INTRODUCTION

The Argory, with its complete acetylene gas installation and light fittings, is an exceptionally rare survivor of a form of domestic lighting that enjoyed a period of popularity from the last decade of the nineteenth century until the late 1920s. In this respect the house is one of the most interesting and important of all the properties in the care of the National Trust as it provides visitors and researchers with an opportunity to see a range of historic light fittings and a lighting installation that have remained undisturbed. The National Trust is to be congratulated on its perspicacity in not bowing to pressure and the expectations of modern-day life by preserving the fittings in their original state, and not having them converted to electricity.

The Argory also has impressive Argand lamp chandeliers that were installed when the house was first built in 1824. These were adapted to acetylene gas fittings when Captain Ralph Shelton decided to have acetylene lighting installed in his home in 1906. Captain Shelton’s decision to have historic light fittings converted to what was then an up-to-date form of lighting was in line with many of his counterparts who, when their homes first had gas or electric lighting, had their period fittings converted to the latest technology.

HISTORICAL CONTEXT OF THE LIGHTING AT THE ARGORY

Technological Advances in Lighting

At the end of the eighteenth century domestic lighting had undergone a significant transformation with the invention of the Argand lamp in 1783 that produced light equivalent to ten wax candles. This invention presaged the major developments in gas and electric lighting that were made during the nineteenth century. Until the invention of the Argand lamp no important inventions had been made since Roman times to improve exterior or interior lighting; with homes continuing to be lit primarily by firelight that was supplemented by the use of rushlights, candles and spouted oil lamps. With the exception of rushlights, which could be made at home by those in rural areas or bought very cheaply by those living in towns, all artificial lighting was expensive. The use of beeswax candles and, after 1750, spermaceti wax candles (a wax and oil retrieved from the head matter of sperm whales), together with lamps fuelled with superior oils, indicated the prosperity of the householder. In far less wealthy homes cheaper tallow candles made from rendered animal fat, and oil lamps fuelled with fish and inferior whale oils would be used. The cheapest of these produced evil odours and black greasy smoke.

Candles

In the early nineteenth century improvements were made in the manufacture and production of candles. In 1820 Cambacèrés found that a plaited wick resulted in a snuffless candle, as the wick bent into the flame and was fully consumed. With this discovery candles made with plaited wicks did not require snuffing, and this meant candle snuffers could be dispensed with. Also at this time a new improved candle made of stearine, a constituent of tallow, was introduced. Edward Price & Co., later Price's Patent Candle Company, further improved the stearine candle by using a composite of refined tallow and coconut oil with the result that these ‘composition’ candles, which were hard and pure white, produced a bright flame without smell or smoke and furthermore were ‘snuffless’.

Cover picture ‘Surprise’ pendant in Captain Shelton’s bedroom

Above Candle making: Top: Tallow candles being dipped and made in moulds Centre: Making wax tapers Bottom: Wax candles being dipped and hand rolled (From Candlesticks, Wills, 1974)

Left Price’s advertisement for Palmitine candles (From Price’s Patent Candle Company Ltd)
After 1870 an improved hard white candle made from paraffin wax was developed. These candles were made with a glossy surface that rivalled other wax candles in appearance and as they burned with a bright light offered all the advantages at a fraction of the cost. At the end of the nineteenth century 90 per cent of all candles produced were made of paraffin wax.

Until the nineteenth century candle making had been a labour-intensive craft that was reflected in the cost of candles. By the mid-nineteenth century inventions in mechanised production had resulted in candles becoming a cheap commodity.

**Argand Lamps**
The Argand lamp was first patented in France by Ami Argand in 1783 and was described in his English patent application as, ‘a lamp that is so constructed to produce neither smoke nor smell and to give considerably more light than any lamp hitherto known’.

The Argand lamp had a wide circular wick and the central draught assisted combustion by aerating the flame. It was soon discovered that with the use of a glass chimney illumination was increased. The lamp produced light equal to that of ten wax candles, 10 candle power (c.p.), and in comparison to candles and spouted oil lamps the light from Argand lamps was considered ‘glaring’.

