

Historic cut glass chandeliers: Recording and conservation

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Abstract

The preparations involved in recording and conserving glass chandeliers are described, followed by the procedures for examination, dismantling, cleaning and recording. Since terms for describing chandelier components are variable, a glossary is included to aid clarification.

Introduction

There are few published conservation articles which describe the treatment of historic glass chandeliers. Past and present treatment seems to have consisted of dismantling and cleaning, replacing missing metal and glass sections and repinning the lustres which form pendants and chains. Cleaning of historic chandeliers is often undertaken by commercial firms using proprietary solutions and abrasives, the contents of which are largely unknown. There appears to have been no attempt to produce detailed comprehensive documentary records for general guidance.

The involvement of The Conservation Studio with historic glass chandeliers *in situ* began in 1986, as a result of a move by the Corporation of London to employ conservators in surveying the fabric and contents of the Mansion House, the Lord Mayor of London's official residence. The survey was undertaken in preparation for the major refurbishment of the building. It was believed that this may have been the first time that documentation of the technology and condition of chandeliers had been undertaken in an organised way; thus the recording involved the identification of the information required and the design of recording forms and the production of plans and elevations (Figs 1 and 2).

Historical research

Again, there are few publications concerned with the historical development of chandeliers. Determining their age can be complicated by the fact that they may have begun life as gasoliers and were converted to electroliers; and that parts of the chandeliers, especially the ornamentation, were often changed as fashion dictated. It may be possible to obtain particulars of orders and invoices for purchases and cleaning, if records exist with the owner, or in a local library, museum or County Record Office.

Another difficulty arises from the use of terms to describe chandeliers. The general use of the term chandelier for a hanging light is comparatively modern.

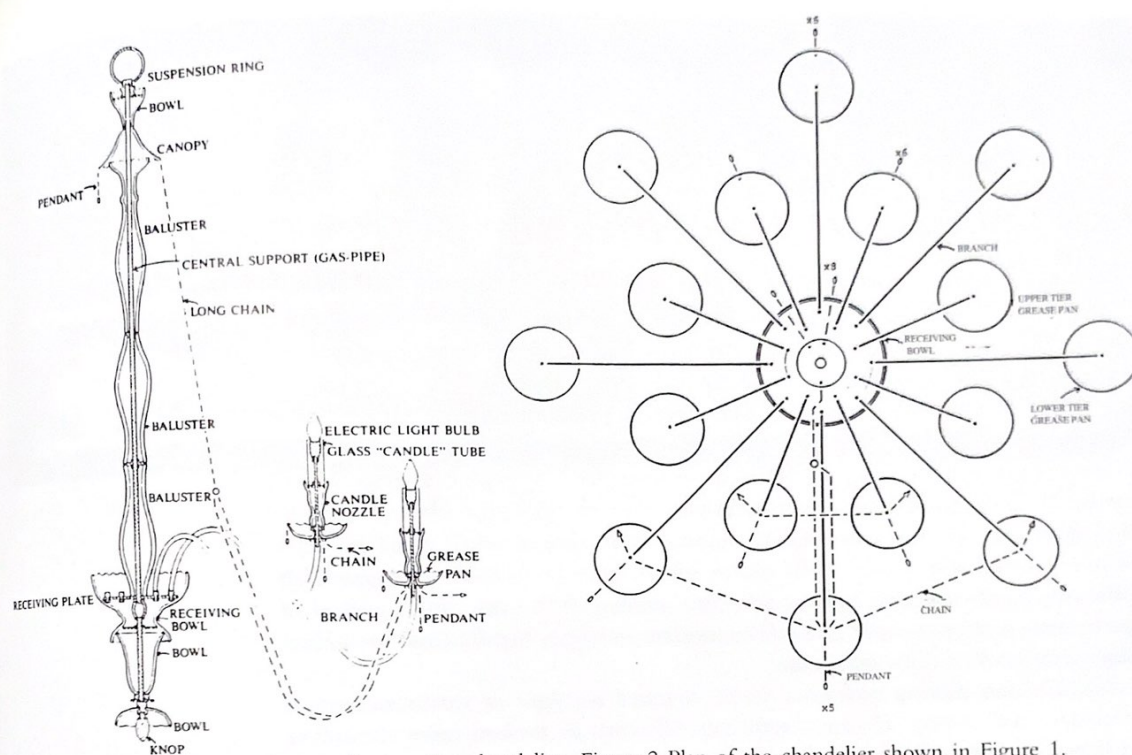


Figure 1 Diagram and nomenclature of a two-tier chandelier. Figure 2 Plan of the chandelier shown in Figure 1.

