

From Vulgarly to the Current of Fashion

The Impact of Electroplating on Victorian Industry, Marketing, and Design

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From the moment that electroplating became an industry in Victorian Britain it was received with mixed responses. The focus of this exhibition is to illustrate the arguments between the Victorians who believed that electroplating was a vulgar commodity and those who supported it as a major current of fashion. In so doing, the Victorian views concerning industry, marketing, and design will be revealed, showing the interactions between them. An emphasis will be placed on design reform and how industry and marketing affected ideas of good design. Also explored in the exhibition are the influences on electroplating that reflect the broader scope of Victorian society. These include Victorian views towards work, education, the home and Britain's empire. This exhibition sets out to illustrate why the arguments surrounding electroplating reflected the concerns of Victorian society.

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Introduction

□ *Structure of the Exhibition*

Though electroplating, an electrical process of plating metal, is still an important method that is used today, this exhibition covers its emergence as a great industry in 1840 to its decline in the early twentieth century. This time period covers the epoch of Queen Victoria's reign (1837-1901) and the examination of electroplating, therefore, sheds light on Victorian society and values. Because electroplating has a strong historical connection to the Victoria and Albert Museum, London (V&A), all of the objects in the exhibition are chosen from the museum's collection. In 1857 Henry Cole founded the V&A (called the South Kensington Museum until 1909) to hold contemporary and historical objects that exemplified good design for art students and industries to uphold.¹ For this reason, the objects in the exhibition that were bought by the museum from important nineteenth-century exhibitions give insights on Victorian taste.

The V&A strengthened its promise to promote art education by becoming one of the pioneering museums to sponsor electrotyping, a process that uses electroplating techniques to copy existing metalwork. *The Example of Electrotypes* focuses on the importance of electrotypes in design education at the V & A. Because of the small scale of the exhibition and its link to the V & A, it would ideally suit a study area in the metalwork gallery as a temporary or permanent exhibition. The majority of the comparative objects in the exhibition are also taken from the V&A's collection and visitors could easily refer to these examples in the museum.

The exhibition draws upon three major themes in the arguments that supported and opposed electroplating: industry, marketing, and design. Although each subject is explored individually, the exhibition shows how each theme is related.

The Shock of New Technology explores how electroplating business, technology, and working conditions affected those within the metalwork industry. It examines how the Elkington cousins maintained a stronghold on the electroplating business and why their methods incited discontent within the industry. *Replacing Sheffield Plate* compares electroplating to Sheffield Plate and explains why electroplating superseded earlier methods of plating metal. *Factory Conditions* places the concerns faced by the men and women who worked in electroplating factories within the Victorian views of work and social change.

Electroplating was one of many Victorian innovations and *The Art of Advertising and Buying Electroplate* shows how new forms of communication and industry spread electroplate to a wide range of consumers. *Symbols of a New Class* explains why the rising middle class responded to electroplate with traditional designs and how this section of society used it in public and private settings. Because electroplate has the appearance of precious metal, its markings were carefully watched by silver and goldsmiths and *New Markings* shows how electroplate was identified.

The final section of the exhibition focuses on design whilst showing how Victorian design reformers considered the technology and marketing of electroplate in their ideologies. *From Challenging to Embracing Electroplate* is divided into two sections. *The Great Exhibitions and the Dilemmas of Design* focuses on the arguments inspired by electroplating, electrotyping, and electroforming in the International Exhibitions of the nineteenth-century. The section compares reformers like Henry Cole who wished to merge art and industry with revivalists like A.W.N Pugin and John Ruskin who believed that the two spheres should remain separate. It will also examine the importance of electrotypes to art education at the South Kensington Museum, a product of the Great Exhibition. While the reformers in the first section praised historicist styles, the designers Christopher Dresser and C.R. Ashbee desired new aesthetics inspired by established styles. *Innovative Aesthetics* shows how the design ideals of

Dresser and Ashbee were linked and how their thoughts concerning the electroplating industry and marketing differed.

□ *Understanding Electroplating*

In order to relate electroplating to its social context, it is important to understand the electroplating process and to place it within the scientific environment in which it was invented. Successfully developed in the 1830s, electroplating is an electrical process that was usually used to plate a less valuable metal with a precious one like silver or gold. The first stage of the process involved forming the object to be plated, usually in copper or nickel silver. The object would then be plunged into a liquid bath of the metal salts of the precious metal and attached to a negative electrode. Opposite the negative electrode was a positive electrode that replenished the metal ions in the solution when an electrical current was introduced. The electrical current reduced the solution and allowed a sheet of metal to be plated onto the object (see diagram of an electroplating shop, comparative plate 1).² The process became important because of its ability to produce a large output of objects more quickly and inexpensively than traditional methods.³

Though the fascination in plating metal reaches back to antiquity, electroplating was discovered because of the increased interests in science and the desire for monetary gain during the Industrial Revolution.⁴ Like the textile, coal, and metalwork manufactures that began to prosper during the second half of the eighteenth century in Britain, the electroplating industry strove to use its technology to mass produce its product and reach a wide range of consumers.⁵ Luigi Galvani, and Alessandro Volta each made individual discoveries in electricity around 1800 which provided the basis for the steady, direct current needed to create even layers of plate.⁶

Early attempts at electrogilding show the concern for overriding the need for mercury gilding, a practise used since the Middle Ages. Although mercury gilding created a lasting

finish, the process produced dangerous fumes that caused the premature deaths of many workers.⁷ In 1805, Luigi Vincenzo made the first successful gilding of two silver medals by using Volta's invention of an electric pile.⁸ Rundell, Bridge and Rundell, the Royal Goldsmiths during the first half of the nineteenth century, also experimented with electrogilding. 'The Galvanic Goblet,' made by the firm's major artist Paul Storr, is an example of electrogilding, though the firm did not produce electroplate on a large scale.⁹ The technology was not yet capable of supporting an industry until experiments perfected the technique in 1840.¹⁰

Though electroplating was developed during the 1830s by individual scientists all over the world like the French chemist Henri de Ruolz, it was the Birmingham entrepreneurs Elkington & Co. who first made electroplating an industry.¹¹ The obituary of Charles Christofle, the head of the major French electroplating firm, claimed that electroplating was as revolutionary to the nineteenth century as the scientific discoveries of the electric telegraph, photography, and the railway.¹² These links between technology, art and industry had profound effects on how electroplating was received in the Victorian Age.

Chapter 1 – Industry: The Shock of New Technology

□ *The Forming of an Industry*

When the Birmingham manufactures George Richards Elkington (comparative plate 2) and his cousin Henry patented a successful formula for electroplating on 25th March 1840, their business savvy was greeted with both admiration and dismay within the metalwork industry.¹³ During the 1830s, the cousins ran a business with a branch in London that made gilt toys (novelty items such as spectacle cases).¹⁴ Elkington's main concern was to find a cheaper, faster and safer way to make the items reach a wider market.¹⁵ To meet their goal, they aggressively sought out the leading scientists and businessmen of their day to insure that they would become the leading electroplating manufactures.¹⁶

The Elkington patent, however, enraged those within the industry who felt that the rights should belong to the original creators of the process.¹⁷ Although the cousins made experiments of their own in the 1830s, they guaranteed their success by employing scientists in the electroplating field.¹⁸ Not all collaborators, however, responded whole-heartedly. The Elkingtons ensured their process would produce the finest plate by purchasing the idea for the key electrolyte from John Wright. Wright, a surgeon working in Birmingham, discovered that potassium cyanide mixed into the electroplating solution produced firmer plating.¹⁹ Although the Elkingtons had taken out a patent for electroplating in March 1840, they had a six-month grace period in which to specify the ingredients of their process. In a confidential statement made by G.R. Elkington to his legal advisors, he claimed that he became aware of Wright's idea a few weeks before the specification was due.²⁰ Though the Elkingtons stated that they had discovered a similar process that used ammonia, they purchased the idea of potassium cyanide from Wright after an agreement was made between them.²¹

