompson a mathematical instrument maker in 1646, freed in 1654 and in 1667 became a free brother in the Clockmakers Company despite refusing to take the oath. His clocks date from after his admission into the Clockmakers Company: they included lantern clocks, spring (or bracket) clocks and one early longcase is known – an anchor escapement long pendulum example dating from the early 1670's made just after the invention of the anchor escapement (attributed to Joseph Knibb of Oxford c1670). Its introduction was an important milestone towards precision timekeeping, more accurate and simpler to make than the verge and crownwheel, which it replaced as the standard of pendulum control in longcase clocks thereafter. Whether any of Bedford's clocks were made by his own hand or a journeyman is unclear, certainly a division of labour at a craft level already existed at that time among members of the London trade and was widely used – brass foundries supplied the lantern clock frames, wheel blanks, dials and decorative castings, and of course the specialist engravers, bell founders and cabinet makers and joiners for the cases. It seems likely that Bedford's membership of the Religious Society of Friends was confined to his early years, certainly before his son Hilkiah Bedford was admitted to St. John's College Cambridge in 1679. Hilkiah Bedford died in 1689, the year of the Act of Toleration and was buried in St. Dunstan's Fleet Street.

### **London**

After the accession of William and Mary in 1688, continental influence or furnishing design began to make an impact upon London taste, resulting in some clock cases becoming very grand, albeit in a more elegant manner, greatly influenced by the French designer Daniel Marot. These clocks were for the very wealthy only and among the most eminent of London Clockmakers operating in this exclusive market was the Quaker Daniel Quare.

Born in Somerset in 1647 Quare was admitted into the Clockmakers Company as a great (turret) clockmaker, albeit he did not swear an oath. Initially he worked in St Martins Le Grand, moving to Allhallows, Lombard Street by 1681 and then finally at the sign of the Kings Arms in Exchange Alley by the mid 1680's. From each of these premises he produced watches, spring (bracket) and longcase clocks and barometers of the highest quality for the most affluent customers, including royalty and foreign dignitaries; his Quaker lifestyle presented no handicap.

During his illustrious career he took a total of 15 apprentices including his eventual business partner and successor Stephen Horseman. Among his technical achievements was to develop one of the first repeating watches; he

patented a “night engine” (presumably some type of early burglar alarm driven by clockwork) and patented his invention for a portable barometer in 1695. Quare’s patent was for a barometer that could be inverted without spilling mercury, probably achieved by simply pinching the top of the tube and shrouding the cistern containing the reservoir of mercury in a leather bag. These barometers were generally of the highest quality, much sought after by the wealthy of those days as they are now, just as popular in France and Germany where the scales (often silver) were engraved in English on one side and French or German on the reverse.

However, it is Quare’s long duration clocks which place him among the best of English clockmakers, including a year duration equation of time longcase. So highly was he regarded that despite not taking an oath he became the Master of Clockmakers Company in 1708, and when George 1<sup>st</sup> ascended the throne he was offered the position of clockmaker to the King; once again the question of not swearing an oath was overcome and he was allowed access to the Sovereign by a back entry. Quare is quoted as saying “The Yeoman of the Guard, lets me frequently go up without calling anybody for leave, as otherwise he would tho persons of quality”.

Over a long career, he made a prolific number of clocks; He died on 21 March 1724 and was buried in the Quaker burial ground at Bunhill Fields. The Daily Post of 26 March 1724 reported “Last week dy’d Mr. Daniel Quare, watchmaker in Exchange Alley, who was famous both here and at foreign courts for the great improvements he made in that art, and we hear he is succeeded in his shop and trade by his partner Mr. Horseman. His daughter, Ann, married in 1705, when many European nobles attended”.

Towards the end of this “golden” period of London elegance another eminent clockmaker with Quaker origins rose to prominence – George Graham. No account of Quaker clockmakers would be complete without reference to a maker brought up as a Quaker by his family in Cumberland who went on to become one of the greatest clock and watch makers of the 18<sup>th</sup> Century. George Graham was born in 1673 in Kirkclinton parish, Cumberland, the son of a farmer who became a Quaker after his son’s birth. He was bound apprentice to Henry Aske of London in 1688, then worked for the most famous clock maker of all – Thomas Tompion, whose niece he married in 1704, then entering into partnership with Tompion in 1711 before taking over the business (at the Dial and Three Crowns) upon his former master’s death in 1713.

George Graham became a Warden and then Master of Clockmakers Company in 1722. He was a fellow of the Royal Society and is credited with several important inventions – the deadbeat escapement in 1715 and the mercury

compensated pendulum, the combination of both was essential to precision clockmaking, remaining in use until the late 19<sup>th</sup> century. He perfected the cylinder escapement, a type of deadbeat escapement not subject to change in driving power, which became widely used by French and Swiss watchmakers until into the 20<sup>th</sup> century, although never as popular with English watchmakers. His workshop produced a prodigious number of high quality watches (said to be around 3,000), spring and longcase clocks and a few humble travelling alarums and most important – precision regulator clocks.

George Graham was also an important scientific instrument maker. His output included an eight-foot quadrant for the Astronomer Royal Edmund Halley in 1725, planetary models, a twenty-two-and-a-half-foot zenith sector and transit instruments; including instruments for the Maupertuis expedition to Lapland in 1736 to prove Newton and Huygens theories that the earth flattened at the poles. It was to the trustworthy ‘Honest’ George Graham that John Harrison turned to on arrival in London to pursue his quest to build a precision marine timekeeper for finding longitude at sea, providing Harrison with an unsecured interest-free loan.

George Graham died in 1751, one of horology’s greatest inventors and is buried in Westminster Abbey. Although in terms of his active participation in Quaker life, there is no evidence that he was a member of the Royal Society of Friends after moving to London to take up his apprenticeship.

### **1689 to the beginning of the 18<sup>th</sup> Century**

Following the 1688 departure of James the second (a Roman Catholic sympathetic to the Quaker cause in terms of religious toleration), William and Mary quickly granted full liberty of conscience to all religious dissenters, enshrined in the 1689 Act of Toleration – pragmatists, William realised this was necessary for stable government and for an economy to thrive. The Yearly Meeting of 1689 responded by issuing a note of advice which was to set the tone for the next 150 years or so, encouraging Friends to give “no offence nor occasions to those in outward government no way to any controversies, heats or distractions of the world” – sound advice for business and Quaker clockmakers, although with certain drawbacks for a religious movement which hitherto had been at the forefront of challenging the religious establishment; Quakerism never again had the evangelical zeal to reach out to new members (including clockmakers) on the same scale. However, the more inward looking organisation appeared to suit the Quaker clockmakers who could settle down to their work confident that the disturbances of the past 40 years were behind them. The Act of Toleration enabled the Quakers to make the most of the growth and spread

of domestic clockmaking from what had until then, been mostly centred in London and a few regional cities Bristol, Oxford, Salisbury, Norwich, Newcastle and York being among the most prominent, was now moving into the market towns and beyond. Quaker clockmakers were setting up in business over a wider geographical area.

In the west country, Abel Cottey of Crediton and Arthur Davis of Westleigh were both in business during the 1680's making lantern clocks (Davies also made much rarer posted movement musical clocks). Cottey is famous for becoming Philadelphia's first clockmaker, after sailing with William Penn aboard the 'Welcome' in 1682. (He returned to Devon in 1695 before finally emigrating again in 1700, leaving behind some uncharacteristic debts). In the south of England, the Howe family of Dorchester in Dorset were producing quite distinctive thirty-hour longcase clocks, with substantial brass plate movements behind simple embellished dials for a country market far removed from the refinements of London fashion. In contrast, Jeremy Spurgin, Colchester's early Quaker clockmaker was understandably more influenced by London styles, as well as lantern clocks he is known for some very elegant marquetry cased eight day clocks at the height of London fashion. Spurgin is also an interesting example of a late 17<sup>th</sup> century Quaker clockmaker who was permitted to trade in the town upon payment of a fine (£10) in 1697, and was sufficiently established in Colchester to attend vestry meetings to fix the parish rate. He died in 1699 aged just 33 and was buried in the local Quaker burial ground.

In Staffordshire, an important Quaker clockmaking dynasty was being established by three brothers – Samuel, John and Peter Stretch, a name that would resonate in clockmaking circles halfway across the world; from Leek via Wolverhampton, Birmingham and Bristol to Philadelphia, celebrated today as America's first family of clockmakers after Peter Stretch emigrated in 1703. They came from Harpers Gate just outside Leek, Samuel the eldest brother had established his clockmaking business in Leek by 1681, taking younger brother Peter as his apprentice c.1684, eventually handing over the workshop to Peter when he moved away to Wolverhampton c.1697; John, the least well known established his business in Bristol, where he was eventually joined by Samuel c.1714. All three are known today for their lantern and longcase clocks, one such lantern clock made by Samuel c.1685 still retains its original balance control, highlighting the continued demand in some country areas for a basic short duration clock (about 12 hours) some 30 years after the introduction of the pendulum.

## **The North West of England Quaker Clockmaking Tradition**

One of English clockmaking's unique regional styles exclusive to a network of Quaker clockmakers working in some of the remotest parts of the north west of England can be traced back to John Ogden of Bowbridge Hall near Askrigg in Wensleydale during the 1680's. Ogden, a prominent member of the local Meeting and trustees of the Meeting House, pioneered a distinctive form of thirty hour duration clock comprising a large brass posted lantern style movement, the dial engraved with religious or morbid verses, a particular favourite being "Behold this hand, Observe the motion's tip, Man's previous hours, Away like these do slip", or a more simple "Momento Mori" – In this remote place. John Ogden is thought to have trained his two sons John Jnr and Bernard (after they moved to Newcastle then Alnwick and finally Sunderland while Bernard remained at home) as well as five other apprentices – John Ismay, Isaac Hadwen, Robert Brownless, John Sanderson and Mark Metcalfe. The first four of his apprentices continued Ogdens style into the first half of the 18<sup>th</sup> century, though oddly neither John Ogden himself or either of his sons did, after her moved off to Darlington in 1711, preferring instead to conform to the styles favoured there (although there remains the possibility that Ogden had moved beyond the compass of an unknown engraver responsible for the verse dials). They certainly remained popular with Ismay and Sanderson at Wigton, Brownless at Staindrop and Isaac Hadwen during his time at Sedbergh. Of the four John Sanderson was the most prolific and idiosyncratic in the nature of his work, each clock different from the next, within the distinctive regional style.