Early eighteenth-century advertisements note such things as lustres and branches which were employed as alternative names. They were also interchangeable with candelabrum, girandole and wall light, so the few literary references to any of the above may be ambiguous. Similarly, there appears to be no recognised terminology for describing the components of chandeliers. Thus a terminology had to be formulated in order to produce reports (see Appendix).

Planning

Since the majority of the work to be described is undertaken on site, considerable forward planning is required. Some of the points to be considered will be:

- a contract stating what the conservator is and is not responsible for
- public liability and employer's liability insurance
- the provision or hiring and erection of scaffolding
- sources of electricity, water and the means of refuse disposal
- materials, tools and equipment
- transport of equipment and personnel to and from the site
- delivery and/or parking facilities
- times of access (particularly any restrictions on working after 5.00pm or at weekends)
- facilities for tea-making, eating, use of toilet facilities
- accommodation (if the site is a considerable distance from base)
- packaging, transport and storage of chandeliers, if required
- cost of writing and producing a report, including photography.

Examination

During dismantling and cleaning, a photographic and written record is made of any damaged glass, of sections where glass is missing and any technological evidence. Where individual lustres, pendants and chains are found to have been misplaced, they can be rearranged where possible. However the reason for misplacement may be that a lustre has been broken so that there will be no hole through which to secure the linking pin. In order to correct this new lustres will have to be purchased.

Many chandeliers have chipped lustres, broken candle nozzles, greasepans, branches, balusters and bowls. Consideration must be given to the fact that large broken pieces of glass, such as bowls, if repaired and reused, must be inspected annually to check the strength of the repairs. In the case of modern chandeliers it is preferable to replace the broken glass, especially if heavy and/or load-bearing. Replacing glass sections either with contemporary pieces or with newly made sections can be expensive but is recommended for reasons of safety. Metal repairs in the form of silver sleeves over breaks on the glass branches strengthen the repair and are not immediately obvious from ground level. Smaller items such as faceted spires and small crowns which have been badly repaired with resin can be re-repaired. Lustres are easily damaged; the tiny holes drilled in them cause sections to split away if the pins are carelessly handled and once they have been broken they are useless.

All the brass linking pins need to be checked for signs of weakness and/or corrosion and, where necessary, replaced. All worn or broken wires should be replaced by using the soft brass pins manufactured for the purpose; they bend very easily while having sufficient strength to support the lustres and pendants.

The breakage of the 'candle' tubes occurs when they are compressed during the insertion of the electric light bulbs. The light fittings are not fixed in the cut-glass greasepans or candle nozzles, they therefore rotate while the bulbs are being inserted, requiring a certain amount of pressure to be exerted. It should be possible to design a device to prevent this from occurring in the future.

The central support stem of each chandelier is normally formed over a metal pipe or rod, threaded at both ends. The pipes may show evidence of rust, but this is not usually active. The metal suspension rings, receiving plates, tubes and washers are usually of silvered brass or Sheffield plate. Sheffield plate was a cheap substitute for solid silver and was used extensively from c 1760.

Glass chandeliers are most prone to damage from mishandling and from knocks by scaffolding or ladders used for cleaning or the changing of light bulbs. The risk of damage could be greatly reduced if each chandelier were to be fitted with a rise and fall mechanism, which could incorporate a limiting device restricting the drop of the chandelier. The replacement of light bulbs would be made safer, quicker and easier, thereby reducing maintenance costs after the initial cost of installation.