Although it was found that ‘any tolerable oil’ could be used to fuel Argand lamps, spermaceti oil became favoured, as it produced a bright flame and no smell; it became extremely expensive, as demand outstripped supply. By 1788 the demand for spermaceti oil had created a shortage and colza oil, extracted from rape seed, was a quality alternative, being slow to deteriorate and producing a clear, bright, smokeless flame. When Walter McGeough set about furnishing The Argory in 1824, he chose Argand lamps to light the house, and some splendid examples remain in the collection, although they were converted to acetylene gas lighting in the early twentieth century.

**Paraffin Lamps**
After 1860 the use of candles and oil lamps became more widespread, primarily due to the discovery of abundant supplies of mineral oil in America in 1859. With this discovery, oil costs decreased rapidly, and paraffin lamps and paraffin wax candles were to be seen in the majority of homes and became the most widely used form of domestic lighting until the 1890s. Paraffin oil lamps were initially fitted with a single wick, but in 1865 Hinks invented the Duplex burner that had two parallel wicks and produced illumination equivalent to 30 c.p. which is approximately 40 watts.

Throughout the last decades of the nineteenth century numerous lamp patents were taken out to improve the illumination, economy and safety of paraffin lamps. Many lamp developments concentrated on improving air flow to increase combustion and therefore illuminating capability, and central draught lamps, whose technology derives from the Argand lamp, succeeded. These lamps were fitted with air diffusers or spreaders and, although some claimed illumination output of up to 200 c.p., those mostly used in the home provided up to 50 c.p. or 60 watts. In the late 1890s the incandescent mantle, which was originally developed for gas lighting by Welsbach, was used with oil lamps and illumination output rose to 80–100 c.p. and it was possible to convert Duplex lamps by changing the burner.

In isolated properties and rural communities where mains services did not become available for many years, paraffin lamps and candles remained in use well into the twentieth century.
Gas Lighting
When The Argory was completed in 1824, gas lighting was already becoming increasingly widespread in cities and major towns in the United Kingdom. Gas was first commercially manufactured in 1812 when a Royal Charter was granted to the Gas Light & Coke Company to light the most densely populated areas of London. For many years gas was very expensive and was used mainly to light major thoroughfares in towns. Other customers were theatres, factories, shops and pubs. Gas lighting made slow progress into the homes of domestic consumers, and its use only began to increase as gas prices decreased in the 1830s.

The first recorded use of gas in Northern Ireland was in 1810 in the factory of Messers McCrum, Lepper & Co., Belfast. In 1821 John and George Barlow of London signed a contract with the police committee to provide gas lighting in the main streets of Belfast, with ‘gas light to be equal to that supplied to the public lamps in London and to be three times greater in brightness than the oil light now existing in said town of Belfast’. The next year construction began on the gasworks in Ormeau Road. In 1823 the Gas Works Bill passed through Parliament and Belfast Gaslight Company obtained statutory powers to produce and distribute coal gas. Although the gasworks started as a private enterprise it was taken over by the Belfast Corporation in 1874.

Electric Lighting
Electric lighting in the home became possible when the first commercially viable incandescent carbon filament lamp was introduced in 1881. However, electricity supply stations were few and far between, as only very wealthy people could afford electricity and they usually had to purchase their own generators. In Northern Ireland Larne became the first town to have electricity in 1892, when the Larne Electric Light & Power Company installed two small AC generators turned by belts from two steam engines. Once transformed this gave a supply of 100 cycles at 110 volts and at first was used to power 14 street lamps and lighting in a few houses. At The Argory it is only in recent years that electricity has been partially installed.
Introduction
The Argory was built in 1824 and until 1906 it was lit by firelight, oil lamps and candles. The design of the Argand fittings that have survived suggests that they were installed when the house was first built and it is highly likely that other Argand fittings (for example, bracket lamps, single-arm lamps and double-arm pillar lamps) were also used to light passageways and principal rooms in the house. In 1906 Captain Shelton decided to light his home with acetylene gas lighting which was both more efficient and cheaper than having either a gas works that produced coal-gas or an electricity installation. What is particularly remarkable about the acetylene fittings is that many of the original glass shades are unbroken, and this is a testimony to the care and diligence of the servants who tended the fittings.