Unlike Sanderson who may well have left Quakerism, Isaac Hadwen remained within the Society of Friends throughout his life, embodying those key principles of education, apprenticeship, travel and trade, which encompassed a wide network. He was born at Burton in Kendal, Westmorland in 1687, (his stepsister was married to the Clifton clockmaker – Thomas Savage) and apprentice to John Ogden c.1701 before beginning work at Sedbergh c.1710. He married Sarah, the daughter of a prosperous local Quaker Dr John Moore of Eldroth Hall, enabling him to quickly establish a thriving business, moving to Kendal in 1722 and then Tunstall in Lancashire. His success as a clockmaker allowed him to travel widely on Quaker business, including two trips to America, the first in 1718 and then again in 1737 where he died of fever at Chester, Delaware. The family business now removed to Liverpool under the stewardship of his widow Sarah until Joseph Jnr. was able to take over, continued to produce good quality longcases, and more importantly sold clocks wholesale to other clockmakers as far away as John Fry the famous Quaker in Wiltshire, who in turn traded with the Gilkes family from North Oxfordshire, thus forming a common

link between the two quite distinctive Quaker clockmaking traditions of the 18<sup>th</sup> century.

### **The North Oxfordshire Quaker Clockmaking Tradition**

The early years of the 18<sup>th</sup> century saw the emergence of a group of Quaker blacksmiths cum clockmakers in rural North Oxfordshire, namely the Gilkes and Fardon families, who, along with their descendants, relatives and apprentices built a network of Quaker clockmakers who dominated the craft in this area throughout the 18<sup>th</sup> century and into the 19<sup>th</sup> century, virtually to the end of English clockmaking. The network diagram (figure one) illustrates the relationship between master and apprentice together with the interaction between Monthly Meetings, which proved so successful for so long.

Founded by Thomas Gilkes Snr. of Sibford Gower, they produced one of the most instantly recognisable styles of English country clockmaking – the 30 hour duration iron posted hoop and spike clock with distinctive ring & zig-zag engraved dials, either for hanging directly on the wall or off a hook located on the backboard of a longcase. Inexpensive – costing somewhere between £2-10s to £4 depending upon whether they were single or two handed, had a calendar or were cased, they found a ready market in a local rural population gradually becoming more prosperous, albeit still beyond the pocket of the labouring and servant classes. The clocks themselves are unique to the North Oxfordshire Quaker tradition, made for the most part in the village clockmakers workshops, forging the iron frames and movement ironwork, engraving the ring & zig-zag pattern dials themselves with only the basic of tools – a graver and compass, casting their own brass spandrels often from a poorly defined mould and repeated many times over. In short they reduced their production costs by making what they could themselves, rather than buying in components; using much cheaper iron instead of the more expensive brass where possible.

First produced by Thomas Gilkes snr. of Sibford in the early years of the 18<sup>th</sup> century, their production extended through three generations of Quaker clockmakers, some being signed by the Quaker clockmaker and others left unsigned (probably for the wholesale market) ending with the late 18<sup>th</sup> century examples of John Wells of Shipston or William Green of Milton under Wychwood – they hardly changed at all. During this time, the North Oxfordshire Quaker clockmakers played important roles in each of the Meetings in Banbury and Witney divisions, attending the local and travelling to the Regional and Yearly Meeting, thus extending their business networks even further.

## **The English Midlands**

Elsewhere in the country, Quaker clockmakers were producing work more in line with general styles of the period. In Nottinghamshire one notable maker was Joseph Kirk of Skegby and then Nottingham, he was born at Hardstoft in neighbouring Derbyshire, where his earliest clocks are signed. A maker of good quality 30 hour and 8 day longcases he was succeeded in the clockmaking business by his daughter Ann who upon her marriage to a non-Quaker in 1738 was disowned by Nottingham Monthly Meeting – a not unfamiliar story as the century progressed.

In Derbyshire during the late 17<sup>th</sup> century and early 18<sup>th</sup> century the Tantum family - Francis, Jonathon and Daniel (all brought up as Quakers) were highly regarded for their longcase clocks, Francis Tantum of Loscoe made some interesting 8-day clocks incorporating a passing strike. They are also notable for two of their apprentices – James Wooley from Codnor (bound to Francis) and William Barnard of Newark (bound to Daniel) who both went on to become well known regional clockmakers. However, it seems unlikely that any of the Tantums remained within the Society of Friends after marrying out.

Further South at Kettering in Northamptonshire we come across a most ingenious man working during the first half of the 18<sup>th</sup> century – Thomas Eayre who combined clockmaking with bell founding, casting a ring of bells for St Botolphs, Boston (the famous ‘stump’) he was also a chimes maker and a surveyor & cartographer who made his own waywiser. His son Joseph Eayre was brought up as a Quaker, and trained by Thomas to become a notable provincial clockmaker at St. Neots, is well known for his equation of time clocks and his friendship with the antiquary William Stukeley.

## **The Industrial Revolution**

While several families of Quaker Clockmakers were established in the North of England during the 18<sup>th</sup> Century – some like the Greaves family on the Quayside at Newcastle from the 1730's (perhaps more notable for buying their engraved dials from Beilby and Bewick during the 1770's) and at York the Storr's and Terry's (a name more associated later with the city's confectionary manufacturing) - they all continued to supply their traditional client base. Others, and it is not clear just who and how many, became involved in the mechanisation process for the new manufacturing mills being established in Yorkshire and Lancashire; bear in mind that clockmakers (Quaker and otherwise) were just about the only people with an understanding of practical applied mechanics, capable of cutting wheels and making running gear for the new manufacturers, during the early pioneering days. What we do know is that the Hargreaves family

of Settle certainly provided timekeepers for the new mills – Langcliffe Cotton Mill in 1785 is one example.

However, it is the son of German immigrants living in Epworth in Lincolnshire who made one of the most significant technological discoveries of the 18<sup>th</sup> century. Benjamin Huntsman, a Quaker clockmaker working in Doncaster during the 1740's, invented the crucible steel manufacturing process that made Sheffield steel world famous. After moving to Sheffield he left the clockmaking craft to capitalise on his new invention, setting up in business as a Sheffield steelmaker in 1751 - that company name survives to this day.

Another example of a Quaker clockmaker with an entrepreneurial spirit taking to manufacturing, albeit in the wrong place was Joseph Oxley of Fakenham, another Lincolnshire born clockmaker, who set up in business manufacturing worsted in Norwich during the 1750's, some distance from the more centralised urban industrialisation about to take place in the West Riding of Yorkshire. Two Manchester Quaker clockmakers with interests in the latest scientific ideas of the day, more often associated with the Lunar Society were father and son – Peter Clare Snr. and Jnr. Peter Clare Snr. came from Hatton, Cheshire where he was a member of the Local Meeting before moving to Deansgate in Manchester, was a clockmaker, inventor and lecturer. He made high quality longcase clocks, turret clocks and smoke jacks, for which he obtained the King's Royal Patent, and gave public lectures about: electricity and lightening, pneumatics and mechanics. He was remembered in a poem published in the Palatine Notebook of 1884, almost 100 years after his death –

“There is the cottage of Peter  
That cunning old fox  
who kept the sun right  
by the time of his clocks”

He died in 1799, the local Manchester press reported, “...one of the Society of Quakers, a man of intrinsic merit as a mechanic and philosopher.”

His son Peter Jnr. was equally famous; as well as producing high quality longcases including musical clocks and regulators, he was a wholesaler of movements to other clockmakers and made watchman's clocks for use in the mills around Manchester and house bell systems for his wealthier clients. Peter was a close friend and executor of Dr. John Dalton - an eye witness describes them out walking.

“at a slow pace owing to the Doctor's feebleness...Peter Clare was always remarkably neat and well dressed in a suit of black, wearing knee breeches

with silver buckles, which showed his fine, well shaped legs, and a broad brimmed hat. His linen was of the purest white, and he presented a clean, happy and cheerful looking face.”

Peter was an eminent member of Manchester’s scientific community, becoming the secretary of the Literary and Philosophical Society in 1821, Fellow of the Astronomical Society and honorary member of Manchester’s Portico Library. He died in 1851 and is buried in the Quaker burial ground at the Mount Street Quaker Meeting House.

### **Precision Clockmaking**

While the majority of Quaker clockmakers were concerned with producing reliable timekeepers for their local domestic customers, in terms of precision timekeeping, two London clock/watchmakers stand out. Both were brought up as Quakers in rural England – the first of course was George Graham, whose deadbeat escapement and mercury compensated pendulum set the standard in precision clocks for the next 100 years or so. The second was the man who spent his early years as a watchmaker employed by Graham making escapements, before setting up in business on his own account – Larcum Kendall, the Charlbury born watchmaker, whose workmanship and skill was unsurpassed in his day. Kendall was apprenticed to John Jeffreys in 1735, a highly regarded London watchmaker who produced work for John Harrison of longitude fame - from the outset Kendall was associated with the best precision clock and watchmakers of the day, so much so that in 1765 he was among those named by the Board of Longitude to whom John Harrison was obliged to reveal this method of construction of his fourth marine timekeeper (H4) - it was Kendall who was entrusted to make an exact copy of H4 in 1766 to accompany Captain James Cook on his voyage to the South Seas in 1772. Kendall’s timekeeper known as K1 cost £450 and performed impeccably, enabling Cook to chart New Zealand and the east coast of Australia with such accuracy and detail was far more efficient than the alternative lunar observation method. Kendall went on to make two other marine chronometers (as they became known) of historical importance - K2 costing £200 (which accompanied Captain Bly on the *Bounty* in 1772) and K3 in 1774 costing £100 (crucially due to Kendall omitting the remontoire to reduce cost) which sailed on Cook’s fateful 1776 expedition to the North Pacific. While both timekeepers performed exceedingly well during their service, neither could match K1, they were cheaper simplified versions of his great masterpiece (the copy of Harrison’s H4) but no improvement – Kendall was a great watchmaker craftsman but not an innovator.

When he died in 1790 his obituary in “The Gentleman’s Magazine” tells us that although Kendall left the Quakers and never dressed in their manner, “they received his body into the bosom of their church, at his death”. It also includes this tribute to K1 – “that as a piece of workmanship, whether we consider the truth of handling or exquisite finishing of it, it has never been equalled, and perhaps never may”. Today K1 can be seen at the National Maritime Museum at Greenwich where it is exhibited alongside Harrison’s H4 timekeeper as one of nation’s great treasures.