Wright made Elkington's conscience of their rivals and this seems to have inspired them to buy up other patents that improved their process. The Elkington's also maintained a

stronghold on their business by setting up strict conditions for other businesses to obtain a license to use their product. Licenses were sold widely to firms in England and abroad including Christofle & Co., Paris.²² Although many silversmiths expressed interest in buying the rights to use Elkington's patents, they were discouraged by Elkington's demands. G.R. Elkington required that firms desiring the patent rights make a down payment of £1000, pay a royalty on the ounces of silver deposited, and stamp their wares with Elkington's mark alongside their own.²³ Finding that these terms discouraged buyers, G.R. Elkington alleviated these demands, including the request that their mark be stamped on other companies' products.²⁴

Further collaborations perfected the electroplating process and expanded Elkington's business. Anticipating that electroplating would bring them success, the company began to build a factory and showrooms in Newhall Street, Birmingham in 1838.²⁵ To help finance their growing business, G.R. Elkington invited Josiah Mason, a wealthy pen manufacturer, to become a partner in 1842, forming Elkington, Mason & Company.²⁶ Under this partnership, the firm obtained patent rights for a plating dynamo that improved the electric current introduced into the solution. Although J.S. Woolrich, one of the original patentees of the dynamo, had issued licenses to other firms in 1842, he did not grant permission to Elkington, Mason & Company because he wished to give smaller companies a chance to compete in the metalwork business. The Elkingtons, however, bought the patent rights from a third party in 1846 and created a magneto machine that incorporated improvements made by scientists within their company.²⁷ An illustration from Cassell's Illustrated Exhibitor, 1852, shows the dynamo serving the vats into which objects for plating were suspended (see comparative plate 13). The machine enabled their electroplating process to deposit fifty ounces of silver an hour.²⁸

Alexander Parkes, who had worked as Elkington's chief metallurgist since the late 1830s, helped to improve the electroplating process in order to make Elkington's product unique and of better quality than competing manufacturers.²⁹ An electroformed vase designed

by Parkes around 1845 represents Elkington's ingenuity (catalogue plate 1). The vase is an early example of electroforming and electrogilding from the Elkington factory. Parkes was aware of electrotyping experiments made by Professor H.H. von Jacobi of St. Petersburg, and the English craftsmen Thomas Spencer and C.J. Jordan and altered their discoveries to improve the process of casting into a mould.³⁰ Although electrotyping, which created a replica of an original metalwork by plating onto a mould of the object, was not covered in the Elkington's 1840 patent, these alterations allowed the Elkingtons to claim it as their own.³¹ By using the electroforming process, a similar process to electrotyping, an original design could be created and easily multiplied to reach the mass market.³² Parkes's vase represents Elkington's concern to appeal to all levels of society by making original designs at a reasonable price.

The electrogilded vase also shows how much the process patented by Elkington's had improved upon the early nineteenth century examples by Vincenzo and Storr. The thick, even gold coating was produced by a constant battery and was more durable than the gilding created earlier in the nineteenth century. Though the process was safer than mercury gilding, it was not able to replicate the smooth, matte finish of mercury gilding as shown on the medieval example of the Mérode Cup (comparative plate 3). Because the gold was deposited onto the copper base particle by particle electrogilding produced a grainy texture of gold onto the surface of the vase.³³ Although the vase represents Elkington's improvements to the electroplating process, it also serves as an example of Elkington's stronghold on the technology of the electroplating business and the complaints that scientists and factories that believed Elkington's had wrongly taken advantage of earlier experiments.

□ *Replacing Sheffield Plate*

After the Elkington patent was taken out, electroplating business devastated the Sheffield plate manufacturers more than any other part of the metalwork industry. Elkington's stronghold on the electroplating industry struck the core of the metalwork businesses located in Birmingham and Sheffield. The electroplating industry took over the Sheffield plate establishment in two ways. Firstly, electroplating was capable of mass-producing plate with a more even, firmer outer plate than Sheffield plate. Factories therefore preferred the new technique because it required less labour and produced a better finish than Sheffield plate. Secondly, Sheffield plate factories began to produce electroplate and replaced the old techniques with the new methods in order to reach a wider audience.

In order to examine why electroplate superseded Sheffield plate, it is necessary to understand the processes involved in its manufacture. Unlike electroplate, which was coated with silver after it was formed, Sheffield plate required that a sheet of silver be infused onto a sheet of copper before it was worked. The layer of copper was 'sandwiched' by a top and bottom layer of silver or coated on one side by soldering silver onto the copper sheet. The ingot was then thinned into a sheet through a rolling machine and was then worked on as if it were a sheet of solid silver.³⁴ Sheffield plate workers were limited to working on a small number of objects at one time and one of the foremost reasons that electroplating overtook the Sheffield plate industry was its ability to mass-produce its product. As shown in a drawing of the Christofle factory, many objects were placed in the vats to be coated in one process (comparative plate 4).³⁵

Although electroplate manufactures used similar techniques as the Sheffield plate industry, electroplate was more ideally suited for industrial methods. The popularity of naturalistic ornament aided in the prominence of electroplating over Sheffield plate. Revival

styles were a major part of Victorian design and rococo ornament, based on eighteenth century French style, was usually combined with designs inspired by nature.³⁶ Like naturalism, the Rococo was based on the organic and both styles were expressed by curves.³⁷ A Sheffield plate candelabrum made by the firm T.J. & N. Creswick in 1840 demonstrates the problems that organic, curvilinear ornament posed to workers in Sheffield plate (catalogue plate 2). Sheffield plate craftsmen had to be skilled in shaping and putting together objects in order to hide the copper edges of the plate.³⁸ Although Sheffield plate was discovered by Thomas Boulsover in the 1840s, it emerged as a popular commodity in the 1770s.³⁹ Sheffield plate was suited to the sparse, geometrical Neoclassical decoration of the latter eighteenth century because craftsmen could easily cover the exposed copper with coats of silver.⁴⁰

The curvilinear decoration associated with the Louis XV styles was better expressed by electroplating. As the T.J. & Creswick candelabrum shows, the die-stamped C and S scrolls on the arms exposed copper in many places and required much labour to cover the intricate details with silver. Because an object was stamped before plated in the electroplating vat, the curves of the neo-Rococo style could be evenly covered with layers of silver in one step, cutting the cost and time of the labour involved in Sheffield plate.⁴¹ As a result, the candelabrum was electroplated later on in the nineteenth century to hide the copper exposed by the Sheffield plate.⁴²

The process of coating the copper plate after it was formed allowed electroplating to surpass the Sheffield plate methods of engraving and pierced work. Engraving, a process that removes metal to create a design, revealed the copper underlayer on Sheffield plate. Because engraving was usually used for small sections of an item to display designs like a coat of arms, the decoration would be engraved on a separate piece of sterling silver. A round or oval section of metal from the Sheffield Plate was cut out and the silver, cut to the same shape as the hole, was soldered into the opening. This process, known as 'letting in', can be seen in a Sheffield plate teapot stand made around 1790 (comparative plate 5).⁴³ Electroplating decreased the

labour involved in 'letting in' because a worker could engrave the copper layer and then coat it with silver, creating an even surface of metal as shown by an entrée dish cover made by Elkington's for the Midland Hotel (catalogue plate 4).⁴⁴

The Sheffield plate industry also developed a way to overcome the limitations of the material in order to create pierced work. The traditional silversmith method for achieving pierced work involved using a fretsaw that ripped the surface of the silver. This proved unsuitable for Sheffield plate because it separated the silver coating from the copper and exposed the core. Sheffield plate factories instead used a fly-punch, a machine that worked like a printing press to pierce the plate when a crossbar was turned to put force onto a cutting tool with the desired design. As a Sheffield plate cake basket made around 1780-1790 shows, the fly-punch covered the exposed copper by dragging the silver over the copper core and concealing it (comparative plate 6).⁴⁵ An electroplated cake dish made by William Gough & Company in 1850 (catalogue plate 8) shows that the Electroplated silver and gold coatings covered the formed copper more evenly and with less labour than Sheffield plate.