A great disadvantage of gas lighting compared to other forms of lighting was that fittings generally had to be in fixed positions. Nevertheless, very soon after gas lighting was first introduced, developments were made to give otherwise fixed fittings some manoeuvrability, for example, swing brackets, table lamps with flexible tubing, water and cork slide gasoliers and directionally versatile ‘Surprise’ pendants. A number of these ingenious inventions can be seen in the house and it is with fittings such as these that makes the collection at The Argory unique.

The West Hall and Organ Lobby

Argand Chandeliers
In the West Hall stairwell a bronze four-arm Argand lamp chandelier is suspended below a three-arm Argand lamp chandelier. Originally the lower chandelier was suspended by a highly decorative chain from the chandelier above, and this chain can now be seen wrapped around the iron barley-twist pipe that acts as a sleeve for the acetylene gas pipe.

This particular design of chandelier was very popular in the 1820s, and a number of chandeliers of the same design can be seen at several National Trust properties, for example, Arlington Court, Devon, Dunham Massey and Tatton Park, both in Cheshire. If the chandeliers were in use every night, the oil reservoir at the centre of the fitting would need to be replenished daily. Filling, cleaning and maintaining the chandeliers would have been a daunting task, particularly the upper chandelier in the Stairwell. Another three-arm Argand lamp chandelier can be seen in the Organ Lobby.

Expensive fittings such as these chandeliers were rarely discarded and instead were adapted for progressive technologies, and it is possible that in the 1860s the Argand lamps on the chandelier were removed and replaced with paraffin lamps, which were easier to maintain and produced more light than Argand lamps. The fittings were converted to acetylene gas lighting in 1906 and it was fortunate that in this process the oil reservoirs were not removed, as is so often the case. The lamps on the arms were replaced by acetylene gas burners and on all the chandelier arms can be seen lever taps for turning the gas on and off. A device for lighting the gas burners on the chandeliers can also be seen.

Candelabra
In the West Hall is a fine pair of six-branch bronze and ormolu Regency candelabra that date from around 1815. These were brought to The Argory from Drumsill in 1917, when the property was sold by Sir Walter MacGeough Bond. The fittings have been converted to electricity, which suggests that electricity was installed at Drumsill, and are shown with their original electrical wiring. They were never used as lighting at The Argory.
The Drawing Room

Gasolier and Brackets
Unlike the light fittings in some other rooms, the acetylene gas fittings in the Drawing Room are not in an Art Nouveau style, which in 1906 was going out of fashion. The Drawing Room has a six-arm chandelier, and there are four matching two-arm wall brackets which are best described as being in an historical style, the design being a pastiche of Regency motifs. The historical illusion is continued as the ‘candles’ in the ‘candle sockets’ are elongated acetylene gas burners with opal glass sleeves that were made to appear as if they were wax candles. The shades of pink silk and glass-bead drops are extremely delicate; they could be raised or lowered by using clips on the candle sleeves.

Taperstick
On the desk is a silver inkstand which has a taperstick with a dousing cone (extinguisher) at its centre. The basic components of an inkstand changed hardly at all between the seventeenth and nineteenth centuries, having receptacles for a quill or pen, ink, and a pounce pot containing chalk or fine alum to dry the ink. Before envelopes were introduced in the mid-nineteenth century, letters were folded and sealed with wax melted with a taper (small candle).

The Study

Gasolier
The gasolier has decorative brass scroll ornamentation and elaborate shade galleries. If this fitting were used in a house with coal-gas, it was designed to be fitted with upright incandescent gas mantles and burners. The gasolier has cranberry-edged etched-glass vaseline shades, although one shade appears to be a replacement, as it does not have vaseline-coloured glass.
Gas Bracket
A brass double-swing bracket is on the wall near the desk. Swing brackets gave an otherwise fixed fitting directional versatility in the horizontal plane, which was useful in getting the light to where it was needed.

Gas Table Lamp
A height-adjustable table lamp has a green glass shade with white inner surface that reflected light downward. The same design of shade is used on a height-adjustable paraffin lamp in the Upper North Corridor. The table lamp was, within limits, moveable, as there is a flexible tube connection to a gas point.