### **America**

With the arrival of Abel Cottey in Philadelphia, initially in 1682 and then permanently in 1700, followed closely by Peter Stretch from Leek in Staffordshire in 1703, Quaker clockmaking in America became established. Both men were from country clockmaking backgrounds in England and quickly settled down to produce thirty hour and eight-day duration longcase clocks in their familiar English regional styles. Cottey, the older of the two men died in 1711, while Peter Stretch went on to found one of America’s most famous (and first) family of clockmakers, gradually evolving a style for the new colonial market quite distinct from English clocks of the period, suggesting that he began sourcing his materials (certainly engraved dials) from local suppliers from quite an early stage – brass foundries had already been established in the colony. Having said that, there was still a strong tendency for some clockmakers to continue importing their materials from England (much to the chagrin of the Clockmakers Company who opposed the export of component parts, as opposed to finished clocks). Although the biggest difference between the early colonial longcase clocks and their English counterparts were the cases, Stretch’s principal casemaker was a fellow Quaker emigre from England – John Head from Mildenhall in Suffolk, who supplied him with 42 tall cases between 1722 and 1742, typically costing between three or four pounds.

There was certainly a strong demand for Peter Stretch’s clocks. Philadelphia by the beginning of the 18<sup>th</sup> century was rapidly developing into a great centre of regional trade with a well-established civic community. This community aspired to a prosperous colonial life, and were eager to furnish their new elegant town houses with the latest luxury goods of the day, which Peter Stretch could provide, selling his clocks to the merchant classes, politicians and prominent citizens. He became a member of the Common Council of Philadelphia in 1708, and was entrusted to make the precious metal weights and scales for the town’s tradesmen, so essential in a city of immigrants using all manner of silver coinage in their daily transactions. He trained his three sons William, Thomas and Daniel

and his grandson Isaac as clockmakers, and their output ranged from the early 30 hour and 8 day clocks of Peter to the later more complicated musical clocks of William.

Peter Stretch died in 1746, having become a wealthy man, investing his profits in property and land in Philadelphia. His address on the south-west corner of Second and Chestnut Streets became known as Stretch's corner. He was buried in the Friend's burial ground at 4<sup>th</sup> and Arch Streets.

While the Stretch family were prospering in Philadelphia, another Quaker family of clockmakers, the Chandlee's were thriving in Maryland. Benjamin Chandlee Sr., born in 1685, came from County Kildare in Ireland and was apprentice to Abel Cottey in Philadelphia, marrying his master's daughter Sarah in 1710. He trained his son Benjamin Jnr, before moving to Wilmington in 1741. Benjamin Jnr. set up his clockmaking business in Nottingham, Maryland, then each of his three sons – Ellis, Isaac and Goldsmith continued the family tradition into the 19<sup>th</sup> century.

At Burlington New Jersey, a predominantly Quaker run township during the 18<sup>th</sup> century, several generations of the Hollinshead family were clockmakers. They were Quakers until Joseph Hollinshead Sr. (a second-generation clockmaker) was disowned for 'marrying out', however it appears they remained close to the ideals they had been brought up in. It was Joseph Hollinshead Jnr. who is remembered today for training America's first African American clockmaker – Peter Hill of Burlington, born in 1767 the son of one of the slaves working on the Hollinshead family estate. Peter Hill was apprenticed to Joseph Hollinshead Jnr. aged 14, then employed as a paid journeyman, eventually being freed from slavery c1794. Peter Hill set up in business on his own account around this date in premises almost opposite the Friends Meeting House in Burlington, marrying Tina Lewis in 1795 (the Acting Committee of the New Jersey Abolition Society reported Peter Hill could accomplish his own purchase and that of his wife). They moved to nearby Mount Holly, another Quaker settlement in 1814 and was buried in the Quaker burial ground at Burlington. At a time when it was not easy for an African American to be an independent trader, (despite the help he received among the Quaker community) Peter Hill was well regarded as a clockmaker and built a successful business, today one of his 8 day tallcase clocks is part of the Smithsonian collection.

In contrast to the 8 day and 30-hour duration tallcases that formed the "stock in trade" output of most clockmakers during the 18<sup>th</sup> century, a Quaker clockmaker from Buckingham, Bucks County, Pennsylvania was working at a much greater level of complexity. Joseph Ellicott, of Devonshire stock like Abel Cottey became one of America's greatest clockmakers. Born in 1732 he was a

mathematical and mechanical genius, who as a young man showed his early exceptional promise as a designer of mill machinery in Pennsylvania and Maryland. His great masterpiece (no.32 of his output) is one of the most complex year- going astronomical clocks ever made. It is a four-dial clock showing the usual seconds, minutes, hours and date - it also displays the phases of the moon, the year, high tide, and there is a musical carrillion, an automaton and an orrery. He trained his son Andrew Ellicott as a clockmaker, and Andrew eventually turned to surveying, becoming the Surveyor General of the United States in 1792.

No account of American Quaker clockmaking could ignore the cross Atlantic trade with the mother country – the most eminent London clockmaker who engaged in this trade was Thomas Wagstaffe, a Quaker originating from North Oxfordshire, working in Gracechurch Street. His reputation for first class work and his location close to the London Yearly Meeting ensured good business with visiting American Quakers attending the Yearly Meeting during the second half of the 18<sup>th</sup> century; irrespective of the War of Independence, many dissenters and men of science & industry sympathised with the colonists rather than the English establishment, in some respects it was ‘business as usual’. Wagstaffe’s standing among his American customers certainly transcended the war, not only supplying clocks and watches but also tools, weights and scales, plate and jewellery; he was highly regarded and a good friend to the Pennsylvania Quakers, presenting a large gallery wall clock to the Pennsylvania Hospital in 1764 which is still reliably ticking away today. Thomas Wagstaffe is also well known for his book ‘Piety Promoted’, an account of the lives of some notable early Quakers published in the 1750’s. He retired to Stockwell in Surrey and then finally to his native North Oxfordshire in 1802 where he died.

### **The 19<sup>th</sup> Century**

As the 18<sup>th</sup> century entered its last quarter it seems clear that unlike a century earlier, dissenting men of mechanical nature were being drawn to other forms of Protestantism outside the established church, particularly Methodism. While Wesley (though still a vicar in the Church of England) was preaching, and drawing crowds across England, Quakerism appeared inward looking and retrospective, lacking the evangelical zeal of the 17<sup>th</sup> century pioneers in sharp contrast to Wesley and his followers. This state of affairs did not go unnoticed by the London Quaker clockmaker Thomas Wagstaffe who wrote to the North Oxfordshire circuit Meetings warning of the dangers of Quaker religious ‘drowsiness’ and languor, this combined with the strict application of disownment for ‘marrying out’ had a distinct negative effect.

Nevertheless, here at least, the Quaker clockmaking tradition and network remained robust until the end of provincial clockmaking in England. Like so many other clockmakers in the 19<sup>th</sup> century they had to adapt to competition from cheap foreign imports. Reliable and far less costly clocks and watches from the USA and Europe forced many English clockmakers to diversify – from makers to retailers and purveyors of jewellery and plate. The Wells family from Shipston on Stour and especially the Simms family from Chipping Norton are good examples of Quaker clockmakers coping with change. From the 1770's they had been used to buying in ready painted dials from the dial manufacturers in Birmingham for fixing to their own movements. (Cast iron painted dials were first produced by the firm of Osborn and Wilson in 1770, were seen as a great advantage over brass faces, often subject to tarnishing, the clear white dials - one of the first products of the industrial revolution to affect clockmaking had more or less replaced the brass face by the 1780's). By the early 1830's and 1840's their stock would have comprised of mercury barometers, pocket watches, fusee wall clocks and longcases (still popular among rural population) and silver jewellery mostly from the larger manufacturing bases of London and Birmingham until by the second half of the 19<sup>th</sup> century the majority of their stock of clocks would be foreign imports.

It was much the same story in that other distinctive centre of Quaker clockmaking in the north west of England, although by now there was just one Quaker family clockmaking business left – the Simpsons of Wigton. Here by the 1840's, they too had diversified somewhat more dramatically, the last two brothers Stephen and Isaac Simpson were both engaged in manufacturing machinery - Stephen made gas meters at Mansfield in Nottinghamshire and Isaac patented a machine to make gold thread.

Elsewhere the story was much the same, as the clockmaking craft shrank, so did the Quaker involvement. Among the dwindling number of clockmakers (as opposed to watchmakers, retailers and repairers) there remained a small number of highly skilled craftsmen, mostly based in London and few other major centres, who were engaged in making high quality precision spring clocks for a discerning customer base. The Pace family, Quakers from London and Bury St Edmunds fit into this select group in the person of John Pace of Bury St Edmunds in Suffolk, clerk of the Bury Monthly Meeting from 1827 to 1832. He was a noted skeleton clockmaker who made a number of exhibition quality timepieces including a three-year duration skeleton clock that he exhibited at the Great Exhibition of 1851, but this was very much the exception rather than the rule, by the 1870's or so the craft of an individual clockmaker actually making a clock from scratch had all but gone.

Over a period of 200 years, when English clockmaking was pre-eminent and thousands of clockmakers plied their craft up and down the country, the Quakers could probably be counted in their hundreds, had an impact far outweighed their numbers.

The appendix lists some, but by no means all, Quaker clockmakers.

### Appendix

Joseph Atkins	Chipping Norton	Late 18 <sup>th</sup> century early 19 <sup>th</sup> century son of William Atkins. Member of Chipping Norton Preparative Meeting.
William Atkins	Chipping Norton	18 <sup>th</sup> century. Born at Brailes. Trained in London. Moved to Chipping Norton. A member of the Chipping Norton Preparative Meeting. Apprentices: His son Joseph Atkins & Richard Coles of Buckingham.
Thomas Bagley	London	Mid 17 <sup>th</sup> century lantern clock maker. Appeared before Surrey Quarter Session on 27 July 1662 for “unlawfully departing from their several habitations and assembling themselves together under pretence of journey in a regular workshop”, and later required to appear and “answer for a Quaker”.
Benjamin Bagnall Snr.	Boston USA	From Staffordshire, arrived in Boston C.1772. Died 1773.
Benjamin Bagnall jnr.	Boston USA	son of Benjamin Bagnall Snr.
John Bagnall	West Bromwich then Walsall	Late 18 <sup>th</sup> century
Samuel Bagnall 3	Boston USA	son of Benjamin Bagnall jnr.
Thomas Baker	Blandford, Dorset	Late 17 <sup>th</sup> century early 18 <sup>th</sup> century. Represented Purbeck Quaker Meeting between 1680-1715. 8-day longcase known.