Another advantage of electroplate was that it could be cast.⁴⁶ This is most evident in the comparison of two candlesticks. A Sheffield plate candlestick made by the Matthew Boulton's firm in Sheffield is comprised of three sides of die-stamped plate soldered together and pitch was placed in the candlestick to give it weight (comparative plate 7).⁴⁷ The two sides of an Elkington candlestick, however, were first cast in copper and then soldered together (catalogue plate 8). The Elkington candlestick shows another advantage of electroplating over Sheffield plate in the multiple metals that coat the layer of silver. To customize their product for different consumer tastes, Elkingtons allowed the customer to choose from a variety of finishes. This candlestick displays two of these choices in the electroplated sections of gold and oxidized silver.⁴⁸ Because the copper was coated after it was shaped, the precious metals cover the seams and the altering sections of colour draw the viewer's attention away from the soldered lines. This improved upon the Sheffield plate method of disguising the seams, in which the

maker had to create ornament around the soldering lines to incorporate them into the design. Leaves adorn the borders of the soldering lines on the Boulton candlesticks to make them less noticeable.

Ironically, the electroplating business also took advantage of and improved plating methods used by the Sheffield Plate industry. One of the techniques used by both industries was spinning, a process founded in the 1820s which shaped hollow wares like the entrée dish cover by turning them on a lathe.⁴⁹ Another Sheffield Plate invention that was used by the electroplating industry was the plating of nickel silver between the copper and silver layers. Because nickel silver, or German silver, has a colour similar to silver, the wearing away of the top coat of silver was less noticeable than the exposure of a copper core.⁵⁰

One of the main causes of discontent within the Sheffield plate industry was Elkington's monopoly on the electroplating business. The initial licensing terms set by the company enraged Sheffield platers who disagreed with the strict terms of paying a royalty to Elkington's and stamping another company's name on their own product.⁵¹ Although Elkington's reduced these terms, some Sheffield plate companies still found that the cost of reinventing their established businesses was too high. In order to produce electroplate, Sheffield plate factories had to buy new equipment, including new dies, to keep up with the changing technology and styles.⁵² Sheffield platers like T.J. & N. Creswick and Roberts, Smith & Company were wary of the new technique and decided to turn down the Elkington license proposals in 1841.⁵³ Samuel Roberts, who had recently retired as head of Roberts, Smith & Company, advised the company to decline the chance to produce electroplate because, 'I am persuaded that their mode of plating will inevitably be much less used, than you are anticipating'.⁵⁴ By 1843, the company decided to produce electroplate, finding that Sheffield plate looked old-fashioned in comparison.⁵⁵

Sheffield plate, nevertheless, was produced until the end of the century. James Dixon & Co. continued to make Sheffield plate alongside electroplate. As a sign of respect for the

fading Sheffield plate business, James Dixon & Co. was awarded for both Sheffield plate and electroplate in the 1862 International Exhibition.⁵⁶ Although Sheffield plate was a rarity at the end of the century, it was used in carriage lamp parts and buttons because of its durability.⁵⁷

□ *Factory Conditions*

Electroplating had a direct effect on increasing the number of factories and workers in the industrial cities of Britain, especially Birmingham and Sheffield. Even before electroplating was invented, these cities were the core of the metalwork industry and attracted workers wanting to make a living from the metalwork business. Matthew Boulton's factory at Soho, Birmingham was one of the largest Sheffield plate and silver factories in the country and employed 800 workers in 1770.⁵⁸ In the 1860s, Elkington's was the largest firm in Britain and their Birmingham factory had 1000 workers.⁵⁹ As more Sheffield plate companies adapted their factories to the production of electroplate, Sheffield and Birmingham grew in size. The population of Sheffield increased from 31,000 in 1800 to 380,000 by the end of the century and the effect can be seen in the smoke-filled air in a print of Sheffield from The Graphic, 1874 (comparative plate 9).⁶⁰ Working and living in industrial cities concerned many Victorians who felt the effects of poor factory conditions. The rising cities, nevertheless, were also symbols of the importance of work and the aspirations of creating a better society.

With the emergence of Britain as the leader of the Industrial Revolution, workers became concerned about their rights and electroplating factories were at the centre of the fights for better working conditions. Electroplating proved to be dangerous for workers who had immediate contact with the potassium cyanide in the vats. The Application of Art to Manufactures, 1858, cites that 'ulcers formed on the skin' of workers who touched the silver solution.⁶¹ Explosions of the cyanide vats were also a dangerous phenomenon and one report records the burning of the face of a worker.⁶² Large factories like Elkingtons avoided these problems by constructing well designed buildings.⁶³ However, smaller companies, especially those that formally made Sheffield plate, could not afford such luxuries because of the cost of buying new materials.⁶⁴ For example, polishers were exiled to the worst part of the factory

because their job was considered less important. The poor ventilation risked their health because fine dust from polishing got into the workers eyes, nose and lungs.⁶⁵

These conditions enticed government and unions to regulate electroplating factories. The increasing number of industry workers included women and children and the Parliamentary Children's Employment Commission, 1862, showed concern for these workers in its evaluation of the factories. Although older workers were desired because skill was required to operate the vats, apprentices as young as fourteen years old were taken on to learn the trade. The Children's Employment Commission criticized smaller shops of Birmingham and Sheffield for being 'overcrowded, dark and untidy'.⁶⁶ Likewise, the spaces of women in factories were also seen as poorly ventilated and 'gloomy'.⁶⁷ Women as young as 13 were usually given the job of buffing electroplate and their confined quarters are shown in an engraving of Martin, Hall, and Co. from 1874 (comparative plate 10). Factories like James Dixon and Co., therefore, had to allow women to take a one-hour meal break in order to keep them from fainting.⁶⁸

Despite their appalling working conditions, electroplating factories provoked arguments that claimed industry was the key to supporting the middle class. George Cruikshank's The British Bee Hive shows the Victorian belief that industry supported the structure of society (comparative plate 11). Victorians saw their society structure as a pyramid, with royalty, aristocracy and the arts at the top of the 'beehive' supported by industry. Although the professions were classified into a structure, industrial workers believed that hard work and morality would enable them to climb the ranks of society.⁶⁹ Ford Madox Brown's 1852-65 painting Work emphasized the idea that work served a moral purpose that upheld society's larger structure (comparative plate 12). The painting depicts navy labourers digging drains in the centre of the picture. Madox Brown added every part of Victorian society in his study of daily workers, including a street vender selling flowers, the well-dressed merchants and industrialists of the middle class that overlook the labourers, and the intellectual thinkers, one of whom is Thomas Carlyle on the right, who work to improve society.⁷⁰ The composition of

people creates a circle and stresses the interdependency between each section of society to create a harmonious, strong whole. These arguments, too, called for better working conditions and by the end of the century most factories were regulated to reduce the harm to workers.⁷¹

Many artists and designers, nevertheless, felt that the division of labour drained the creativity and essence of art in industrial products. The division of labour was especially effective in mass-producing electroplate. For example, many men would have been responsible for working with the plating vats everyday for twenty years.⁷² Similarly, a wood engraving from the newspaper The Graphic examines the assembly-line manufacture by hand and machine of workers in the Elkington's workshop (catalogue plate 3). In The Condition of the Working Class in England, 1846, Friedrich Engels, who shared similar ideas with Thomas Carlyle, wrote that he was enraged at the repetition that each worker faced in a mass-production line. Engels argued that 'much human feeling' was lost in the workers who were forced to repeat the same job throughout their lives.⁷³ Engels and designers like A.W.N. Pugin, John Ruskin, William Morris, and C.R. Ashbee felt that the lack of creativity allowed to industrial workers led to the downfall of good design. These arguments concerning industry and design will be explored in the *Design* section of the exhibition.