Candlesticks
On the mantelshelf is a pair of ormolu Regency candlesticks that have detachable glass drip pans. It is possible the candlesticks were brought from Drumstil, as they pre-date the building of The Argory and are of the same period as the c.1815 candelabra in the West Hall.

Spring-loaded Candlestick
A handsome and very large bronze and gilded candlestick has a spring-loaded mechanism and dates from around 1830–40. The fitting is currently missing its glass shade and gallery. At a time when house fires were frequently caused by oil lamps being knocked over and candles becoming dislodged, a simple and efficient mechanism to keep a candle in a fixed position and the flame at a constant height was developed at the beginning of the nineteenth century. This new design of candle fitting where the candle was not exposed to view, it being contained within the stick, used a spring mechanism by which the upward pressure of a coiled spring pressed the candle against a partially enclosed top opening. The candlestick is marked R.B. 25543 and may have been made by Richard Bright of London.

Wax Jack
On the desk is a brass wax jack that still retains the majority of its red wax taper; it probably dates from the early nineteenth century. Wax jacks are thought to date from the late seventeenth century and performed the same function as tapersticks in that they were used to melt wax to seal letters.

Taperstick
Also on the desk is an inkstand that has a silver-coloured taperstick.

Spill Vase
A horn spill vase on the mantelshelf is presented with rolled-paper spills and is a reminder of how candles, oil lamps and fires were lit before matches were introduced.

Palmer’s Patent Spring Loaded Candlesticks
A pair of large bronze candlesticks are very early examples of spring-loaded candlesticks which were patented by William Palmer in 1830. The candlesticks have a makers plate marked ‘Palmer & Co. Patent’ that also bears a Coat of Arms and would have been very expensive when purchased. According to Bacot, ‘large candles were especially made with three wicks composed of woven wire and cotton’. These were known as metallic wicks and produced greater illumination than an ordinary candle. Palmer’s invention was immensely successful, and smaller much cheaper spring-loaded candle fittings continued in production throughout the nineteenth and into the twentieth centuries.
The Central and Upper Corridors

The Corridors are lit by ‘harp’ pendant lamps of Art Nouveau design that have highly decorative etched-glass shades. The small metal smoke bells above the gas burner were superfluous, as, unlike flat-flame burners used with coal-gas, acetylene lighting did not give off smoke that blackened ceilings. The fittings were probably made for use with upright incandescent gas mantles and burners but have been adapted for use with acetylene gas.

The East Porch

The East Porch, which was added to the house around 1834, is lit by a lantern of Arts and Crafts design. The lantern has retained its on/off lever and chains but not its cylindrical glass shade.

The Billiard Room

Billiard Table Light

The six-light brass billiard table fitting has cardboard shades that are replacements for the original shades. It was usual for billiard light shades to be coloured dark green on the outer surface, as this was considered a ‘restful’ colour, and the inner surface white, which helped reflect the light downward. The billiard table was well lit, as each light is fitted with Brays ‘Elta’ double burners.

Gas Brackets

The brackets were probably manufactured by the Welsbach Incandescent Gas Light Company, who in 1900 produced fittings which they claimed to have ‘the appearance of an electrolier’. Gas lighting, because of the heat generated, could not use fully enclosed shades, unlike the shades used for electric lighting. The shades on the brackets, which appear at first glance to be shades for electric lamps, are punctured with air holes to prevent the shade from cracking. The fitting was intended to be used with upright incandescent gas mantles and burners.

The Servery

A stiff-arm gas bracket with a shade is lit by an electric lamp that produces an equivalent amount of light to that given by an acetylene-gas burner.
The Dining Room

Gasolier
The gasolier in the Dining Room is either a water-slide or cork-slide gasolier and is a very rare survivor, being of a design that dates from the early years of the twentieth century. These gasoliers were generally used over dining tables and were first introduced in the late 1820s. Water-slide gasoliers are a telescopic fitting with a water seal that prevented gas from escaping. As the fitting could be extended vertically by a few inches, light could be brought downwards to illuminate a surface and, provided that it was of sturdy construction and regularly maintained, it was safe to use. Cork-slide gasoliers worked on the same principle, but were considered dangerous, as the cork seal rotted with use and allowed gas to escape. Nonetheless, by the end of the nineteenth century these fittings were mostly regarded as obsolete and dangerous, and even the gas press advised against their use. For example, in an article entitled ‘Dangerous Gas Fittings’ in the Journal of Gas Lighting (1900), it was stated:

