GLASSMAKING
THE GROWTH OF AN INDUSTRY

Doreen Hopwood

The ancient skill of glassmaking came to the West Midlands centuries ago, drawn by the availability of raw materials. It flourished, thanks to the efforts of inventors and industrialists, designers and patrons, skilled craftsmen and child labourers. By the nineteenth century a myriad of products, from domestic glassware to fine chandeliers and lenses for lighthouses were being distributed around the world from small domestic workshops and large manufactories; and the Black Country, particularly Stourbridge, had become synonymous with glassmaking.

Although the origins of glass are believed to date back to the fifteenth century BC in Egypt, its manufacture in Britain is comparatively recent. The first stained glass window was produced by craftsmen at Monkwearmouth Church, near Sunderland, who were brought from France in the late seventh century. From the thirteenth century there was a thriving glass industry in Kent, Sussex and Surrey due to the availability of sand, minerals and timber – all necessary for the manufacture of glass.

Forced out of France during the religious wars of the sixteenth century, glassworkers from Lorraine settled in Stourbridge where, in addition to the raw materials needed for glassmaking, there was an abundance of fireclay to make the pots for the furnaces. The first written evidence of glassworkers from Lorraine in the area is the baptism of John, son of Paul and Bridget Tyzack on 26 April in 1612.

Glassmakers at work in the hostile environment of the glass furnace. *Interior of the Richardson Glass Cone, Wordsley, c.* 1820 by Emily Hodgetts.

The Impact of Legislation

In 1615 a law was passed to protect forests and woodlands by forbidding the use of wood as a fuel for trades and manufactures. The obvious alternative was coal, and so glassmakers, who needed vast amounts of fuel for their furnaces, were forced to move to where supplies were plentiful. As a result, the centuries-old tradition of peripatetic glassmaking came to an end and the industry developed in Stourbridge, Newcastle upon Tyne and Nailsea, near Bristol. By 1688, there were 28 known glasshouses in Stourbridge.

The Glass Excise Act of 1745 levied a tax based on the weight of glass, rather than its value, so it became more economical for manufacturers to produce small, light articles.

At the Red House Glass Cone in Stourbridge, an excise officer oversaw the weighing of the glass as it came from the cooling kiln (lehr) into the room where articles were inspected (shrower) before being packed. No goods could be removed until the weighing had been completed, and the absence of an excise officer could delay the whole working process of the glasshouse, because the room could only be open in his presence.

Further legislation in 1777 imposed an additional duty on materials, and required glassmakers to take out an annual licence of £20 per glasshouse. The levies were not in force in Ireland, so two brothers, William and George Penrose, took advantage of this (and the 1780 Free Trade Act) to establish glassworks at Waterford. Neither had any experience of glass manufacture, so employed John Hill of Stourbridge to head 60 skilled artisans, receiving a subsidy of £10,000 from the Irish Parliament.

Import and export duties in 1825 helped to force the closure of the Waterford factory (not to be re-opened until a century later). The Glass Excise Act was finally repealed in 1845 and this, along with improved production methods, brought about a huge growth in the industry.

The Development of Sheet Glass

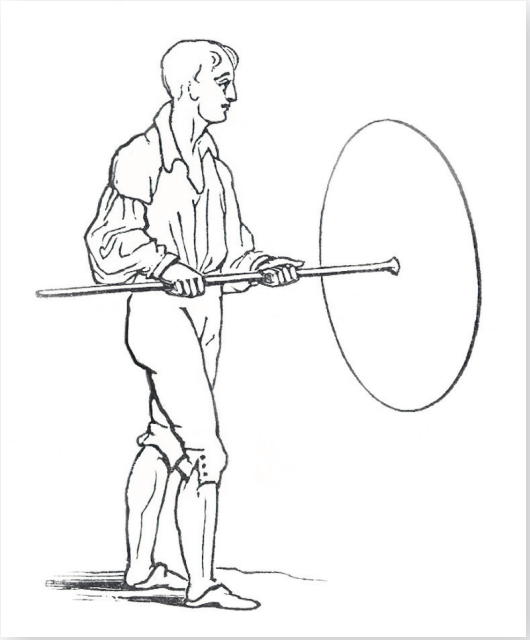
Robert Lucas Chance (1782-1865) established his works at Spon Lane in Smethwick in 1824, after purchasing the British Crown Glassworks, and together with John Hartley, he developed an improved process for making cylinder sheet glass. Prior to this, crown glass, made by blowing a sphere of glass and then spinning it whilst still molten into a circular sheet, had been used for windows. This limited its size, so windows comprised many panes. The new process involved swinging a large bubble of glass to elongate it into a cylindrical shape which could be cut lengthways and then flattened.