Chapter 2 – Marketing: The Art of Advertising and Buying Electroplate

□ *Reaching a Wide Audience*

The ability to mass-produce electroplate allowed the industry to reach a wide range of consumers. Although electroplate was used by both wealthy clients and poor consumers, the industry wished to appeal to the largest class, the rising middle class. As mentioned in *Factory Conditions*, the Industrial Revolution opened up many jobs for the middle class. With the spread of wealth, especially in cities, came the interest in buying material goods.⁷⁴ The electroplating industry took advantage of the new opportunities in advertising that became available as a result of innovative technology. This section will explore three major ways that the electroplating industry attracted a wide audience to buy their product: published advertisements, public transportation, and new methods of shopping.

By mid-century, newspapers were widely accessible and articles on electroplating factories and advertisements for electroplated products incited much interest within the public. Illustrated journals obtained a wide circulation amongst the middle class who were excited by the engravings depicting contemporary political and social events.⁷⁵ These journals became a large-scale commodity in the 1840s because of technological advances in printing that allowed inexpensive, high-speed mass reproduction of engraved imagery. One of these inventions included the use of electrotyping to make durable type metal replica blocks that enabled greater print-runs.⁷⁶

Articles in The Graphic and Cassell's Illustrated Exhibitor featured detailed illustrations of electroplating factories that fascinated readers in the new technology and electroplating products. A November 1874 issue of The Graphic featured wood engravings of a visit made by H.R.H. The Prince of Wales to Elkington and Co., Birmingham (catalogue plate 3).⁷⁷ In 1852, Cassell's Illustrated Exhibitor presented wood-engravings of the workers within the Elkington's factory (comparative plate 13).⁷⁸ These detailed accounts of soldering, burnishing, and steam

stamping created an awareness of the human involvement within the craft. The engravings also made readers capable of understanding the science of electroplating.⁷⁹ As an editor of The Penny Magazine enthused, the electroplated products came to symbolize the magic of Victorian technology: 'There are from time to time novelties introduced into manufactures so startling that it is difficult at first to regard them in the sober light of industrial processes; since they seem to belong rather to the marvellous than to the real'.⁸⁰

New businesses and modes of transportation, including the railway, also spread the desire for electroplate. By 1850, the railway had successfully developed across Britain, allowing easy transport for workers and vacationers who were largely from the middle-class.⁸¹ As an Illustrated London News engraving of the first dining-car service on the Prince of Wales Pullman shows, the interior of the cars provided passengers with luxury that mirrored the comfort of the Victorian home (comparative plate 14). The high-backed, padded chairs and complete dining sets on the tables show that the railways aspired to replicate the elegance of the middle-class home.⁸² A well-set table was an important way for Victorians to display their wealth and it provided the means for eating elaborate dinners.⁸³ The railways took advantage of mass-produced electroplate to cater to the large numbers of passengers at a reasonable price.⁸⁴

The expansion of the railway also increased the need for electroplate in hotels for passengers to enjoy a luxurious dinner. An entrée dish cover made by Elkington and Company in 1865 is engraved with the crest of the Midland Hotel, which served passengers travelling through King's Cross Station, London (catalogue plate 4).⁸⁵ Though the Elkington dish cover is a stock design advertised in their catalogues, the company could cater to their individual business by paying extra for the addition of an engraving bearing the mark of the business.⁸⁶ To Victorians, electroplating reflected their changing world and the process of making silver by electricity seemed as 'magical' as travelling by railway.⁸⁷

New industries also allowed individuals to buy electroplate. The nineteenth-century was the age of the catalogue and customer choice.⁸⁸ Although the catalogue was used before

the Victorian Age by businesses like Matthew Boulton's Sheffield plate factory, electroplaters exploited the use of catalogues.⁸⁹ Elkington's was one of the first businesses to publish illustrated price lists.⁹⁰ A catalogue featuring the oxidised and gilt candlestick in comparative illustration in this exhibition shows that electroplating catalogues offered choices of finishes and, for an additional price, a personal engraving (comparative plate 15). The catalogues were sent to homes and were placed in Elkington show rooms to encourage customers to buy their products.⁹¹

Electroplating was also distributed through the popular Victorian pastime of shopping. An advertisement in The Queen shows that the showrooms of The Goldsmiths and Silversmiths Company allowed customers to examine silver and electroplate and also let them exercise their freedom of choice by comparing different designs (comparative plate 16).⁹² In the nineteenth-century, the shop had become the key form of retailing and businesses built large multi-storied stores like the Mappin Brothers' shop in Regent Street, London to entice passers-by to window shop or to come in and buy their merchandise (comparative plate 17).⁹³ All of these methods of dispersing electroplate contributed to the fact that more silver and plate was produced in the Victorian Age than in any other century.⁹⁴

□ *Symbols of a New Class*

The increasing amount of plate produced in the nineteenth century was also a result of the importance of silver to the rising middle class. Electroplate not only signified Britain's prestige as the leader of the Industrial Revolution, it also represented the new found wealth of the middle class. Gold and silver had always been important expressions of wealth and power for the aristocracy and from the eighteenth century the middle class, too, could afford to buy silver and its imitations.⁹⁵ As the middle-class became wealthier in the nineteenth century, they desired to own the luxury items that had been symbols of status to the aristocracy.⁹⁶ Because silver had been one of the greatest objects of wealth, the new middle class embraced electroplate as a mark of their social status. The rising class aspired to the luxury of previous generations by preferring styles that had been patroned by wealthy consumers. In their use of electroplate at home and in dining, the middle class hoped to emulate the aristocracy as a symbol of their own prominence.

Victorian social change was a major cause of the popularity of electroplate. Within industrial cities like Manchester, efforts were made to educate the middle class in art, music, philosophy, and literature. Because they were immersing themselves in subjects associated with the aristocracy, the middle class began to question the power of the land class. The middle class were now the workers who created the backbone of the major cities in the empire and they felt that cities did not necessarily have to rely on the wealth of the aristocracy.⁹⁷ To assert themselves as a new, self-made class, the middle class used their knowledge of art to emulate the aristocracy. Portraits of the aristocracy included silver settings that displayed their wealth and cultivation.⁹⁸ A photograph of a middle-class family seated around a table set with silver or electroplate shows that the new class used silver's connotation of wealth and power to their own advantage (comparative plate 18).

The dispersal of silver from wealthy homes also made the classes desire electroplate as status symbols. As a result of the fluctuation and decline of the price of the silver ingot, silver stopped being a good investment. The aristocratic class who depended on the wealth of their land and inheritance for a living also decided to place the money invested in their silver plate into other areas. A 1849 issue of The Tablet reported that electroplate was replacing silver: 'Old families are turning their plate into this new security and some of the noblest names are among the patrons.'⁹⁹

Electroplate appealed to the wealthy and the middle and lower classes bought electroplate to emulate the tastes of the upper classes. When electroplate was first produced, the price of the products were expensive. For example, a candelabrum like the one made by T.J.& N. Creswick cost around £30¹⁰⁰ while a designer in a large electroplate shop earned around £7 a week.¹⁰¹ Although the prices were greatly reduced in later years, the high prices attracted wealthy clients who wanted to avoid cheap commodities.¹⁰² As electroplate became more affordable, the middle and lower classes were excited to buy examples praised by the upper class. Britannia metal, a variety of pewter composed of tin, antimony and copper, was used as a base for electroplate to allow the lower class to aspire to the classes above them. An electroplate teapot made in 1850 shows that Britannia metal was a thin, soft metal that was easily dented (catalogue plate 5). Because it was easily damaged, Britannia metal was very inexpensive and accessible to the lower class.¹⁰³