Hilkiah Bedford	London	Born 1632 at Sibsey Lincolnshire. Apprentice to John Thompson London mathematical instrument maker. Became a free brother of the Clockmakers Company in Feb 1667. Longcase, spring and lantern clocks (one signed Hilkiah Bedford in Fleete Streete”). Died May 1689.
Thomas Bevan	Marlborough	Early 18 <sup>th</sup> century from London. Member of Westminster M.M.
Isaac Bispham	unknown	Trained by Isaac Hadwen Snr. in 1727. Married Hadwen’s daughter Eleanor
James Blancher	Attleborough, Norfolk	Born 1724. Married a Quaker. Died 1793. Obituary refers to letters in the Royal Society’s Philosophical Transactions.
James Bolt	London	Early 18 <sup>th</sup> century
William Bower	Chesterfield	Early 19 <sup>th</sup> century
John Bradshaw	Manchester	Born 1765. Worked in Common Street then Deansgate. Friend of Dr. John Dalton. Died 1832.
William Brewer	Philadelphia	Early 19 <sup>th</sup> century listed as residing at Friends Alms House
Robert Brownless	Staindrop	c.1710. Probably app, to John Ogden of Askrigg Early clocks with religious or morbid verse dials.
Ezekiel Bullock	Lurgan Co. Armagh	b.1650 working 1680’s-1714. Lantern and Longcase clocks.
George Canby	Selby	b.c.1634. London trained. Lantern clocks known.
Daniel Catlin Snr	Kings Lynn	Early 18 <sup>th</sup> century from Godmanchester Huntingdonshire. Maker of good quality longcase and bracket clocks. Founder of family clock and watchmaking business in King’s from 17 <sup>th</sup> century to 20 <sup>th</sup> century.
Daniel Catlin 2	Kings Lyn	Son of Daniel Catlin Snr. b.1738 d.1812
Daniel Catlin 3	Kings Lyn	Late 18 <sup>th</sup> century. Son of Daniel Catlin 2. B.1771 d.1818 (thought to have been a Quaker).
Elizabeth Caitlin	Kings Lyn	Late 18 <sup>th</sup> century. Sister to Daniel Catlin 3. B1783. m. John Burlington 1819.

Jonathan Chambers	Shefford	Probably London trained, working in Shefford by 1665. Maker of Lantern and longcase clocks. Died 1693 and buried in the Quakers burial ground on his property.
Benjamin Chandlee Snr.	Philadelphia	b.1685 Kilmore, Co. Kildare. Ireland. app. To Abel Cottey in Philadelphia. m.Sarah Cottey (Abel's daughter) in 1710. Moved to Wilmington in 1741. Died 1745. Longcase clocks.
Benjamin Chandlee Jnr.	Nottingham. Maryland	1723-1791 Trained by his father Benjamin in Philadelphia
Ellis Chandlee	Nottingham. Maryland	1755-1816 son of Benjamin Jnr. In partnership with brother Isaac.
Goldsmith Chandlee	Nottingham. Maryland	b.18.8 1751 son of Benjamin Jnr. Moved to Winchester Virginia in 1783. Clockmaker and instrument maker.
Isaac Chandlee	Nottingham. Maryland	1760-1830's son of Benjamin Jnr. In partnership with brother Ellis.
Peter Clare Snr.	Manchester	Born at Hatton, Cheshire. Recorded in Hatton Meeting register 14.12.1729. Moved to Deansgate Manchester. Made Acton St. Mary Church Clock in 1788. Public lecturer in Electricity, lightening, pneumatics and mechanics. Member of Hardshaw Q.M. Died 30.07.1799.
Peter Clare Jnr.	Manchester	Son of Peter Clare Snr. 6.14.4. 1781 registered in Hardshaw MM. Eminent clockmaker. Smokejack maker and house bell hanger. Worked at 50. Quay Street. Honorary member of the Literary and Philosophical Society – Secretary in 1821. Fellow of the Astronomical Society. Honour member of Manchester's Portico Library. Maker of Longcase clocks inc. musical, Watchmans clocks. Clock movements for wholesale. Regulator clocks House Bell Systems and Smoke Jacks. Died 24.11.1851. buried in Mount Street Quaker burial ground.
Samuel Clare	Hatton. Cheshire	18 <sup>th</sup> century Brother to Peter Clare Snr. and Thomas Clare.
Thomas Clare	Hatton. Cheshire	18 <sup>th</sup> century Brother to Peter Clare Snr. and Samuel Clare.

John Clark	Sudbury	18 <sup>th</sup> century.
William Clark	Kendal	18 <sup>th</sup> century Apprentice to Isaac Hadwen & Sedbergh.
Richard Coles Snr.	Buckingham	Born in Buckingham 20.6.1757. App. To William Atkins at Chipping Norton 1771. Moved to Buckingham 1784. Father to Richard Coles Jnr.
Richard Coles Jnr.	Buckingham	b.c. 1792 son of Richard Coles Snr. Clerk of Buckingham M.M from 1851. Died 30.11.1853.
John Cook	Manchester	18 <sup>th</sup> century. Death recorded at Hardshaw QM.
James Cooper	Manchester	Late 18 <sup>th</sup> century inc. by virtue he was briefly in partnership with John Bradshaw of Manchester.
John Cooper	Warrington	Late 17 <sup>th</sup> century working at ‘at the sign of the Swan at Boughton’ Chester in 1698. His illegitimate son James was baptised – presumably disowned, then moved to Warrington.
Abel Cottey	Crediton, Devon & Philadelphia	Pioneer American clockmaker. Born c. 1655. Sailed with William Penn aboard the ‘Welcome’ to Philadelphia in 1682. Returned to Devon in 1695 then back to Philadelphia in 1700. Lantern clocks signed from Crediton. Then known as a maker of tallcase clocks in Philadelphia. Trained Benjamin Chandlee, who later married Cottey’s daughter Sarah. Died in 1711, his inventory witnessed by Peter Stretch of Philadelphia.
John Cutte	Taunton	Disowned at Somerset Quarterly Meeting 26.9.1695.
Arthur Davies	Westleigh. Devon	Working at Westleigh between 1685-1700 then Tiverton. Described in documents referring to Quaker land at Cullumpton as “of Cullumpton” from 1708 to 1712, then Kentisbeare in 1723. Made Lantern clocks and musical posted movement thirty hour clocks.

John Davis	London	Born c.1671 App. To Daniel Quare in 1685. He took the following apprentices of his own who may have been Quakers- John Hoddle 1697 John Cooke 1700 (from Newport Pagnell) Francis Britten 1702 (from Newport Pagnell) Richard Scroope 1709.
Samuel Davis	London	Born c. 1626 app. To William Selwood 1641. Probably not a Quaker (his children were baptised) but included for his close ties to Quaker clockmakers. As beadle (appointed 1674) was responsible for placing apprentices with Quaker clockmakers. Died ante 1698. Longcase and lantern clocks known.
William Debenham	Sudbury	19 <sup>th</sup> century clockmaker.
Thomas Elms (Elms)	Wareham	Late 17 century clockmaker who then moved to Dorchester Represented Purbeck Meeting in 1692 then Dorchester Meeting between 1693-1704. Will dated 1. October 1706.
Thomas Eayre	Kettering	1691-1758. Ingenious country clockmaker, chimes maker, bell founder, surveyor and cartographer. Cast bells for St. Botolph's Boston Lincs. (Boston Stump). Birth registered at Kettering Quaker Meeting but later left the Society of Friends.
Joseph Eayre	St Neots	Son of Thomas Eayre. Ingenious provincial clockmaker who made equation of time clocks. Probably did not attend Quaker Meeting's beyond childhood.
Andrew Ellicott	Buckingham. Bucks County. Pennsylvania	Joseph Ellicott's eldest son b.24.1.1754. Trained as a clockmaker, became an instrument maker and eminent surveyor. Appointed by President George Washington as principal surveyor for the boundary lines for the new capital Washington DC. Appointed Surveyor General of the United States in 1792. Died 28.8.1820.

Joseph Ellicott	Philadelphia	One of America's greatest clockmaker's he was a mathematical and mechanical genius. Born 1732 at Buckingham. Buck County. Pennsylvania. Son of Andrew and Ann Ellicott (Andrew Ellicott came from Cullumpton Devon). Trained by Samuel Bleaker repairing old grist mills. Married Judith Bleaker (Samuel's daughter) in 1753. Visited England in 1767 to claim his legacy from his grandfather, keeping a journal of the trip. Moved to Maryland in 1774. Maker of one of the most complicated clocks ever made (No.32 of his output). A year, musical, moon phase, automaton, orrery, four dial longcase clock.
Ezra Enoch	Sibford Gower	Born 16.7.1799 Sibford Gower. Died 11.4.1860. Buried in Sibford Gower Quaker burial ground. One of the last North Oxfordshire Quaker clockmakers. Longcases recorded.
Thomas Etherington Snr.	York	Watchmaker made free in York in 1684. Died 1728. Lantern clock known.
Thomas Etherington Jnr.	York	Watchmaker. Son of Thomas Etherington Snr. died 1693
William Everleigh	Beominster	Late 18 <sup>th</sup> century clockmaker, ironmonger, cutler, locksmith brazier, tinman, toolmaker and finisher of bath and pantheon bells, who became a Quaker representing Bridport Meeting in 1778. Probably disowned by 1798 when he served as a corporal in the corps of infantry.
John Fardon Snr.	Deddington	Founder of the Fardon family dynasty of North Oxfordshire Quaker clockmakers. Born 13.2.1700 at North Newington. Trained by Thomas Gilkes Snr. at Sibford Gower. Father of John Fardon 2. Died in 1744. Maker of hoop and spike clocks in the North Oxfordshire Quaker tradition.