As everyone knows, the principle of this ‘chandelier’ is that of a water seal, which, of course, fails when there is no water in it. Few people remember to replace the water, which easily evaporates in a warm atmosphere. Even supposing, however, that there is water in the sliding tube, the chains supporting the weights which keep the pendant in position may easily get defective; and thus the bracket may drop below the water seal, and the gas be allowed to escape. This is probably what happened in Birmingham last week ... It was shown that a water slide pendant had become defective owing, not for want of water in the tube, but to flimsy chain fittings. Those defects accounted for the death of a man and very nearly that of his wife. Both had retired to bed in good health; but before morning were poisoned with escaping coal gas, which doubtless they had inhaled through most of the night ...

**The copper gasolier is of a quasi-Arts and Crafts design and has two burners that are fitted with white shades to screen the eyes from the bright light produced by the acetylene burners. Again on this fitting the smoke shades are superfluous.**

Problems with the gasolier might soon have been noticed, as water-slide gasoliers were potentially dangerous when used with acetylene gas and it may have been used in a fixed position. Morrison, a writer on acetylene gas generation, noted, ‘Water-slide chandeliers may not be used, for, as will be learned, the gas pressure with acetylene is too high for water-sealed fittings to be used in the ordinary way’.  

Gas Brackets
The pair of copper bracket fittings are of a similar design to the gasolier, being more in the style of Art Nouveau than Arts and Crafts. The white glassware on the fittings is complete.

‘Princess’ Paraffin Peg Lamps
The silver candlesticks in the Dining Room are of mid-eighteenth century design and have been converted to small paraffin lamps by the simple expedient of placing ‘Princess’ peg lamps in the candle sockets. The lamps, which date from the late nineteenth century, have ribbed cranberry and opal glass shades and founts and are marked Zimmermann & Co. By converting a candlestick whose candle produced 1 c.p. with a peg lamp that produced 10 c.p., the householder enjoyed ten times the amount of illumination from one fitting.

Below left Dining Room Gasolier  
Below A silver candlestick fitted with a ‘Princess’ paraffin peg lamp
Captain Shelton's Bedroom

'Surprise' pendants
In many rooms on the first floor can be found 'Surprise' pendants, and perhaps two of the finest are in this bedroom. One is positioned on a wall bracket over the bed and the other is suspended from the ceiling between the windows. In the latter position one expects that the pendant was intended to illuminate a dressing table or desk. Although popular at the end of the nineteenth century, many 'Surprise' pendants were scrapped when homes had electricity installed, by which time they had begun to look singularly old-fashioned.

Another 'Surprise' pendant is in Captain Shelton's Dressing Room and others are in the Maid's Bedroom and Tommy's Bedroom.

The 'Surprise' pendant was invented in 1893 by R.H. Best, a Birmingham manufacturer of brass light fittings. The gas pendant offered full rotation in both the vertical and horizontal planes. It incorporated a central swivel and 'its construction enables it to be balanced in ANY position, and to be moved with finger touch. It swings round in a 3ft circle; measures 3ft. 6in. from ceiling plate when up, and 7ft. 10in. when down'.

The success of the fitting was assured when the Prince of Wales, later King Edward VII, had 'Surprise' pendants installed at Sandringham.

The Bathroom
The stiff-arm gas bracket in this room is of a design that dates back to the mid-nineteenth century, but it was still possible in the early twentieth century to buy gas fittings whose designs were fashionable in an earlier period.

The Cedar Bedroom
Gas Table Lamp
A pair of large silver plated table lamps on the dressing table have gas 'candles' inserted in the candle 'sockets'. The lamps were connected to a two-point gas outlet behind the dressing table, using rubber pipes.

Gas Bracket
A fancy double-swing gas bracket is complete with its original shade.

Candlesticks
On the mantelshelf are a pair of Aynsley white china candlesticks with detachable glass drip- pans.