Elkington's first catalogue to present electroplate demonstrates how customers used style to advertise their wealth (comparative plate 19). The catalogue, published in 1847, shows examples of Rococo revival designs in the cartouche-shaped tureens decorated with foliate scrolls like the stamped ornament on the Britannia metal teapot. Elkingtons used these elaborate designs to show how the process had improved upon the capability of Sheffield Plate.¹⁰⁴ The elaborate designs not only reflected products patroned by the eighteenth century aristocracy, they also outdid those designs. While eighteenth Rococo ornament used scrolls and

organic curves, the Elkington's tureen combines Rococo design with naturalistic forms. The vine and grape decoration that entwines the handle of the tureen in the middle exploits naturalistic style popular in the nineteenth-century.¹⁰⁵ The combinations of ornament were made by the new processes involved with electroplating that allowed manufactures to show the advancement of their technology. The elaborate results pleased the middle class as well, for the emphasized decoration drew attention to their plate and their status.¹⁰⁶

The most effective way for Victorians to show off their plate was by presenting it at elaborate meals. In the Victorian household, a feast complete with a set of silver cutlery and candlesticks was the mark of a well-ordered household.¹⁰⁷ Because the man of the house often supported the family by going to work everyday, the Victorian family became stratified into distinct roles. Social rules dictated that the wife provide order to the home.¹⁰⁸ Women referred to Mrs. Beeton's Book of Household Management for illustrations on how to create the perfect setting for tea and a silver display was a major part of social etiquette (comparative plate 20). Books like Cookery and Domestic Economy for Young Housewives, also gave advice to women of the rising middle class who took on more responsibility in the home. Foremost among its teachings was that a dinner should be served on a well-set table complete with 'silver forks, spoons, and a teapot.' If the family could not afford other articles like silver candlesticks, it was recommended that the family use 'plated [articles] on nickel or electrotyped'.¹⁰⁹ For families unable to buy silver cutlery, electroplated forks and spoons were affordable purchases. However, many families owned servants who frequently polished the silverware, including electroplate, and the silver coatings often wore away quickly. Families, nevertheless, could bring their cutlery to a jeweller or silver shop to get their wares re-plated.¹¹⁰

Electroplate also became an important part of household dinner parties and social gatherings. In Our Mutual Friend, Charles Dickens commented on the way elaborate silver services decorated like the ones advertised in the 1847 Elkington's catalogue contributed to the way a family displayed its wealth. Dickens's description of the Podsnap's table shows that

wealthy upper-middle class families used silver to brag about their riches: “Everything said boastfully, ‘Here you have as much of me in my ugliness as if I were only lead; but I am so many ounces of precious metal worth so much an ounce;- wouldn’t you like to melt me down?’¹¹¹

A drawing by Marcus Stone, illustrator of Our Mutual Friend, refers to this ornate design in a picture of dinner at the Veneering’s house (comparative plate 21). As their name suggests, the Veneerings were a *nouveaux riche* family that aspired to the tastes of the wealthy.¹¹² As the tall epergne decorated with a camel and tree indicates, the Veneerings used silver, in this case probably electroplate, to indicate their affluence. Dickens also criticized the use of many stamps and overall decoration in his observation of the Podsnap’s epergne, stating that it was ‘blotched all over as if it had broken out in an eruption rather than been ornamented’.¹¹³ Although richly decorated items were symbols of new technology and statements of wealth, Dickens modelled his comments on design reformers who felt that ornate Victorian aesthetics, which often combined historicist styles, were examples of bad design.¹¹⁴ The *Design* section of the exhibition explores how marketing affected ideas of good design.

□ *New Markings*

Because of the increased interest in buying silver and plate, consumers became aware of identifying silver and its imitations by examining how they were marked. The dispersal of historic plate from the landed classes created opportunities for dealers to exhibit silver in public places. Opportunities for consumers to examine traditional plate increased in the latter half of the century.¹¹⁵ Continuing exhibitions that featured silver collections were held at the Museum of Ornamental Art (later the Victoria and Albert Museum) and other museums in cities like Manchester and London.¹¹⁶ Perhaps the first exhibition where silver hallmarks were explained was the *Conversazione* at the Ironmongers' Hall in 1861 (comparative plate 22). Here, livery companies, dealers and private collectors allowed visitors to examine and discuss their collections.¹¹⁷ Because electroplate resembled silver, electroplate manufacturers were barred from using silver marks in order to prevent them from deceiving customers.¹¹⁸ This section compares the markings of silver and electroplate and explores how electroplating factories upset the metal industry through their methods of marking.

In order to understand why electroplate manufactures caused disruption within the metalwork industry, it is necessary to explain how silver was hallmarked. From the fourteenth century, British silversmiths were required to stamp their wares with specific marks that showed they were genuine.¹¹⁹ Three decanter stoppers made for Summerly Art Manufactures in 1855-6 show that a total of five stamps were required on Victorian silver (catalogue plate 6). Firstly, the stoppers are marked with a lion passant, signifying that they are made of 92.5 percent silver, the required amount as dictated by British law (comparative plate 23). Secondly, they are marked with the town mark of a leopard's head as a sign that it was assayed in London.¹²⁰ The stoppers were also required to be marked with the initials of the maker, in this case SSWN for Smith and Nicholson, and a date mark indicated by letter (a lower-case Gothic a) showing that it

was made in 1856. Finally, the stoppers are stamped with a bust of Queen Victoria that signifies that the excise duty had been paid on the objects. Assay offices used this mark between 1784 and 1890 and the tax was determined by the weight of the article.¹²¹

The assay offices were infuriated because electroplaters, like the Sheffield plate industry, used marks that looked similar to silver hallmarks. This is most evident in a sugar bucket made by James Dixon and Sons which is stamped E.P.B.M., initials indicating that it was made from electroplated Britannia metal (comparative plate 24). Because each letter is stamped in a separate shield, the marks resemble silver hallmarks. Likewise, the initials E.P.N.S. were used to stand for Electroplated Nickel Silver.¹²² Other marks enraged the silver industry. Many electroplaters, including Elkington's, used a crown as part of their mark. Because the Sheffield assay office also used a crown to mark silver, the Guardian of the Sheffield Assay Office threatened legal action in 1896.¹²³

Although electroplaters continued to simulate silver marks, the Design Act introduced marks that distinguished a difference between electroplate and silver. The Design Acts of 1839 and 1842 gave manufactures patent rights for their original patterns for a period of up to three years. This act was appreciated by Elkingtons who relied on their designs to remain at the top of the industry.¹²⁴ From 1842 to 1884, a diamond was marked on electroplate to indicate the registry number of the pattern along with the month and date it was registered.¹²⁵ A teapot designed by Christopher Dresser for James Dixon & Sons shows a stock number, used by the company to organize their inventory, above the diamond (comparative plate 25). However, the initials of James Dixon & Sons printed above these numbers shows that electroplaters continued to simulate silver hallmarks and each letter is marked in a shield.¹²⁶ Though the informed buyer could distinguish between silver and electroplated marks, the metalwork industry was concerned that the consumer uneducated in the markings would be at a disadvantage and might believe that electroplate was sterling silver.

Chapter 3: Design: From Challenging to Embracing Electroplate

The Great Exhibitions and the Dilemmas of Design

□ *Felix Summerly: Questioning Design in Industry*

As stated in *Symbols of a New Class*, critics like Engels and Dickens felt that mass production caused the deterioration of metalwork design. In *Our Mutual Friend*, Dickens attributes the use of new technology to the over-blown decoration on Mr. Podsnap's epergne. Although ornate decoration was a symbol of industrialization and the rising middle class, many critics believed that British design standards were declining in comparison to other European nations. Attempts to improve commercial design in Britain began in the eighteenth century when the Royal Society of Arts awarded manufacturers for well-designed products.¹²⁷ As part of his wish to improve the design of manufactured goods, Henry Cole, an enthusiastic civil servant, set up an organization under the pseudonym Felix Summerly to promote public taste and exhibited products in the Society of Arts.¹²⁸ This section explores Henry Cole's organization 'Felix Summerly's Art Manufactures' and its role in creating the Victorian aesthetics that influenced electroplate design.