John Fardon 2	Deddington	Son of John Snr. born at Deddington 11.7.1736. Apprentice to John May of Witney then London. Returned to Deddington c.1756. Disowned in 1758. Father to Thomas Fardon 1 and John Fardon 3. Died 6.12.1786 and buried in Adderbury Quaker burial ground despite being disowned.
John Fardon 3	Deddington	Son of John Fardon 2. Born 1758 a Quaker, but baptised into the Church of England in 1781 prior to his marriage. In partnership with his brother Thomas at Deddington until his death by suicide in 1801.
Thomas Fardon 1	Deddington	The son of John Fardon 2, born 1757 a Quaker, but baptised into the Church of England in 1777 prior to marrying out. Re-admitted to the Adderbury Meeting in 1810, widowed then remarried at Deddington parish church in 1814 and disowned. Received back into Adderbury Meeting with his wife Lydia in 1823. Left the Society of Friends again after Lydia's death, eventually became a church warden at Deddington. Died 6.12.1838 and buried in Deddington churchyard.
Benjamin Ferris	Philadelphia then Wilmington	Born 1780 at Wilmington. Delaware. Apprentice to Thomas Parker of Philadelphia in 1794. Freed then worked in Philadelphia until 1813 then returned to Wilmington. Died 1867.
John Foster	London	Born 1666. Apprentice to Daniel Quare 1680, free c.1689/90. His own apprentices were – Jacob Foster in 1691 and Edward Jagger in 1694.
Samuel Frotheringham	Holbeach	18 <sup>th</sup> century. Died 1745

John Fry	Sutton Benger	An important Quaker and clerk to the London Yearly Meeting in 1746, 1751 and 1756. Born in 1701, apprenticed in London and moved to Knaresborough then settled at Sutton Benger in 1726. A leading member of Chippenham Meeting. Traded with other Quaker clockmakers including the Hadwen's of Liverpool and the Gilkes family in North Oxfordshire. His son Joseph Fry founded J.S. Fry & Sons the famous chocolate firm. John Fry died at Melksham in 1755 "an eminent preacher among the people call'd Quakers, very deservedly and extensively lamented." Sold North Oxfordshire hoop and spike clocks.
George Gailor (Golor)	Philadelphia	Apprentice/Journeyman to Peter Stretch in Philadelphia. Made at least 23 clocks signed Peter Stretch. Died intestate in Philadelphia in 1759.
Benjamin Gilkes	Devizes	Born 8.11.1783. Son of Richard Gilkes of Devizes. Moved to Nailsworth c.1808 where in 1810 he is recorded as a Schoolmaster. Died 20.1.1860.
John Gilkes	Shipston on Stour	Born 1707 Son of Thomas Gilkes Snr. of Sibford Gower. Moved to Shipston 1737. Trained his son Thomas Gilkes and fellow apprentices – John Bretell 1752, Thomas Hutchings 1761. Represented Shipston Meeting on numerous occasions at the Quarterly Meeting. Died c.1790. Maker of hoop and spike clocks in the North Oxfordshire tradition for wholesale and retail.
John Gilkes	Sibford Gower	Born 21.1.1748 the son of Thomas Gilkes 2 of Sibford Gower. Apprentice to his father 7 Sept,1764. Died ante 1773
John Gilkes	Chipping Norton	Born c.1775 the son of Thomas Gilkes of Shipston, apprentice to John Wells of Shipston 1789. Moved to Chipping Norton 10.6.1799. A member and then trustee of Chipping Norton QMH in 1809.

Richard Gilkes	Adderbury	Born 18.1.1715 the youngest son of Thomas Gilkes Snr. of Sibford. Moved to Adderbury c.1744 to become the most famous of the North Oxfordshire Quaker Clockmakers. Apprentices – Richard Tyler 1747, John Millard 1752, William Harris 1755, Matthias Padbury 1764, Joseph Soden 1766, Thomas Eaton 1768, Joseph Williams 1778, Charles Saunders 1780, Richard Gilkes (great nephew) 1780. A member of Adderbury Meeting, represented Banbury MM. at the London Yearly Meeting in 1753. He died at 14.2.1787 and was buried in Adderbury Quaker burial ground. The most prolific maker of hoop and spike clocks in the North Oxfordshire tradition.
Richard Gilkes	Devizes	Born 15.12.1745 the second son of Thomas Gilkes 2 of Sibford. Moved to Devizes and became a leading member of that Meeting. Father of Benjamin Gilkes of Devizes. Died 1822.
Richard Gilkes	Sibford Gower	Born 19.6.1767 the son of Thomas Gilkes 3 of Charlbury. Apprentice to Richard Gilkes of Adderbury in 1780. Returned to Sibford where he died 1.2.1855 and is buried in Sibford Quaker burial ground albeit he was no longer a member of the Religious Society of Friends.
Thomas Gilkes Snr.	Sibford Gower	Born c.1675 at Sibford Gower. Founder of Gilkes family clockmaking dynasty in North Oxfordshire. Trained each of his three sons – Thomas 2., John and Richard and John Fardon of Deddington as clockmakers. He was an important Quaker ‘minister’ within the Banbury division, representing them at the London Yearly Meeting six times between 1725 and 1737. Died in 1757, his testimonial is recorded at Sibford MM 4.4.1757. Maker of hoop and spike clocks in North Oxfordshire Quaker tradition.

Thomas Gilkes 2	Sibford. Gower	Born 8.1.1704 the son of Thomas Gilkes Snr. of Sibford. Trained his 3 sons Thomas 3, Richard and John and William Green of Milton as clockmakers. Membership of Sibford PM_ eventually becoming clerk. Represented the Banbury division at the London Yearly Meeting in 1751 and 1764. Died in 1772 and buried in Sibford Quaker burial ground 4.10.1772. Maker of hoop and spike clocks in North Oxfordshire Quaker tradition.
Thomas Gilkes	Charlbury	Born 25.5.1736 the son of Thomas Gilkes 2 of Sibford. Moved to Charlbury in 1764. Took John Wells of Shipston as apprentice in 1766. Represented Charlbury at the Quarterly Meetings between 1770-1778. Died 14.2.1779. Maker of hoop and spike clocks in North Oxfordshire Quaker tradition.
Thomas Gilkes	Shipston	Born c.1740's the son of John Gilkes of Shipston and trained by him. He took his own apprentice William Hackall in 1779. Retired to Adderbury in 1786. Died c.1798.

George Graham	London	The most eminent clockmaker of his time. Born c.1673 in Kirklington of Irthington parish Cumberland the son of George Graham, a farmer who became a Quaker after George's birth. Apprentice to Henry Aske of London in 1688. Worked for Thomas Tompion whose niece Elizabeth he married in 1704. In partnership with Tompion until Tompion died in 1713, then took over the business at the Dial and Three Crowns from his old master. He became a Warden of the Clockmakers Company and then Master in 1722. He was a fellow of the Royal Society and is credited with several important inventions - the deadbeat escapement (1715), the mercury pendulum (1726) and perfected the cylinder escapement (1726). As well as the high-quality clocks and watches he was also an important scientific instrument maker. He died in 1751 and is buried in Westminster Abbey. There is no evidence that he remained a Quaker after moving to London.
William Graham	London	Born 1692 the nephew of George Graham. Worked in Lombard Street. Married Anne Bedford daughter of Thomas Bedford. Moved to St. Michael's Cornhill and then to Philadelphia. Died 1759.
Jacob Goodger	Manchester	Late 18th century. Member of Hardseshaw Quaker Meeting
John Greaves	Newcastle	Born c.1725 the eldest son of Richard Greaves. Working in Newcastle by 1746. Premises on the Quayside c.1780-1794. Ceased to be a Quaker during adulthood. Died 1794.
Peter Greaves	Newcastle	Son of Richard Greaves. Working in Newcastle 1747-1755.
Richard Greaves	Newcastle	From Halifax, was working in Newcastle c.1730. His sons John, William & Peter Greaves all became clockmakers in Newcastle. Died 1741.

Thomas Greaves	Newcastle	Born 1763 the son of William Greaves who worked at 52 Quayside. Owned land which later became a Quaker burial ground known locally as "The Quicks Burying Plas in Sidgatt." Died c.1830.
William Greaves	Newcastle	Born 1733 the son of Richard Greaves. Worked at the foot of Plummer Chare Quayside in 1778. A prosperous clockmaker whose dials were engraved by the renowned firm of Bielby & Bewick between 1772 and 1775.
James Green	Gloucester	18 <sup>th</sup> century married at Tewkesbury Q.M.H. in 1721. Longcase clocks known.
William Green	Milton under Wychwood	Born Tadmarton near Banbury 1722. Apprentice to Thomas Gilkes of Sibford. Moved to Milton under Wychwood 1752. Member of Milton P.M. and Witney MM. Died c.1802. A prolific maker of North Oxfordshire hoop and spike clocks.
John Grundy	Manchester	Apprentice to Peter Clare Snr. 1761
William Gunn	Wallingford	Married Mary Fuller at Shutford MH on 19.5.1714. Apprentices - Robert Buller (Banbury) 19.3.1719 and Richard Fowler from Shutford in 1724. Maker of 30 hour and 8 day clocks.
Isaac Hadwen Snr.	Sedbergh & Kendal	Born at Burton - in - Kendal, Westmorland in 1687. Apprentice to John Ogden of Askrigg, Wensleydale from 1701-1708. Worked at Sedburgh from c.1710 producing clocks in the north western Quaker tradition with verse engraved dials. Married Sarah Moore the daughter of Dr John Moore of Eddroth Hall, Clapham, a prosperous local Quaker. Moved to Kendal 1722 then to Over Gayle, Tunstal, Lancashire. Trained his son Isaac Bispham 1727. Thomas Fawcett 1727, William Clark 1730 and Fryer Rider 1733. Made two trips to America firstly 1719 and then again in 1737 where he died of fever at Chester, Delaware on 29.7.1737.

Isaac Hadwen 2	Liverpool	Born 1723 at Kendal, the son of Isaac Snr. Moved to Liverpool c.1737. Made 8 day clocks for retail and wholesale. Died 1767.
Isaac Hadwen 3	Liverpool	Son of Isaac 2. Retired from clockmaking in 1799 to spend the rest of his life campaigning against slavery.
Joseph Hadwen	Liverpool	Born 1725 at Liverpool, the son of Isaac 2. Left clockmaking to go into the grocery and drapery trade. Died 1807.
Sarah Hadwen	Liverpool	Widow of Isaac Hadwen Snr. Moved to Liverpool and managed business until son Isaac 2 was able to take over. Died in 1761.
Joseph Hall	Alston	Born 1767 moved to Alston c.1800. Later ran the Quaker School at Wigton from c.1826. Known for two complicated long duration clocks.
William Hargreaves	Settle	Born c.1705. Trained sons William Jr. & Thomas as clockmakers at Settle. All three were prolific makers of 30-hour longcase clocks. Died 1779.
William Hargreaves Jr.	Settle	Born c.1734 died 1809
Thomas Hargreaves	Settle	Born 1741 died 1813
Thomas Harris	Deddington	Born 1732 at Sibford Gower. Married Mary Fardon from North Newington at Banbury QMH in 1762. Son William became a clockmaker at Witney. Member of Adderbury P.M. & Banbury MM. Clocks signed at North Newton (Newington) Bloxham and Deddington. Retired to Milton (a hamlet of Adderbury). Died 1.8.1797 and buried in Adderbury Quakers burial ground. Made North Oxfordshire Quaker hoop and spike clocks.
William Harris	Witney	Born c.1760's son of Thomas Harris of Deddington. Moved to Witney 1793. Disowned by Witney MM. on 8.9.1794 for marrying outside the Society of Friends.