Candle Table
A mid- to late nineteenth-century small table with a candle socket at its centre was probably useful when sewing or reading.
Lady Bond’s Bedroom

Gas Fittings
This bedroom also has a pair of gas ‘candlestick’ table lamps on a dressing table and a double-swing gas bracket is of the same design as that in the Cedar Bedroom.

Candle Fittings
On the mantelshelf are a pair of c.1860 English New Stone white candlesticks with blue and gold decoration that have matching dousing cones on ceramic trays.

Upper North Corridor

Paraffin Lamp
The elegant height-adjustable brass paraffin lamp is marked Lambert, Biren & Co. Ltd and it is fitted with a Hinks Patent Duplex burner. The lamp has its original green-glass shade that has a white glass interior which reflected light downwards. Before acetylene gas was introduced into the house, the lamp was probably placed on the desk in the Study, where there is a gas table lamp fitted with an identical shade.

Porte Cochère in Coach Yard

The glazed square-bracket lantern under the glass carriage shelter was probably originally lit by an oil lamp rather than a candle and dates from the nineteenth century.

Bullock Yard

Here are two glazed green-painted flat-backed iron lanterns, which were also probably lit by oil lamps.

Acetylene House

In the Acetylene House the visitor can see the original Sunbeam acetylene generator, which is in an excellent state of preservation.

Acetylene Gas Lighting
It was discovered that calcium oxide (quicklime) produced a bright light when heated by an oxyhydrogen flame, and in the 1830s it was used to light the stage in theatres, and became known as ‘limelight’. A gas considered to give a similar quality of bright light was acetylene – by exposing calcium carbide to

Below Acetylene gas generator or plant
water, acetylene gas was released. Although this was first produced experimentally in the same period, it was not until 1892 that a commercial process for manufacturing calcium carbide was developed, and within a very few years acetylene-gas-generating plant was being sold. Lighting by acetylene was considered ideal for country-house owners, as it provided a cheap and relatively trouble-free system of illumination, provided it was installed by specialist firms and certain precautions were taken.

Acetylene was more explosive than coal-gas, and the plant needed to be located away from the property in an enclosed, dry space. As the system needed little maintenance, it could be left to the charge of 'the most unskilled of attendants'. Acetylene light was brilliant white and there were no harmful by-products of combustion to vitiate the atmosphere or soots to dirty furnishings and decorations and it was probably for these good reasons that the lighting had some success. The 'Elta' gas burners used on fittings at The Argory were made by George Bray, one of the leading gas burner manufacturers in the mid- to late nineteenth century.

Acetylene gas lighting was installed at The Argory in 1906 and cost around £250 and was used to light principal rooms, family bedrooms and the domestic offices. The bedrooms of the higher-ranking servants at The Argory, located on the first-floor corridor, had acetylene lighting. However, in their sleeping quarters in the Garret the servants continued to use paraffin lamps and candles. The installation continued in partial use until 1983, when it was one of only two properties in the British Isles still using acetylene gas. Although the National Trust had wanted the house to continue to be lit by acetylene, it was considered this would involve unacceptable risks, and the project was abandoned. Acetylene gas is highly inflammable, and can leave deposits in old pipework that is explosive, so it is not without inherent dangers. Although there is now an electricity supply to the house, the acetylene gas fittings have been left in their original condition.

Above right Acetylene gas generator

Right Carbon filament lamp
Bibliography


Best, R.D. *Brass Chandelier a Biography of R.H. Best of Birmingham* by his son R.D. Best, with an Introduction by P. Sargent Florence, George Allen & Unwin Ltd, 1940

Chandler, D. *Lighting by Gas, an Outline of its History*, Chancery Lane Printing Works, 1936

Dillon, M. *Artificial Sunshine, a Social History of Domestic Lighting*, National Trust, 2002

Lewes, V.B. *Acetylene, a Handbook for the Student and Manufacturer*, Constable & Co., 1900


Illustrations

Best & Lloyd p.9 (below left); Bray's Catalogue p.7 (above right); C. Davidson *The Book of the Home*, 1900, Vol. 2, p.11 (above), Edison and Swan, c.1930 p.11 (below); Wills pl (below); © M. Dillon pp.6 (above right), 7 (above right); National Trust pp.4 (below), 6 (above), 7 (below, left), 8 (right), 9 (above right and below right), 10 (left);

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