While the chandelier is in pieces it may be advisable to weigh it in order to check the weight against the ceiling loading, particularly if the provision of a rise and fall mechanism is a likelihood. With this in mind, the owner of the chandelier(s) may wish the ceiling fixings to be inspected by an architect and/or structural engineer. A record of the date when each chandelier was cleaned, dismantled, checked for the safety of the electrical wiring and ceiling connections should be kept by the conservator and by the owner.

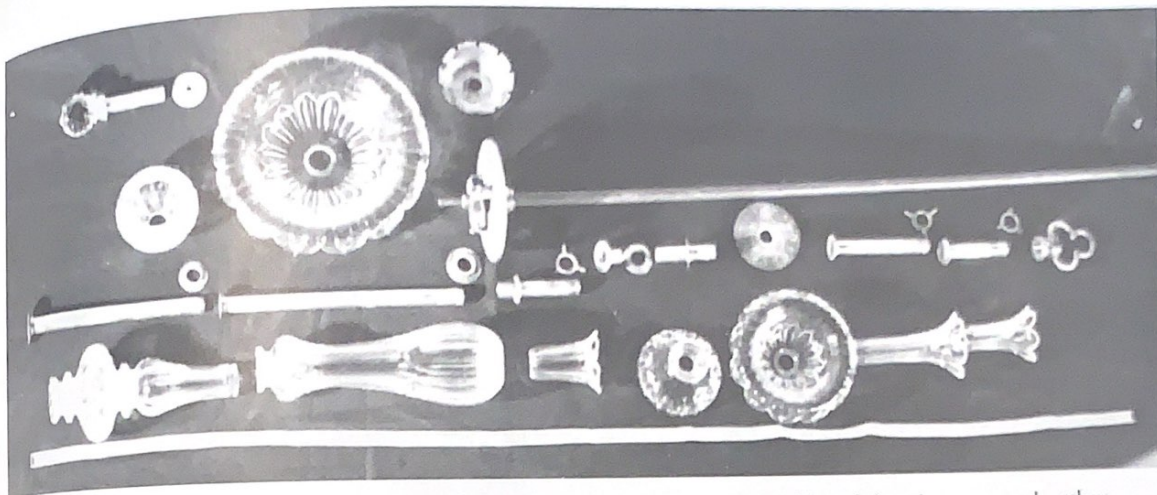


Figure 3 Dismantled chandelier (minus the branches) laid out to show the relationship of the pieces to each other.

Dismantling

Prior to and during the dismantling of the chandeliers, notes, sketches, black/white and colour photographs are taken so that there is a clear record of where each piece of a chandelier belongs in relation to the others (Fig 3). It is particularly important to note the way in which the branches join the metal receiving plate and the arrangement of electrical wiring (Figs 4 and 5).

Before commencing work it must be ensured that the electricity supply to each chandelier has been turned off. The conservator, accompanying the housekeeper or electrician assigned to do this, should ensure that there is no risk of the power being restored; it is advisable to attach a notice to the fuse board cupboard to the effect that the chandeliers are being worked on and must remain isolated until further notice. The isolation must be confirmed by an electrical test at each chandelier, i.e. the use of a voltmeter or other indicator to demonstrate the absence of the supply.

Each chandelier is dismantled in sequence, beginning with the pendants and chains, followed by the bottom section of the central support stem (Fig 6).

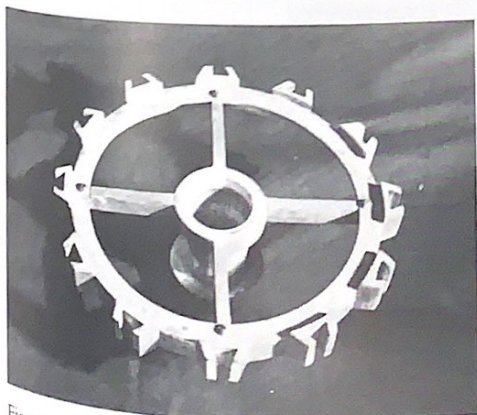


Figure 4 In this example, the branches slot into the dovetails of the metal receiving plate.