At the core of Cole's initiative was the desire to merge the fine arts with industry.¹²⁹ One of the most important problems that Cole wanted to remedy was the poor education available to British industrial workers. Although design schools were set up in cities around the nation, they failed to create an overwhelming improvement in the design and craftsmanship of industrial products.¹³⁰ Because of the inadequacy of these institutions, industries often employed foreigners like the French to design their products and produce craftsmanship.¹³¹ The lack of good British craftsmanship, Cole believed, contributed to consumer desire for foreign styles. Cole thought that if industry produced well-designed goods, it would educate consumers in good taste and create faith in British products.¹³²

Although Cole's ideas involved all mediums, his concerns towards design were greatly influenced by metalwork and electroplate. Cole felt that Rococo and naturalistic ornament in the form of scrolls and flowers was added to Victorian silver without becoming integral to the forms.¹³³ Knight's Vases and Ornaments, published in 1833, was a major influence on naturalistic design used on silver (comparative plate 26). Cole observed that the abundance of naturalistic ornament drawn in Knight's patterns were unrealistic in metalwork, for the ornament created a heavy and cumbersome product. The ornament, Cole believed, also drew attention away from the functional use of the object.¹³⁴

The major aims of Cole's Summerly venture, therefore, were to merge art and function and to produce objects of utility that were not overcome by ornament. To advertise his ideas concerning design, Cole published General Principles of Decorative Art. The major themes of ornament in the publication were that ornament should arise from construction, that it be inspired by nature, that it be second in priority to utility, and that ornament be appropriate to material.¹³⁵ Though many manufactures contributed to the project, Cole himself was dissatisfied with some of the outcomes. Firstly, Cole found that most designers were unfamiliar with the materials for which they made patterns, affecting the utility of the objects.¹³⁶ Cole also found that designers failed to follow his guidelines of good design. In the Journal of Design, Cole criticized a design for an electroplate tea service made by John Bell (comparative plate 27), stating that the naturalistic ornament did not arise from the shape of the objects: 'The ornament seems adapted with scarcely sufficient study, it springs from nothing, and its leaves are absolutely cut off by the line of the base'.¹³⁷

Though Cole was unhappy with the use of naturalistic ornament in Summerly designs, he praised the use of classical ornament on metalwork, which tended to be used sparingly.¹³⁸ The electroplate versions of the three decanter stoppers discussed in *New Markings* were published in a Summerly catalogue and are exemplary of Summerly designs (comparative plate 28).¹³⁹ The statuettes follow Summerly's design principles, for the wine-harvesting putti are

appropriate to the function of the wine-stoppers. Many designs created in the mid-Victorian period, however, included representations appropriate to the article's function.¹⁴⁰ Nevertheless, Cole's principles reflected the critiques concerning electroplate design. Though Summerly's electroplate designs were criticized, Cole's principles influenced other design reformers and encouraged them to consider art in industrial design.

□ *The Great Exhibition: Past or Present Aesthetics?*

Cole's arguments surrounding metalwork design greatly influenced the reception of electroplate at the 1851 Great Exhibition at the Crystal Palace in Hyde Park, London. The plans for the Great Exhibition were headed by Prince Albert and Henry Cole.¹⁴¹ In 1846, Prince Albert, president of the Society of Arts, awarded Henry Cole for his Summerly designs for the ceramic firm Minton.¹⁴² Both men found that they had similar ideas concerning industrial design. Both also felt that the Great Exhibition would educate industrial workers and designers in good craftsmanship and artistic design in order to produce quality goods.¹⁴³ They believed that an exhibition showing international examples of industrial products would in turn educate consumers in good product design and encourage them to purchase items in good taste.¹⁴⁴ The Great Exhibition's critics, including A.W.N. Pugin, raised new arguments concerning electroplate design. Firstly, the judges compared new technology to traditional craftsmanship and questioned electroplate as an art form. Secondly, the examples of electroplate in the Great Exhibition also provoked questions concerning the design of new technology.

One of the major arguments raised in the Great Exhibition was whether or not electroplate should be admired as an art form. The main purpose of the exhibition was to combine art with technology. The most prominent example was the Crystal Palace itself, constructed of iron beams and glass and easily assembled because of its modular structure (comparative plate 29).¹⁴⁵ Electroplating factories like Elkington's made prominent displays of their electrotypes and electroplate in hopes that the jury would appreciate the merits of their technology. The Jury's response, however, was unenthusiastic. Although the Jury praised the invention of electro-gilding because it 'preserved the health of the artisan' unlike mercury gilding, it was cautious in its approval of silver electroplating.¹⁴⁶ Though electroplating was well established by 1851, the Jury found that the technique was connected to trade that

competed with traditional plating and silverwork: 'we desire to guard against being considered as expressing an opinion on the merit of the application of the electro-process of silver plating to objects of domestic use'.¹⁴⁷

The Jury's uncertainty towards electroplate may have been linked to the fact that traditional craftsmanship was more likely to be favoured for its artistic merit than new technology. Though the Exhibition was designed to explore the link between technology and art, many design reformers argued that technology was detrimental to art. This view was directed especially towards metalwork, as seen in A.W.N Pugin's *Medieval Court* (comparative plate 30). Pugin praised the use of new technology if it benefited the worker and he authorized electro-gilding and electroplating to appease his customers in his partnership with John Hardman and Sons.¹⁴⁸ Pugin's predominating ideal, however, was that an artwork should express the spirituality of its maker.¹⁴⁹

This ideal is embodied in a chalice designed by Pugin for John Hardman and Sons that was presented at the 1851 Exhibition (catalogue plate 7). The chalice bowl was raised by hand and the interior of the bowl was mercury-gilded. Careful attention was used to set amethysts into the knop and to enamel the quatrefoils on the base of the chalice. Pugin agreed with the ideas of John Ruskin who believed that the division of labour and mass-production destroyed the relationship between the worker and his product.¹⁵⁰ Pugin looked to Gothic examples to inspire work like the chalice because he believed that Medieval craftsmen were closer to God through their work and that surrounding oneself with Christian symbols would create inner spirituality.¹⁵¹

Pugin's ideas, however, did coincide with Cole's criticisms of British design represented at the Exhibition. Though Pugin was admonished for copying Gothic design, he expressed his concern for the low standard of British design.¹⁵² Pugin's design standards were similar to Cole's and he believed that decorative art should be true to construction, that ornament should be relevant to construction, and that the true nature of the material be

exploited.¹⁵³ Pugin also criticized Sheffield and Birmingham products in the Exhibition for the uneducated and over-elaborate use of historic ornament.¹⁵⁴

An electrogilded and electroplated cakedish by the Birmingham firm William Gough & Son exhibited at the Crystal Palace is an example of what Pugin found disgraceful (catalogue plate 8). The design combined Renaissance and Gothic styles and Pugin felt that the mixture of styles was dishonest to pure Gothic ornament: 'If they only introduce a quatrefoil or an acute arch, be the outline and style of the article ever so modern and debased, it is at once denominated and sold as Gothic'.¹⁵⁵ Secondly, Pugin also believed in the simplicity of ornament that follows construction and argued against the addition of ornament that was not necessary to construction, as displayed in the arches of the cake dish. Finally, the object does not reveal its true construction because the electroplated silver covers the copper core and the elaborate decoration draws attention away from the form of the object.