William Harrison	Charlbury	Said by Beeson "Clockmaking in Oxfordshire" to be a Quaker. Mid 18 <sup>th</sup> century.
Jeremiah Henderson	Scarborough	Born 1718 the son of Robert Henderson.
Robert Henderson	Scarborough	Born in 1678 at Oughterby near Wigton Cumberland. Moved to Scarborough in 1708. Prolific maker of 8 day and 30 hour clocks, some early examples with blank dial corners in the Quaker style of the north west of England. Apprentices Joseph Oxley of Brigg c.1730. Richard Ward 1742. Robert Henderson died 1756.
Stephen Horseman	London	Born Brayton, Yorkshire c.1688, the son of Stephen Horseman a wheelwright. Apprentice to Daniel Quare of London 1702. Freed c.1709. Married Quare's niece Mary Savage in 1712. Went into partnership with Quare c.1721 and took over the business when Quare died in 1724. Went bankrupt in 1730.
Richard How 2	Dorchester	Born 1667. Represented Dorchester Meeting. Father of Richard 3. Apprentice – Ralph Norman (Poole) in 1707. Died 29.10.1714. Maker of distinctive 30-hour longcase clocks with blank dial corners favoured by some early Quaker clockmakers.
Richard How 3	Dorchester	Succeeded his father in 1715. Appears to have been disowned for marrying outside the Society of Friends.
Benjamin Huntsman	Doncaster	Born 1704 at Epworth, Lincolnshire of German parents. Famous as the inventor of crucible steel. Worked in Doncaster from c.1725 until 1742. Moved to Handsworth, Sheffield 1742 and set up as a steelmaker there in 1751. Died 20.6.1776.

John Ismay	Wigton	Born in 1699 at Thursby. Apprentice to John Ogden at Bowbrigg Hall. Askrigg in 1711. Worked at Oulton near Wigton from c.1718 to c.1737. Died 1755. Made 30 hour clocks in the distinctive early 18 <sup>th</sup> century Quaker style unique to north west England – lantern style movements with blank or religious verse engraved dials. Also, made a brass quadrant.
William Johnston	London	Born c.1677. Inc. in list for being a Daniel Quare apprentice 1690. Free 1702.
Larkum Kendall	London	Famous chronometer maker. Born at Charlbury in 1721. The son of Moses Kendal, a leading member of the Charlbury P.M. and Witney MM. Apprentice to John Jeffreys of London in 1735, then worked for George Graham before setting up in business at 6, Furnival's Inn Court. A member of the panel appointed by the Board of Longitude in 1765 to whom John Harrison was obliged to reveal the construction of his fourth marine timekeeper - H4. Contracted by the Board of Longitude to make an exact copy of H4. (for £450) which became known as K1 and was delivered to the Board in 1770; after trials at Greenwich it was assigned to Captain Cook for his second voyage to the South Seas aboard HMS Resolution in July 1772; it accompanied Cook on his final voyage in 1776. Kendall made two other marine chronometers known as K2 and K3, K2 was with Captain Bly at the time of the mutiny on board HMS Bounty and K3 was on board the Discovery on Cook's final voyage to the Pacific in 1776. In contrast to his precision watches, a hooded wall clock by Larkum Kendal has also been noted. Kendal died 22.11.1790.
James Kenway	Bridport	Born 1742. Member of Bridport Meeting. Died 1821.

Ann Kirk	Nottingham	Took over her father Joseph Kirk's business. Married out of the Society of Friends and was disowned by Nottingham Meeting on 1.1.1738.
Joseph Kirk	Hardstoft	Born 1673 at Hardstoft, where some clocks are signed. Had moved to Skegby Derbyshire by 7.5.1723 when he took Robert Willis as apprentice, he moved to Nottingham by 29.5.1731 when he took Patrick Cook as apprentice. The local Quaker M.M. minutes include a marriage consent certificate in 1708.
John Knight	Great Coggerhall	Early 19 <sup>th</sup> century
Theodore Lamb	Sibford	Born 6.2.1881 known as the Sibford Hermit, who lived by the road side near Sibford. Much respected 20 <sup>th</sup> century clock and watch repairer. Died 1951 and buried in Sibford Quaker burial ground.
Stephen Levitt 1	Sudbury	Late 17 <sup>th</sup> century "Sudbury Quakers 1655-1953" S.H.G. Fitch. tells us he was listed among Friends imprisoned in the town for their beliefs prior to 1685. Lantern clock maker.
Stephen Levitt 2	Chelmsford	A Quaker clockmaker of this name, aged 45 is recorded in the Middle Row, Chelmsford in 1734. Presumably the son of Stephen Levitt of Sudbury.
Jacob Littlemore	Frodsham	Born 1689 Frodsham, the son of Joseph Littlemore. Working at Frodsham in 1718 when he took William Whitaker apprentice. Married 1713. Leased a quay in 1726 and bankrupt by 1728 and presumably disowned. Moved to Bersham (Wrexham) then Ruoban where he died in 1745, described as a gentleman.
Joseph Littlemore	Frodsham	Born Frodsham c.1650. Lived at Kinsley and became a Quaker. Married Hannah Williamson at Newton QMH in 1687. Moved to Frodsham c.1690 then to Preston on the Hill c.1712. Described as a clockmaker, smith, gunsmith and whitesmith. Died 23.4.1721 and buried in Newton Quakers burial ground. Longcase and lantern clocks known.

John Marshall	London	Born c.1668. First apprentice to Samuel Rasse in 1682 then Daniel Quare. Free 1689. Advertised as a 'watchmaker at Rainbow Coffee House in Cornhill Nr. Birchin Lane' in 1694, then in 1695 as 'watchmaker against the Royal Exchange in Cornhill.' Apprentices – Thomas Stevens 1693. Free 1702, Wasteney's Law 1694, John Hewitt 1694, Ephraim How 1716 (passed over to George Graham). High quality month duration and 8 day longcases known.
Edward May Sr.	Witney	Born 1701 at Milton near Abingdon, the son of Edward May a miller and Quaker minister. The Witney M.M. minute book records he was living at Witney by 13.2.1724. Trained sons John and Edward as clockmakers. Apprentices Benjamin Thorpe 1726, John Lord 1739. Trustee of Milton under Wychwood QMH in 1735.
Edward May Jr.	Witney Henley on Thames Ampthill	Born 25.9.1732 the second son of Ed May Sr. Moved to premises in the Market Squaer Henley on Thames 1754. Thought to have moved to Ampthill Bedfordshire c.1784 where he died 19.1.1805 and was buried in the Quaker burial ground there.
John May	Witney	Born 5.10.1726 the eldest son of Edward May Jr. Apprentices – John Fardon 2 (Deddington) 1750, Benjamin Ward 1753, Richard Pocock 1760, also trained his son Thomas May. Long serving member of Witney Meeting (minute book records 1749 - 1794). Died 14.4.1800. Prolific maker of 30 hour longcases. Also, made spit engines and carried out engraving.
Thomas May	Witney	Born 25.2.1750 son of John May of Witney. Moved to Henley on Thames to take over his uncle's clockmaking business in 1784. Thought to have given up clockmaking to become a school teacher in Henley. Died 1820 and was buried in the local Quaker burial ground (Warborough Division).

Mark Metcalfe	Askrigg	Born Askrigg 1693. Thought to have been an apprentice to John Ogden of Askrigg by virtue of his use of blank dial corners in his earliest clocks.
James Mogg	Basingstoke	Late 17 <sup>th</sup> century and early 18 <sup>th</sup> century. Died 1722. Longcases & bracket clocks.
John Nethercott	Long Compton	May have been born a Quaker at Long Compton c.1665. He was baptised into the Church of England as an adult in 1686 prior to marriage. Two sons John Jnr. & William became clockmakers. Died 1735. Produced hoop and spike clocks and 30 hour clocks with ring and zig zag engraved dials in the North Oxfordshire Quakers tradition.
James Norman	Charminster	Born c.1671. His son Ralph became a clockmaker. 30 hour longcases known.
Ralph Norman	Poole	Born 1690 at Charminster, the son of James Norman. Apprentice to Richard How of Dorchester 1705. Moved to Poole c.1714. known for high quality longcase clocks inc. quarter striking examples.
Bernard Ogden	Darlington, Newcastle, Alnwick, Sunderland	Born 1707 at Askrigg the son of John Ogden. Died 1750. Longcase clocks.
John Ogden	Askrigg	Born 1665 the third son of James Ogden Snr. clockmaker of Soyland. Moved to Bowbridge Hall, Bainbridge a hamlet of Askrigg in Wensleydale. Trained sons John Jnr. & Bernard. Apprentices – John Isaac, Isaac Hadwen, John Sanderson, Robert Brownlow and Mark Metcalfe. Moved to Darlington between 1711 and 1715 where he died in 1741. Pioneer of the distinct north west of England Quaker style of 30 hour clocks.
John Ogden Jnr.	Darlington	Born at Askrigg 1704 the son of John Ogden snr.