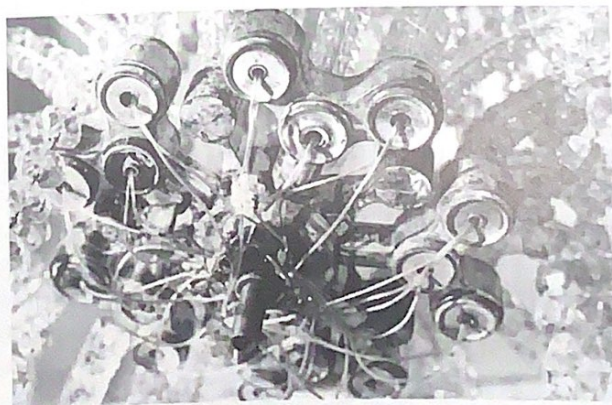


Figure 5 In this example, the branches slot through rings and are secured beneath the metal receiving plate by nuts.



Figure 6 Lower components. The glass bowl covers the electrical connections.



Figure 7 Supporting a glass branch while removing a light bulb.

Although the arrangement of the pendants and chains will need to be recorded, it is not necessary to note the exact position of every one since, firstly, their arrangement should be regular around the chandelier and, secondly, the chandelier will have been dismantled and cleaned many times since its installation so that the components are unlikely to be in their original positions. However, for safety and ease of identification, the pendants and chains should be removed in an orderly sequence, placed in labelled polythene bags and passed down from the working platform in plastic baskets or trays. The next stage involves the removal of the light bulbs and opal glass 'candle tubes' (if present). In order not to put undue strain on the glass branches during this operation they are supported by placing a hand beneath the greasepan to apply a slight upwards pressure to counteract the slight downward pressure required to release the light bulb (Fig 7). The glass branches are then removed along with their candle nozzles and greasepans. Firstly the glass and metal sections of the lower part of the central support stem are removed, thereby exposing the electrical wiring. The electrical supply already having been turned off, the wiring can be disconnected. If this involves cutting the wires, the branches or central stem may have to be rewired before the chandelier is reassembled. The glass branches are removed one at a time, if possible working from alternate sides so that the structure remains hanging evenly, and handed down from the working platform since there would be a danger of them tipping out of a tray. Once all the branches are removed, the metal safety hawser (if present) can be disconnected from below the receiving plate so that the receiving plate and glass and metal sections from the upper section of the central support stem can be removed individually. This operation

will require two pairs of hands, one to remove the glass one section at a time, and the other to hold the remaining unsecured glass in place. The glass sections are passed down from the working platform in plastic trays. Lastly, the central support is unhooked from the chain suspending the chandelier from the ceiling. If the chandelier is relatively small and not more than about ten feet high, it may be considered safer to pass the whole of the central support stem down to the floor in one piece by unhooking it from the suspension chain. Once down, the suspension ring and fittings and/or the circular metal receiving plate are removed, in order to release the glass balusters and bowls and attendant silver metal fittings (tubes, washers and nuts).

Cleaning

If the chandeliers decorate rooms which are in constant use, general cleaning may be necessary at yearly intervals and in-depth cleaning, involving dismantling, perhaps every ten years. The period of time between each cleaning will need to be determined by conservators and the owners. In deciding the frequency of cleaning, finance will have to be considered and the fact that there is a potential danger in handling and dismantling the chandeliers. If, on the other hand, the chandeliers are in rooms which are closed to the public for part of the year, the amount of dust and dirt that settles on them will be considerably reduced if they are protected by large muslin bags.

The glass is cleaned with a 50:50 solution of Industrial Methylated Spirit (IMS) and distilled or deionized water with the addition of a few drops of Synperonic N (non-ionic detergent), taking great care not to allow the cleaning solution to penetrate the hollow glass branches, or the metal light fittings. The glass is then rinsed with distilled water on a soft cloth and then polished with a dry cloth.

Cleaning using other chemicals, if absolutely necessary, should be restricted to the substantial metal parts, and then only to those from which the chemical residues can be safely and conveniently removed. If not removed thoroughly, chemical residues or byproducts will remain and eventually attack the glass, metal and metal link pins. The composition of materials used for cleaning should be known, plus the short- and long-term effects on the substrates (and upon the persons undertaking the work).