Though critics like Pugin felt that art and technology should remain separate, Cole and Prince Albert believed that it was possible to successfully merge the two areas.¹⁵⁶ A jewel casket made by commission of the Prince and exhibited at the Great Exhibition shows that electroplating represented the power of the Victorian Empire (comparative plate 31).¹⁵⁷ The casket was designed for Prince Albert by Ludwig Gruner and was surmounted by electrotypes made by Elkington's for the royal collection.¹⁵⁸ For Prince Albert, electroplating was a sign of Britain's role as the leader of the Industrial Revolution. Although British design was criticized, elaborate historical ornament emphasized the nation's technological innovations through the use of stamps and electroplate. The casket also presents Britain's esteem through the miniature enamel portraits of Queen Victoria and Prince Albert in medieval costume.¹⁵⁹ To the Victorians, British chivalric themes were symbolic of the peace and prosperity of their own nation. The inclusion of this theme on the casket indicates that electroplating contributed to the idea of Britain as a powerful, idyllic Empire.¹⁶⁰ However, the contrast of past and present aesthetics demonstrates that the Great Exhibition produced contradictory views towards the new

technology and these contradicting themes would set examples for future designers and International Exhibitions.

□ *The Example of Electrotypes*

The Great Exhibition proved to be very successful among the public and it generated a £186,000 surplus.¹⁶¹ Prince Albert and Henry Cole agreed that the money go to serve the purpose of the Exhibition. Therefore, a museum was built in South Kensington to hold industrial objects that set examples of good design. The South Kensington Museum opened in 1857 with Henry Cole as its first director.¹⁶² Cole wanted to provide a vast collection of both historical and contemporary designs for study purposes and used electrotypes to this end in the new Museum. Because electrotypes were copies of existing metalwork, Cole realized that the process could produce replicas of art found in historical collections throughout the world.¹⁶³ As the Museum's collection of electrotypes continued to increase, students benefited from examining objects and comparing styles from different time periods and countries.

Electrotyping was a by-product of electroplating and the process was praised by a 1846 Art Journal for its accuracy in copying existing metalwork: 'The electrotypes are perfect; the finest lines, the most minute dots are as faithfully copied as the boldest objections'.¹⁶⁴ The electrotyping process was a modification of electroplating. Silicone rubber moulds were taken from the original metalwork, often of separate sections of the piece. The mould was made conductive by rubbing powdered silver onto the surface. The mould was placed into the plating bath and attached to electrodes and copper was deposited onto the conducting face of the mould. After a few hours, a sufficient amount of copper thickness was produced and the mould was removed. Sections were then electroplated and soldered together and soft solder was added to give the object weight.¹⁶⁵

As one of a pair of electrotyped Leopard Flagons shows, electrotypes allowed students to examine and compare works of art that they would not otherwise have the means to see (catalogue plate 9). The Leopard was copied from an English silver-gilt original made for

Charles I in 1600-01.¹⁶⁶ The South Kensington Museum was interested in the leopard because it was part of a collection that Charles I sold to the Tsar of Russia in 1627. By bringing an electrotype of the leopard into the Museum, students and visitors could learn about British history and design.¹⁶⁷ As a close-up of a leopard's head shows, electrotyping was capable of copying minute details and the small lines that make up the leopard's hair could be examined by students.

The Leopard was also a result of a Convention organised by Cole at which fourteen European countries agreed to exchange works of art. The most ambitious trip, to Moscow and St. Petersburg in 1880, secured copies of over 200 items from the Kremlin and the Hermitage. The trip was headed by Mr. Sarti, Elkington's most experienced modeller, and Mr. Maskell, a representative of the South Kensington Museum. Letters sent by the two men to South Kensington reveal that their trip was not met without difficulties. Firstly, both men could not speak Russian. Secondly, the Russians were extremely suspicious of them handling the objects and accused that the moulds had ruined the patina on their Renaissance silver. Elkington's also made trips to public and private collections in Sweden, Denmark, France, Italy and other countries on the museum's behalf.¹⁶⁸

The electrotypes also served as specific teaching tools, especially as examples of Renaissance ornament. Because the jury of the Great Exhibition had criticized objects loaded with Rococo ornament, many designers turned to the restrained classical manner that was celebrated in the Elkingtons display.¹⁶⁹ The London-based Italian silversmith Signor Franchi also supplied many of the museum's electrotypes and made plaster casts for the museum from Italy.¹⁷⁰ One of the most influential examples of his work is the Doors of Paradise, originally made in 1425-52 by the Renaissance artist Lorenzo Ghiberti (comparative plate 32). In the 15th century, the Doors were praised for their display of symmetry, realistic rendering of space and portrayal of human emotion.¹⁷¹ Cole, too, admired these qualities in workmanship and used Renaissance examples like the Doors to influence contemporary designers.¹⁷²

The South Kensington Museum also celebrated examples of nineteenth-century design. Because of the success of French design in the Great Exhibition, many firms were anxious to secure foreign designers in their firms.¹⁷³ Among the most admired designers was Leonard Morel Ladeuil, a French modeller who headed the design staff at Elkingtons in the 1860s.¹⁷⁴ Morel Ladeuil's Milton Shield, representing scenes from John Milton's *Paradise Lost*, was awarded the gold medal at the Paris Universal Exhibition of 1868 for the virtuoso craftsmanship of the artist (catalogue plate 10).¹⁷⁵ The South Kensington Museum acquired electrotypes of the Shield made by Elkington's because the shield, inspired by Renaissance design, was a good example of creativity and workmanship in its modelling and chasing.¹⁷⁶

The Shield is also an example of how electrotypes were marketed by the Museum. Although Elkington's was denied the exclusive rights to reproduce works for the South Kensington Museum, the firm was allowed to sell electrotypes like the Shield to the museum at market price.¹⁷⁷ The Museum also served as an advertisement for Elkington's electrotypes and museum visitors could purchase electrotypes like the Shield. Because consumers were buying products praised as good design, the process of selling electrotypes at the South Kensington Museum supported Cole's ideas towards production and consumption.¹⁷⁸ To avoid breaking hallmarking laws, all marks were to be deleted from the electrotyped copies. Items made by Elkington's were then stamped with a seal bearing their name and the monogram of the Science and Art Department.¹⁷⁹ Electrotypes were also sent around to design schools like the Birmingham Guild of Art to provide educational examples.¹⁸⁰ By the 1920s, the Victoria and Albert Museum had acquired over 1000 electrotypes for the benefit of design education.¹⁸¹

□ *Embracing New Technology: Later Exhibitions and Electroforming*

While the Jury of the Great Exhibition hesitated in their praise of electroplating, the Jury of the International Exhibition of 1862 openly admitted that their predecessors had been wrong to criticize the process. In the 1862 Exhibition electroplate was admired for its 'advantages, now so generally admitted'.¹⁸² Many designs in the International Exhibitions that took place in the latter half of the nineteenth century were inspired by historical styles.¹⁸³ However, the new respect for electroplating may have been linked to innovative designers who combined technology and the fine arts in creative ways. This is best observed in electroformed triumphs that were shown at major Victorian exhibitions. The process is very similar to electrotyping. Electroforming, however, deposits metal into plaster moulds of original designs instead of copies of existing designs.¹⁸⁴ The process enabled electroplating firms to create original designs and electroforming symbolized both the evolving ingenuity of electroplating and the Victorian Empire.

The 1862 exhibition differed from the Great Exhibition in the respect that it featured more displays of architecture and the fine arts. The exhibition, nevertheless, was also dedicated to examples of good industrial design that combined the fine arts with technology. The Hereford Screen, designed by Sir Gilbert Scott, was considered to be a prime example of the merging of the two spheres (comparative plate 33).¹⁸⁵ The screen, an eclectic combination of gilded and painted ironwork, brass, copper, and mosaic was made from all of the industrial metalwork techniques available. The details were made of cast iron and electroplating was used on the gilt and silver details. Electroforming was used to create original designs for the statues of Jesus and the angels.¹⁸⁶

Placed in a prominent position under the arches of the Court in the Exhibition, the Hereford Screen was admired for its successful combination of fine arts and technology. The

Illustrated London News hailed it as ‘the grandest, most triumphant achievement of modern architectural art’.¹⁸⁷ The screen served a functional purpose of separating the nave of the Hereford Cathedral from the chancel, and the congregation from the clergy. Function was combined with art and technology because Scott’s Screen was an example of the Gothic Revival. By the nineteenth century, medieval screens had disappeared in cathedrals and Scott wanted to update the use of the screen by using iron rather than stone or wood because he felt that it was a ‘modern’ material.¹⁸⁸ The use of modern materials upholds the Victorian idea that the Gothic was an epoch of artistic expression. The use of new technology in the Hereford screen, therefore, shows Victorian art on equal ground as their medieval counterparts.¹⁸⁹ Followers of John Ruskin and Pugin may have disagreed with the application of technology in a religious, Gothic-inspired artwork. The Screen, nevertheless, upheld the values of the Exhibition and showed Britain as a leader in technology.