John Hartley died soon after the improved process had been developed, and his sons moved to Sunderland to set up their own glassworks. By the mid-nineteenth century, Chance Brothers and Hartleys were two of the main window glass manufacturers in the country.

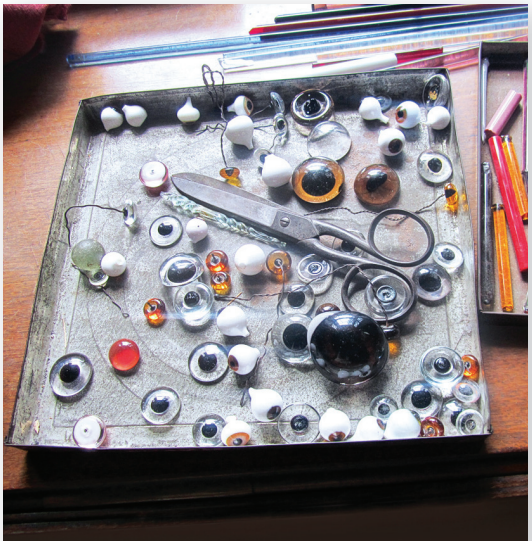
Glass Manufactories

Depending upon the type of glass and goods being made, glassmaking could be carried out on a domestic basis, so small glass manufactories (cribs) sprang up; but the manufacture of sheet glass, bottles and decorative pieces needed a large glassworks with numerous workers.

Initially, glass manufactories (or glasshouses) consisted of a single cone-shaped structure, which was both chimney and workshop, in which a strong up-draught was created to maintain the high temperatures required. The upper part of the furnace consisted of a low, shallow-domed chamber with the clay pots, in which the glass was melted, arranged in a circle.



Molten glass was spun to form crown glass. *Crown Glass Cutter & Glazier's Manual*, William Cooper (1835).



For sixty years, Herbert Oldfield worked from the front room of his home in Birmingham where he was variously described as a glass cutter, glass blower, glass bead maker and glass toy maker. The latter included artificial eyes, which required few tools but great dexterity.

A reporter in the *Midland Illustrated News* in 1869 testified that he was unable to distinguish between the "one-to-match" artificial eye of a wearer and his natural one. Glass eyes were also in demand by taxidermists for their stuffed animals and for porcelain dolls.

Picture used with permission of the National Trust
www.nationaltrust.org.uk/birmingham-back-to-backs

Optics for the Souter Lighthouse on Tyneside were made by Chance Brothers.

Midland glassmakers were involved in the production of mirrors, spectacles and scientific equipment, including the lenses for lighthouses - in spite of being located as far away from the coast as is possible to be in England. In 1865, Chance Brothers Lighthouse Branch covered over an acre and a half and employed about a hundred men.

Glassmakers worked in teams of four, called a chair, within which there was a strict hierarchy and their job titles are derived from the processes used in wine glass making. The gaffer (or chairman) sat at a bench which had two long upwardly curving arms on which the blowing iron was rolled to shape the item being made. He was assisted by a servitor who made the bowl of the wine glass, a footmaker who prepared the stems and feet and a taker-in (often a young boy) who took the finished goods to the annealing chamber. Strictly speaking, the taker-in was not a glassmaker, but the other three men in the chair could not have completed their work without him – running errands, looking after the blowing irons and generally fetching and carrying. On average, a chair could produce 160 plain wine glasses in a turn (a shift of about six hours), or 80 of the best kind. Each chair generally worked eight turns a week.