Thomas Ogden	Halifax	Born at Soyland near Ripponden in 1693 the son of Samuel Ogden Snr. clockmaker. Moved to Halifax by 1740. Apprentices – John Barlow, 1733, William Anderson 1750, John Ellis 1754. Died without issue 1769. An eminent provincial clockmaker. Known to have supplied movements to George Graham of London.
Joseph Oxley	Fakenham Norwich	Born 1715 at Brigg (Lincs). Apprentice to Robert Henderson of Scarborough c.1730. then moved to London to learn watchmaking. Set up in business at Fakenham then moved to Norwich c.1744. Apprentice – Thomas Wilkins 1749. Gave up clockmaking to go into worsted manufacturing at Norwich during the mid 1750's (see a Journal of the Life and Gospel Labours of Joseph Oxley of Norwich. 1837).
Charles Pace	London	Born 1816 the son of Thomas Pace Jrn. In partnership with brother Henry and then took over the premises at 128 Whitechapel High Street. Had given up clockmaking by 1851.
Edmund Pace	London	Born 1813 the son of John Pace at Bury St. Edmunds. Moved to London by 1841 at 21 Thavies Inn Holborn. Had given up clockmaking by 1844 and later set up the Phoenix Match Co. of Pace & Son at Bow Common.
Henry Pace	London	Born 1809 the son of Thomas Pace Jrn. Took over the business at 128 Whitechapel High Street, then in partnership with brother Charles. Moved to Exmouth in 1837. Returned to Clerkenwell in 1842, then moved to West Ham by 1861.
Henry John Pace	Bury St. Edmunds	1814-1842 son of John Pace (the skeleton clock maker)
Henry John Pace Jnr.	Ottawa	Son of Henry Pace. Moved to Canada c.1862 then to St. Paul Minnesota c.1880. Died 1899 in Lethbridge. Northern Territories (Alberta)

John Pace	London	Born 1748 worked c.1774-1794 at 19 Broad Street Ratcliffe then 19 Cock Hill Ratcliffe. Elder Brother of Thomas Pace Snr.
John Pace	Bury St. Edmunds	Son of Quaker Thomas Pace Snr. Active 1804-1857. Moved from London to 19 Abbeygate Street Bury St. Edmunds then to Chelmsford in 1857. Sons - Edmund and Henry became clockmakers. A famous 19 <sup>th</sup> century maker of high quality skeleton clocks.
Thomas Pace Snr.	London	Born 1752. Worked at 128 Whitechapel High Street. Sons Thomas Jnr. And John became clockmakers. Retired to Chelmsford. Died 1819 & buried at Whitechapel.
Thomas Pace Jnr.	London	Born 1777 son of Thomas Pace Snr. Worked at 128 Whitechapel High Street. Trained sons Henry & Charles. Died 1829.
Matthias Padbury	Burford	Born 3.8.1751 at Sibford Gower. Apprentice to Richard Gilkes of Adderbury 1764. Set up in business in Burford High Street 1773. Married first wife Sarah at Milton under Wychwood QMH in 1774. Became a prosperous business man owning a paper mill in the town. Member of Burford P.M. and Witney M.M. Died c.1806. Maker of hoop and spike clocks in the North Oxfordshire Quaker tradition.
John Paine	Banbury Hook Norton	Born 1801 at Milton in the parish of Adderbury. In business on Parsons Street Banbury then moved to Hook Norton in 1826. Disowned on 1.1.1851 for embezzling Quaker funds.
Samuel Parrott	Killington (Westmorland)	Born c.1719 died 1783. Longcase clocks.
Isaac Pearson	Burlington New Jersey	1685-1749. Clockmaker & Goldsmith. His daughter Sarah married his apprentice Joseph Hall.

Daniel Quare	London	One of the most famous of all clockmakers, born c.1647 in Somerset. Unwilling to swear an oath he became a free Brother in the Clockmaker Company in 1671. He worked from premises in St. Martin's Le Grand in the 1670's by 1681 he was at Allhallow Lombard Street, then at the sign of the king's Arms in Exchange Alley. Apprentices – John Beck 1673, George Heady 1675, Faith Leak 1684, John Foster 1680 Robert Todd 1684, John Davis 1685 John Marshall pre-1689, William Johnson 1690, John Zachary free 1694, John Kirkton 1696, John Nolson free 1697, Stephen Horseman 1701, Richard Vick free 1702, Joseph Appleby 1705, Daniel Quare (son of Robert Quare) 1707. Around 1721 he went into partnership with his former apprentice Stephen Horseman. A prolific maker of longcase and spring (bracket) clocks, some of the very highest quality. Awarded a patent for a portable weather glass (barometer) in 1695. He was a Clockmakers Company Assistant from 1700, Warden from 1705 and Master in 1708. Despite not swearing an oath he was Royal Clockmaker to King. Died 21.3.1724 and was buried in the Quaker burial ground Bunhill Fields.
Benjamin Reeve	Philadelphia	Mid 18 <sup>th</sup> century. Journeyman for Thomas Stretch.
Francis Richardson	Philadelphia	1765-1782 Clockmaker & Goldsmith
John Richardson	Bridlington	c.1690.
Richard Roe	Epperstone Notts.	Born c.1637. Trustee of Long Croft in Oxtou QMH. Died 22.3.1720 and buried in Oxtou Quaker burial ground. Lantern clocks & Turret clocks.
Emanuel Rowe	Philadelphia	18 <sup>th</sup> century. Apprentice/journeyman for Peter Stretch.

John Sanderson	Wigton	Born 1671 and thought to have been apprentice to John Ogden of Askrigg. Married Elizabeth Pearson a Quaker. Died 1755. Prolific maker of lantern posted 30 hour clocks with verse engraved dials in the unique North Western Quaker tradition.
Jeremiah Sewell	London	Apprentice to Thomas Pace 1786. Worked at Tottenham c.1799.
Thomas Savage Snr.	Clifton Westmoorland	m.1699 sons Thomas Jnr & Jonathan were clockmakers.
Thomas Savage Jnr.	Clifton	Born 1700 died 1731. Longcase clocks.
Jonathan Savage	Clifton	Born 1712. Died after 1745. Longcase clocks.
Benjamin Simms	Witney Chipping Norton	Dates unknown.
Charles Price Simms	Chipping Norton	Born 1820 son of Samuel Simms. Clerk to Chipping Norton P.M. Died 1910.
Daniel Rutter Simms	Chipping Norton	Born 1864 son of Charles Price Simms. Died 1954.
Frederick Simms	Chipping Norton	Born 1816. Died 1894.
John Simms Snr.	Chipping Norton	18 <sup>th</sup> century. Father of John Simms Jnr.
John Simms Jnr.	Chipping Norton	Born 1757. Apprentice Richard Lamb 1794. Died 1823.
Samuel Simms	Chipping Norton	Born c.1784 son of John Simms Jnr. Died 1869.
William Simms	Chipping Norton	Active c.1790.
Daniel Simpson	Carlisle	Son of John Simpson of Wigton. Moved to Workington c.1810. Died 1841.
Edmund Simpson	Preston	Born 1794 son of Stephen Snr.
Isaac Simpson	Chorley & Preston	Born 1800 son of Stephen Snr. Worked at Chorley before moving to Preston. Married outside the Society of Friends and was disowned. Gave up clockmaking and patented a machine for making gold thread. Died 1859.
John Simpson 1	Wigton	In business with brother Joseph c.1758. Died 1796.
John Simpson 2	Wigton	Son of Joseph Simpson of Wigton. Died 1837.

Joseph Simpson	Wigton	In business with brother John c.1758
Stephen Simpson	Kirkby Lonsdale Preston	Born 1752 Gisburn Yorks. Worked at Kirkby Lonsdale then moved to Preston by the the sign of the Tup's Head. Longcase & Turret clockmaker. Died 1821.
Stephen Simpson Jnr.	Preston	Born 1791 son of Stephen Simpson Snr. Took over business in 1822. Moved to Mansfield to manufacture gas meters. Died 1840.
William Simpson	Preston	Born 1781 son & journeyman of Stephen Simpson Snr.
William Smith	Dorchester	Active c.1684-1730. Member of Dorchester Meeting 1677 to 1730.
Jeremy Spurgin	Colchester	Born 1666. Noted maker of longcase clocks. Died 1699.
Francis Stamper	London	Born 1655 at Allhallows near Wigton Cumberland. Apprentice to Samuel Davis London 1675, free 1682. Apprentices: Joshua Penford 1684, Daniel Moore 1689, Joseph Foster 1684, Thomas Hymans 1696. A very prosperous Quaker clockmaker who worked in Lombard Street, with property at Doncaster, Stanford, Tottenhoe, Torpenhow and Allhallows in Cumberland. He owned land in Pennsylvania, mining shares in Cumberland and Lancashire and a half share in the trade of the East India Company held jointly with Daniel Quare. Maker of Longcases, spring (bracket) and lantern clocks. His widow went into partnership with Joshua Wilson. Died 1698 and buried in the Quaker burial ground at Winchmore Hill.
John Stokes	Saffron Walden	From Dunmow (Essex). Working at Saffron Walden c.1660. Apprentice Thomas Pilbrow 1717. Died c.1723.
Batty Storr	York	Born Selby 1710 the son of Marmaduke Storr. Working at York c.1730. Son Isaac became clockmaker. Apprentice Joseph Champney 1745, William Vincent 1751. Died 1793.
Isaac Storr	York	Born 1750. Son of Batty Storr. Worked for Batty Storr. Died 1775.

Jonathan Storr	York	Born 1739 the son of Batty Storr. Moved to London by 1769. Left the Society of Friends. Died 1812 and buried at Acomb near York.
Marmaduke Storr Snr.	Selby	Born 1667 Owstwick, East Riding. Moved to Selby 1691. Also, owned a tannery. Sons Marmaduke Jnr. And Batty Storr became clockmakers. Married the daughter of George Canby an early Quaker clockmaker.
Marmaduke Storr Jnr.	Selby London	Born 1702 at Selby the son of Marmaduke Snr. Said to have been apprentice to Stephen Horseman of London. A partner in Storr & Gibbs of London working c.1741-1750. Died 1750.
Benjamin Stretch	Bristol	Born c.1700 son of Samuel Stretch of Leek. Moved to Bristol c.1723. Apprentice Samuel Stretch 2. Died 1764. Buried Bristol Quaker burial ground. Longcase clocks and watches.
Daniel Stretch	Salem County	Born 1694 at Leek, emigrated to Philadelphia with his father Peter Stretch in 1703. Moved to Salem County in 1714. Died c.1735.
Isaac Stretch	Birmingham	Born 1696 son of Samuel Stretch of Leek. Moved to Birmingham with his father c.1712. Apprentice Walter Sturley 1715. Died at "the Watch out of Doors" 97 High Street, Birmingham.
Isaac Stretch	Philadelphia	Peter Stretch's grandson born 1714, the son of Daniel Stretch. Worked as a journeyman for his uncle Thomas. Disowned in 1751 for enlisting in the militia. Died after 1770.
James Stretch	Birmingham	Son of Samuel Stretch Snr. Worked from c.1735-1770.
John Stretch	Leek Bristol	Born 1668 at Tatton Cheshire, brother of Samuel and Peter Stretch. Moved to Bristol by 1703.
Joseph Stretch	Birmingham	The son of Samuel Stretch. Born c.1691 (after another infant brother of that name died in 1690) Apprentice: John Walker 1717.