Light deposits of rust (ferric oxide Fe_2O_3) may be removed mechanically using a glassfibre bristle brush or, if necessary, chemically with a commercial rust remover such as Jenolite RRPJ (based on phosphoric acid). The action of the phosphoric acid on the ferric oxide converts it to form a protective coating of black iron phosphate, a positive corrosion inhibitor. The use of such a rust remover would also incur the removal of the original paint on the iron pipes. Thus it may be necessary to analyse a sample of the paint if any repainting is anticipated.

Light silver tarnish may be removed by immersing the silver in a solution of Goddard's Silver Dip (active ingredient thiourea). A soft bristle brush is used to clean the silver, alternatively the solution may be applied locally on cotton wool swabs. The bath of solution should be renewed frequently. After cleaning, the silver is rinsed in changes of distilled water. Severe tarnish may necessitate the use of a mild abrasive such as Goddard's Silver Foam, gamma aluminium in alcohol, or precipitated chalk in a distilled water/alcohol mixture. Coarser abrasives would damage the metal surface.

Traces of the cleaning agent are removed with copious amounts of warm distilled water and the silver left to air-dry before being polished with a soft cloth impregnated with an anti-tarnishing agent. Lacquering the silver is not recommended since it will easily be scratched off moving parts and thus the silver will tarnish in streaks; often much of the metal is covered by glass and therefore tarnishes very slowly. Lacquer would be time-consuming to remove and renew.

There is a growing awareness that chandeliers, along with other fixtures and fittings in historic houses, should be recorded in an appropriate manner and it is important that conservators should be involved in the work. Indeed, after this chapter had been prepared, a complementary article (Reilly & Mortimer 1998) has also addressed the need for relevant information to encourage the proper care and conservation of glass chandeliers. Since the initial recording of the chandeliers for the Mansion House, The Conservation Studio has worked on other similar projects, most notably a suite of seven chandeliers at the Atheneum in Bury St Edmunds, Suffolk; and the piecing together of fragments of two chandeliers damaged in the fire at Uppark House, Sussex.

In cases where chandeliers require rebuilding, especially of the metalwork, or repinning or the manufacture of new glass components, the advice of specialist firms must be sought.

Appendix: Glossary of terms used when recording chandeliers

- Baluster: a short post or pillar, usually circular in section with an undulating profile; thus the name is applied not only to furniture or rails but to similarly shaped vases, glasses etc. In reports, baluster is used to describe the tall hollow glass sections which, along with glass bowls, cover and decorate the central metal support shafts.
- Bowl: a basin. In reports, bowl is used to describe the globular glass sections which, along with glass balusters, cover and decorate the central metal support shafts.
- Branch: a limb springing from a tree. In reports branch is used to describe the arms of a chandelier.
- Canopy: a suspended canopy. In reports a canopy is used to describe the inverted glass bowl at the top of some chandeliers.
- Chain: a connected series of metal or other links. In reports a chain is used to describe the glass lustres linked by brass pins and which are suspended between and from the glass branches.
- Electrolier: a cluster of electric lamps (from electro on chandelier) i.e. a chandelier wired for electric lighting.
- Gasolier: a gas lamp, usually suspended from a ceiling, with several burners often on branches (from gas on chandelier) i.e. a chandelier fitted for gas lighting. These have sometimes been converted for electric lighting.
- Gesso: derives from the Italian for gypsum (calcium sulphate). In its broadest sense gesso is any aqueous, white priming or ground material used to prepare wooden panels or other supports for painting or gilding. In modern usage gesso is often used erroneously to mean plaster of Paris.
- Girandole: a candelabrum. The name derives from the Italian girandola, a type of firework. In the late seventeenth century the name was applied to an elaborate type of candelabrum with pendants of cut crystal or glass, forming a pyramid of light. In the eighteenth century the name was applied to all candelabra as well as chandeliers or lustres, with or without crystal pendants. In England in the eighteenth century the word was used especially for large carved and gilt wood sconces in the Rococo style. The term is also used for a wall bracket, often with a mirror back. In the late eighteenth century the mirror was often made circular and convex, and was sometimes used alone.
- Greasepan: the small dish beneath the nozzle of a candlestick.
- Lustre [1]: the French name for a chandelier. In the sixteenth century the more elaborate types of French chandelier were decorated with rock-crystal drops; in the seventeenth, with many-faceted pieces of crystal which reflected the light of the candles: they were called