In addition to the glasshouse, where the glass was produced and shaped, there were several other buildings, including grinding and cutting shops where articles were embellished. Most also had direct access to rail and canal networks for the transportation of raw materials and finished goods. By the mid-nineteenth century, glassworks often covered a large area. After the author Charles Dickens (1812-1870) had visited the Chance Brothers' manufactory he described its size: 'Visitors may pass hither and thither for four or five hours without entering the same place twice.' (*Household Words*, March 1852)

The traveller and writer Elihu Burritt chose poetic terms for the same complex of buildings: 'If seen by moonlight, when quiet and smokeless, they might look to an imaginative eye like a great nest of cathedrals and Turkish mosques… but when all a glow with its fiery industries, it presents a scene which Virgil and Dante would have described.' (*Walks in the Black Country and Its Green Borderland*, 1868).

From Conservatory to Crystal Palace

The development of sheet glass allowed Joseph Paxton (1803-1865) to create his great conservatory and glasshouses at Chatsworth. These formed the blueprint for the Crystal Palace, built to house the Great Exhibition of 1851, and Chance Brothers were engaged to glaze the whole structure.

By using an ingenious trolley system, eighty men were able to fit over 18,000 panes (each 10 inches by 49 inches) covering 63,000 square feet in just a week. The centrepiece of the exhibition was the crystal fountain produced by F & C Osler of Birmingham, which weighed over four tons and stood 27 feet high. The exhibition catalogue declared that no other piece of glasswork had involved such treatment in 'casting, cutting and polishing of blocks of glass of a size so large and of a purity so faultless.'

Glass Workers

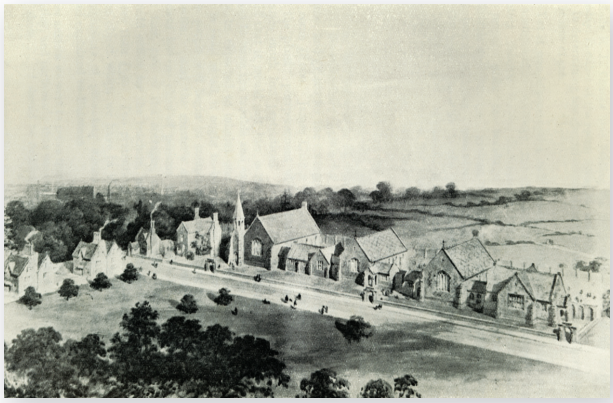
It was estimated that there were about a thousand flint glass makers in England and Wales in 1851 when the census was taken, about a quarter of whom were in the West Midlands. In 1861, Chance Brothers alone were employing over a thousand workers.

In glassmaking areas, workers may appear on censuses or in directories according to their specific role within the industry. The gatherer prepared the initial glass bubble by taking a lump (gob) of molten glass onto his blowing iron and then blowing into it until the correct size was achieved. The air supply to the resultant bubble was then closed, and this action is believed to have brought about the expression "shut your gob". The glassblower then heated and reheated the glass to achieve the desired shape and size. A glass toy maker was responsible for producing a variety of goods, including perfume

NUMBERS OF WORKERS IN THE SIX STOURBRIDGE GLASSWORKS IN 1861

Company	Men	Boys	Women	Total
John Davis	69	16	9	94
William Richardson	70	16	6	92
John Renald	51	25	-	76
Frederic Stuart	50	13	9	72
Edward Webb	30	8	-	38

The wage books of Stevens & Williams of Stourbridge (later Royal Brierley Crystal) indicate the average level of weekly wages paid to each member of a chair in the mid-nineteenth century. The gaffer received the most at 34s. 1d, the servitor received 21s.11d, whilst the footmaker and taker-in earned 7s.10d and 4s. 3d respectively.