Peter Stretch	Leek Philadelphia	Born 1670 Harpers Gate, Horton near Leek, Staffordshire. Worked at Leek with brother Samuel Snr. Emigrated to Philadelphia in 1703 (arrival). His clockmaker sons Daniel (b.1694), Thomas (b.1697) and William (b.1701) were all born in Leek and trained by Peter Stretch in Philadelphia. In business on the corner of Front Street and Chestnut Street which became known as “Peter Stretch’s Corner”. Apprentices: John Davis and Emmanuel Rose. Peter Stretch made Lantern and longcase clocks at Leek and was a prolific maker of American tallcase clocks in Philadelphia. Became a Philadelphia common councilman in 1708. One of America’s most famous clockmakers. Died 1746.
Samuel Stretch Snr.	Leek Wolverhampton Birmingham Bristol	Born 1657 at Tatton Cheshire, elder brother of John and Peter Stretch. Worked in Stockwell Street, Leek. Sons Benjamin and Samuel Jnr. Became clockmakers. Moved to Rotten Row, Wolverhampton 1697 where the building was licenced as a Meeting House. Moved to Birmingham 1712 and then finally to Keysham Bristol by 1714 to join Brother John. Died 1732. Longcase and Lantern clocks.
Samuel Stretch Jnr.	Bristol Philadelphia	Son of Samuel Stretch Snr. Left England in c.1711 to join his uncle Peter Stretch in Philadelphia where he died in 1732.
Thomas Stretch 1	Philadelphia	Born 1697. Leek the son of Peter Stretch. Took over his father’s business. Made the turret clock for the State House in 1753. Disowned by Philadelphia M.M. for marrying outside the Society of Friends in 1743. Died 1765. Prolific maker of Tallcase clocks.
Thomas Stretch 2	Philadelphia	Born 1741. Peter Stretch’s grandson, trained by his uncle Thomas Stretch in Philadelphia. Moved to Burlington, New Jersey. Disowned by Philadelphia M.M. in 1765 for drinking and neglect of his business. Died 1770.

William Stretch	Philadelphia	Born 1701 Leek. Worked as a journeyman for his father Peter Stretch. Died 1746.
Daniel Tantum	Nottingham Derby	Born c.1690. Apprentice: William Barnard of Newark. Worked at Nottingham from c1714 then moved to Derby c.1741. Disowned by Society of Friends for marrying outside. Longcase and spring (bracket) clocks.
Francis Tantum	Loscoe	Born 1674 Loscoe. Brought up by his Quaker uncle. Appears to have been disowned for marriage outside the Society of Friends. Apprentices: Thomas Norman 1706, James Woolley 1712. Died c.1729. A well-known maker of good quality longcase clocks.
Jonathan Tantum	Derby	Son of Daniel Tantum. Died 1732.
John Terry Snr	York	Thought to have been a Quaker. Worked at York between 1706 until his death in 1757. Trained each of his sons as clockmakers.
John Terry Jnr.	York	Born c.1696 son of John Snr. Died 1783.
Reuben Terry	York	Son of John Terry Snr. Free 1713 and worked in York until at least 1724.
Thomas Terry	York	Born c.1705 son of John Terry Snr. Apprentice to his father 1720. Free 1733.
Robert Todd	London	Born c.1670. Apprentice of Daniel Quare 1684. Working until c.1740.
William Tomlinson	London	Born c.1673. Free 1699. Worked in Miles Lane, then near Royal Exchange then White Hart Court, Gracechurch Street. Apprentices: James Snelling 1703, Jonathan Newton 1708, Deveraux Bowby 1710, Joseph Taylor 1714. Master of Clockmakers Company 1733. The famous Quaker Physician Dr John Fothergill lodged with him in White Hart Court from 1741. taking over the premises in 1747, describing his lodgings as "Tis a watchmaker in Whitehart Court next door to the meeting house".
Edward Thorp	Colchester	Born 1752 son of Thomas Thorp. Moved to Bethnal Green London c.1785. Returned to Colchester c.1786. Died 1831.

Thomas Thorp	Colchester	Born 1717. Made clocks and watches from premises in St. Runwald's parish. Elected overseer of the poor in 1748. Died 1804.
Richard Tyler	Wallingford	Born 1733. Apprentice to Richard Gilkes of Adderbury. Moved to Wallingford 1756. Apprentices Daniel White 1769, Robert Keate 1775, William Panter 1781. Retired to Adderbury. Died 11.6.1800 – buried in Adderbury Quaker burial ground. Longcase clocks.
Thomas Virgo	London	Born c.1660 Thetford. Apprentice to Samuel Davis 1674. Free 1682. Apprentice Robert Baldwin 1682. Died 1685. Lantern clocks.
Thomas Wagstaffe	London	Born 1724 at Banbury. Moved to London. Worked in Gracechurch Street. Famous Quaker clockmaker who traded widely with American Quakers visiting the London Yearly Meeting. Gave gallery clock to Pennsylvania Hospital. Wrote "Piety Promoted" published in the 1750's. Retired to Stockwell Surrey then finally to Chipping Norton in 1802 where he died. Longcase & spring (bracket) clocks inc. automaton bracket clocks.
Richard Wall	Bristol	Free 1631. Clockmaker and goldsmith
John Wells Snr.	Shipston on Stour	Born 1749 at Byfield, Nortants. Apprentice to Thomas Gilkes 3 of Charlbury in 1766. Worked at Sibford Gower. Apprentices: John Gilkes (Chipping Norton) 1789, Thomas Heydon 1794. Member of Armscote and Shipston PM's Trained sons John Jnr. & Thomas. Died 1810. Maker of hoop and spike clocks in the North Oxfordshire Quaker tradition.
John Wells Jnr.	Shipston on Stour Chipping Norton	Born 1787 son of John Wells Snr. In partnership with brother Thomas before moving to Chipping Norton, where he was disowned at Charlbury M.M. for immoral behaviour in 1820. Returned to Shipston in later life & re-admitted to Shipston P.M. Died c.1847.

Thomas Wells	Shipston on Stour	Born 1786 son of John Wells Snr. Took over family business in 1810, then in partnership with brother John. Died 1855.
Joseph Williams	Adderbury	Born Adderbury 1762. Apprentice to Richard Gilkes of Adderbury. Son William became a clockmaker. Died 1835 and buried in Adderbury Quaker burial ground.
William Williams	Adderbury	Born 1793 son of Joseph Williams. Baptised into the Church of England as an adult in 1820. Re-admitted to Adderbury PM in later life. Died 1862 and buried in Adderbury Quaker burial ground. Longcase and fusee wall clocks.
Joseph Williamson	London	Thought to have been a Quaker. Working in Clements Lane. Apprentices: Joseph Grove 1681, Isaac Johnson 1698, Samuel Jenkins 1712 and William Williamson 1717. Master of the Clockmakers Company 1724. Well known for his equation of time clocks and most probably supplied that element to other clockmakers.
Joshua Wilson	London	Born c.1675. Apprentice to William Fuller 1688. Apprentices Benjamin Rouse 1698, Joseph Reckless 1702. In partnership with the widow of Francis Stamper in 1699. Died c.1714. Longcases and lantern clocks.
John Whitfield	Clifton Near Penrith	Born 1706. Worked at Clifton from c.1743 Disowned 1744. Died 1789.
Joseph Wilkinson 1	Wigton	Born 1710. Thought to have been apprentice to John Sanderson of Wigton c.1724. Died 1790.
William Wilkinson	Wigton Penrith	Born 1758, son of Joseph Wilkinson. Moved to Penrith c.1790, finally to Eamont Bridge c.1818. Died 1824.
Joseph Williamson 2	Penrith Eamont Bridge	Born 1788 son of William Wilkinson. Succeeded father of Eamont Bridge before moving to Annan in Scotland. Died 1855.

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## GLOSSARY

<b>Arbor:</b>	An axel on which is mounted a wheel or pinion (or other rotating part).
<b>Automaton:</b>	A clock with animated figures, usually located in the arch of the dial, triggered by the going, striking, musical, or repeating train.
<b>Balance:</b>	A horizontal wheel (usually iron) pushed alternatively backwards and forwards by the clock wheel train, regulating its speed.
<b>Bracket Clock:</b>	Spring driven clock normally displayed on a mantel piece, on furniture or a wall bracket.
<b>Crown Wheel:</b>	The escape wheel of a verge escapement, its teeth are parallel to its length.
<b>Crutch:</b>	A thin iron or steel rod attached to the escapement-pallet arbor, which connects it the pendulum.
<b>Escapement:</b>	That part of the movement, which controls the release of motive power.
<b>Anchor Escapement:</b>	A type of recoil escapement of anchor or lunette shape where the escape wheel recoils after the pallet has arrested the wheel tooth, mounted on a horizontal arbor in the same plane as the escape wheel; from one end of this the long pendulum receives its impulse through a crutch attached to the anchor arbor. Used on weight driven clocks after 1670.

<b>Deadbeat Escapement:</b>	An escapement whereby the escape wheel does not recoil, used in regulatory timepieces.
<b>Verge Escapement:</b>	Early form of escapement, in which two pallets at 90 degrees on the verge staff are pushed alternatively aside by the teeth of the crown wheel to impart oscillatory motion to a balance or pendulum.
<b>Foliot:</b>	The earliest type of regulator used in English clocks before c.1700. Consists of a horizontal bar placed across the top of an upright verge, toothed at each end which oscillates first one way then the other, small weights are attached each end and moved along for regulation.
<b>Fusee:</b>	A mainspring equalizer in the form of a spirally grooved truncated cone with the great wheel mounted upon it.
<b>Hoop &amp; Spike Clock:</b>	A posted frame 30-hour duration clock with an iron hoop, riveted to the top plate for hanging from a hook and iron spikes projecting from the back posts for stability.
<b>Lantern Clock:</b>	The 19 <sup>th</sup> century name given to a brass four posted short duration or 30-hour weight driven clock with decorative castings, variously described as Chamber, House or Balance clocks in the 17 <sup>th</sup> century.
<b>Pallet:</b>	The part of an escapement acting upon the teeth on a wheel.
<b>Passing Strike:</b>	A simple striking mechanism where the bell hammer is operated direct from the motion work (the gears which drive the hands).
<b>Remontoire:</b>	A devise (usually a spring) wound by the train and discharged at regular intervals, to secure a more constant force to the escapement.
<b>Ring &amp; Zig Zig:</b>	A pattern of radial dial engraving, comprising alternate concentric circles and free hand engraving in the form of zig zags or wrigglework, exclusive to the North Oxfordshire Quaker clockmakers of the 18 <sup>th</sup> century.

<b>Skeleton Clock:</b>	A mantle style spring clock where the frame is cut away in a decorative manner, exposing the movement, housed beneath a glass dome. Popular during the 19 <sup>th</sup> century.
<b>Train (Going):</b>	The set of wheels and pinions driven by a power source (weight or spring) regulated to rotate at a constant speed by an escapement.
<b>Train (Striking):</b>	The set of wheels and pinions driven by a power source, weight or spring, which when released by the motion work causes the hour to strike.