- chandeliers de crystal. Expensive crystal was often replaced by cut glass from the late seventeenth century, when the term lustre began to be applied (as it still is) to all chandeliers whether or not they incorporated pieces of crystal or glass.
- Lustre [2]: gloss, brilliance or bright light. In reports lustre is used to describe the faceted round, octagonal flat back (o.f.b.), oval and pear-shaped (p.s.) glass drops used to decorate the glass chandeliers.
- Nozzle: spout or mouthpiece. In reports nozzle is used to describe the glass or wood holder into which the electric light fitting is set (originally these would have been candle nozzles).
- Receiving plate: the metal plate which screws onto the main pipe around which a chandelier is formed and into which the glass branches are secured.
- Sconce: a wall light consisting of a bracket candlestick with a polished back-plate to reflect the light. From the late seventeenth century onwards the back-plate is often a mirror. Elaborate, and especially rococo, sconces are sometimes called girandoles. The term has been used erroneously to describe greasepans.
- Shaft: a stem, stalk, column between base and capital, part more or less long, straight and narrow, supporting or connecting parts of greater thickness. In reports central support shaft is used to describe the pipe or rod inside the baluster(s) and bowl(s) to support them and which hooks on to the metal suspension chain to the ceiling.
- Slip: a kind of loose covering or garment. In reports candle slip is used to describe the tubular glass or cardboard sleeve which covers the electric light fitting and which simulates a candle.
- Spire: a tapering structure in the form of a tall cone or pyramid. In reports a spire is used to describe a tapering glass decoration.

Materials and suppliers

- Synperonic N: an aqueous solution of a condensate of nonylphenol with ethylene oxide. Used as a non-ionic detergent, a wetting agent, an emulsifying agent or a dispersing agent. Available from: Conservation Resources (UK) Ltd, Units 1-2, 4 Pony Road, Horsepath Industrial Estate, Oxford OX4 2RD, UK.
- IMS: 99% Industrial Methylated Spirit. Ethyl alcohol denatured by the addition of 5% wood naphtha. It can only be supplied, in the UK, on receipt of an official requisition obtainable from the local office of HM Customs and Excise. Available from chemical suppliers.
- *Jenolite RRPJ: a phosphoric acid type rust remover in the form of a jelly.
- *Goddard's Silver Dip: active ingredients thiourea and mineral acids.
- *Goddard's Long Term Silver: cloth impregnated with fine abrasive (diatomaceous earth and jewellers' rouge).
- *Goddard's Silver Foam: fine abrasive, as above, in suspension.
- Fine abrasive: available from jewellers' suppliers.
- Brass pins: available from R. Wilkinson & Son, 5 Catford Hill, London SE6 4NU, UK.
- *Available from hardware stores.

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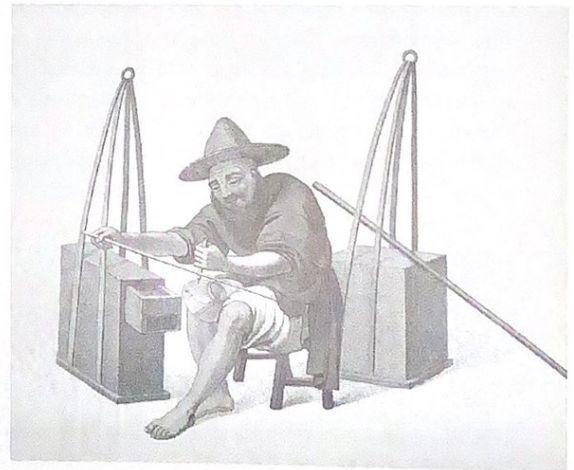
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