Spon Lane Schools, Smethwick, opened by Chance Brothers. *A History of the Firm of Chance Brothers and Co. Glass and Alkali Manufacturers*, James Frederick Chance (Spottiswoode, Ballantyne and Co Ltd, 1919).

bottles, trinket boxes, buttons and beads, and often worked in close association with the brass trade, as at manufactories such as Osler's where chandeliers and other decorative lights were made.

Working conditions, especially the temperatures which glassworkers had to endure, were detrimental to health. The temperature at the mouth of a furnace was over 200 degrees Fahrenheit, and between 80 and 196 degrees where the takers-in stood. Large quantities of beer were consumed, and the fetching and carrying of this, as well as going back and forth between furnaces meant that the taker-in could easily clock up some thirty miles a day. The heat and brightness of the furnaces caused eye problems, and the physical strength needed by glassblowers, both for the actual production of the glass and holding its weight on the blowing pipe, resulted in respiratory disorders and chronic back pain.

The Flint Glass Workers Union (founded in the 1840s) and the Glass Cutters Union were powerful associations of highly skilled workers who were able to lobby for better conditions. During times of depression in the trade, they maintained unemployed members and set up 'Tramp Societies', by which any member who left home in search of work was paid a penny a mile, and then received free board and lodging when he reached an area where there were other union members.

Competition from the continent and cheaper pressed glassware meant that many West Midlands flint glassworks turned from the manufacture of glass to glass cutting only, and the decline in the trade is reflected in the amounts of unemployment payments made by the unions. These were just £316 in 1875/6 but had risen to £1,879 in 1878/9.

Sons often followed their fathers into the glass trade, and in the 1860s, George Lloyd, a Birmingham glassmaker, boasted of having members of successive generations of the same family in his employ, whose ages ranged from ten to seventy-five years.

An educated workforce was a definite asset, and Chance Brothers opened their school at Smethwick for workers and their children in 1845, with the mission statement of 'Fear God, Tell the Truth and Don't be Afraid of Work'. Standards were obviously high, as in 1850, the Staffordshire School Inspector commented on the 'easy ascendancy' the schoolmaster maintained over almost 200 boys in one room.

Surviving Structures and Archives

Like other structures subjected to intense heat, glasshouse cones were often built and rebuilt, rendering them liable to collapse. There are just four remaining intact glasshouse cones in the UK today – the Red House at Stourbridge, the Catliffe glass cone near Sheffield, the Lemington near Newcastle on Tyne and at Alloa in Scotland.

Even though the buildings and companies no longer exist, their records have often survived and can generally be located at county or local record offices. They may include accounts, minute books, correspondence, designs, catalogues of goods, photographs and possibly wage books, but the amount of material varies from one company to another.

You can find out what is available and where the records are deposited by searching the National Register of Archives at www.nationalarchives.gov.uk/nra ●

Doreen Hopwood was formerly the genealogist for Birmingham City Council and is a regular contributor to family history publications.

Further Reading

Samuel Timmins (ed.), *The Resources, Products and Industrial History of Birmingham and the Midland Hardware District* (Robert Hardwicke, 1866).

Elihu Burritt, *Walks in the Black Country and its Green Borderland* (1868), (Roundwood Press, 1976).

Charles Dickens, *Household Words, March 1852 (pp33-37)*

Jason Ellis, *Glassmakers of Stourbridge and Dudley 1612-2002* (Xlibris Corporation, 2003).

www.nationaltrust.org.uk, Birmingham Back to Backs – visit Herbert Oldfield's home at Court 15 Inge Street.

www.gorgeousglass.org.uk

The Crystal Palace, glazed by Chance Brothers. *Crystal Palace*, engraved by A Le Blond (1819-94).

In 1836, approximately 7,000 square feet of plate glass was being produced weekly, and this rose to 14,000 square feet by 1860. The cost had also greatly reduced – from about £60 per 40 inch x 50 inch sheet in 1771 to £5 in 1865.

Next time you have a pint, spare a thought for the humble beer bottle, which was first produced by machine in the late nineteenth century. The marble-stoppered bottle was invented by Hiram Codd in the 1870s and contained the cheapest of beers which were known as "wallop". From this came the term "codswallop" for anything of no value.