A Japanese style electroformed vase exhibited by Elkington’s at the 1876 Philadelphia Centennial Exhibition was purchased by the South Kensington Museum for its technical ingenuity and good design (catalogue plate 11).¹⁹⁰ The vase is a unique example of originality in the last decades of the nineteenth century. From the 1860s, the metalwork trade was dominated by traditional designs because consumers found it safer to invest in lasting styles and manufactures did not want to buy expensive dies to keep up with new styles.¹⁹¹ The 1862 International Exhibition in London was one of the first times that Europeans saw Japanese art since the reopening of trade with Japan in the 1850s.¹⁹² Eastern design had a profound effect on Victorian aesthetics. A major response to the popularity of Japoisme was for manufactures to engrave or stamp popular Japanese motifs like bamboo on metalwork.¹⁹³

Elkington’s, however, was one of the few firms to experiment with new styles and innovative methods. Elkington’s was aware that Japanese ceramics had started to take over the silver trade.¹⁹⁴ The display of blue and white porcelain in the Peacock Room designed by James Abbott McNeill Whistler shows that the popularity of Japanese ceramics stemmed from

the Aesthetic movement (comparative plate 34).¹⁹⁵ The trade with Japan also brought examples of cloisonné enamel like a Japanese vase made in 1881 decorated with stylised flowers and insects (comparative plate 35). Elkington's capitalized on the stylised, nature-inspired forms and colours of the Aesthetic Movement by creating a new method of using cloisonné enamel on electroformed copper-gilt.¹⁹⁶

In efforts to produce cheaper versions of cloisonné enamel that did not have to be imported from the Far East, Elkington's showed ingenuity by creating a process that reduced the amount of labour involved in the process. Japanese enamellers used traditional cloisonné wire techniques in which the enamel was poured into compartments formed by a network of metal bands on the surface of the object.¹⁹⁷ Elkington's, however, replicated this effect through the use of the *champlevé* enamel technique. The vase was electroformed into a mould that created cavities for the enamels. After the vase was electro-gilded, Elkington's enamellers used imported Japanese enamels to fill in the cavities (see lower right hand corner of catalogue plate 3). The project, however, lasted from the 1870s to 1880 because the company found it cheaper to import Japanese metalwork.¹⁹⁸ The vase, nevertheless, represented Victorian Britain's awareness of the world and its role as a leader of the Industrial Revolution.

Innovative Aesthetics

□ *Designed for Industry: Christopher Dresser*

Christopher Dresser was a radical designer that used the ideas of Cole and other design reformers to successfully combine utility and design in electroplate. Dresser's work was prolific and he created designs for Elkington's, James Dixon & Sons, Sheffield and Hukin & Heath, Birmingham from the late 1860s until the end of the century.¹⁹⁹ Like many design reformers, Dresser felt that the design of mass-produced silver plate was waning in the latter half of the century. The 1860s saw the resurgence of the Rococo Revival and Dresser felt that this kind of British design took over the form and function of metalwork.²⁰⁰ Dresser was taught under Cole's system of education at the Government School of Design in London from 1847-1854.²⁰¹ However, he created designs unlike any other Victorian manufacturer and was able to unite simple aesthetics, function, and technology in his electroplate.

Much of Dresser's attention to industrial design stemmed from his knowledge of science and design. Dresser was enthusiastic about Cole's idea to wed science and art.²⁰² Dresser, however, wanted to explore these ideologies in new ways. To this end, Dresser specialized in botanical studies.²⁰³ As a botanist, Dresser was sympathetic to Pugin's belief in ornament as a basis of design but believed that the Neo-Gothic style was not appropriate for a modern Protestant Britain.²⁰⁴ Like other designers of the second half of the nineteenth-century, Dresser was influenced by Owen Jones' Grammar of Ornament, which stressed design that was close to the ideals of Cole and Pugin.²⁰⁵ Jones, too, believed in honesty of construction, the simplicity of ornament that was relevant to construction, and the truth to materials.²⁰⁶ Dresser himself was a contributor to The Grammar of Ornament but provided drawings from his observations of flowers that were scientific studies of nature.²⁰⁷ This educated mix of science and design set Dresser apart from other design reformers of his day.

Foremost on Dresser's agenda was to create silver that was well designed for easy mass-production and inexpensive for the consumer.²⁰⁸ Dresser's ideas mirrored those of the Summerly proposals in that he considered the best method of showing the honesty of the material before him.²⁰⁹ A tangible example of Dresser's beliefs is an electroplated nickel silver teapot he designed for James Dixon and Sons in 1880 (catalogue plate 12). In the 1871-2 article titled 'Principles of Design' in The Technical Educator, Dresser wrote that a sheet of silver or gold should be used conservatively in thin sheets because they are 'materials of considerable worth'.²¹⁰ Indeed, the teapot is composed of thin metal and electroplating also conserved the amount of metal deposited for cheaper production and consumption. Dresser was also aware of the utility of the object as evidenced in his statement that thicker metal would be 'heavy' and cumbersome to hold.²¹¹ To insure that the thin metal would 'possess sufficient strength,' Dresser added a handle formed at an angle to the body to balance the weight of the body of the teapot.²¹²

Dresser's designs were enforced by his knowledge of science. The handle is formed at an angle so the user would only have to tilt the teapot a little to pour the tea. Dresser tested his designs so that the product would be ergonomic.²¹³ Designs like the teapot were therefore based on the geometry and science that Dresser learned while studying nature, as shown in Dresser's study for another teapot (comparative plate 36). Simple geometry contributed to the overall design of the product, the ease with which it could be manufactured, and the manifestation of his ideal in the honesty of construction. The teapot's body was made in a spherical shape by spinning the nickel silver on a lathe before it was electroplated, as evidenced by the rings inside the teapot created by the lathe. The geometry of the round body was therefore used for fast mass-production. The handle and feet were also designed for industry, each attached by grasps screwed onto the body by small nails. The honesty of the teapot's construction is exploited for industrial use, for the nails could easily be inserted by machine.²¹⁴

The teapot is also an example of Dresser's belief that ornament should be relevant to construction. The ornamentation of his work, including the teapot, is limited to the geometry and necessities of construction itself. Dresser condemned the elaborate ornament in contemporary design and placed the utmost importance on form, believing that ornament was subservient to function.²¹⁵ In his diagrams of the dissection of plants, Dresser discovered superior beauty in the symmetry and geometry of nature.²¹⁶ This beauty is reflected in the design of his teapot, placed in the spheres of the body and finial and the linear rectangles of the spout and legs.

Dresser's aesthetic ideals are also linked to his interest in the art of Japan. While other artists of his day added Japanese motifs on their products, Dresser admired Japanese metalwork for its simple geometry and nature-inspired ornament.²¹⁷ True Japanese ornament mirrored Dresser's ideals of exploiting the material and construction of the object.²¹⁸ Dresser travelled to Japan and bought Japanese ceramics and metalware for Liberty's, London and Tiffany's, New York and became one of the largest exponents of Japonism in Britain.²¹⁹ His travels also inspired his own work, as shown by a Japanese tankard imported by Dresser that was published in The Furniture Gazette (comparative plate 37).²²⁰ Like the handle on the tankard, Dresser's handle is of a simple geometrical shape of an ebony-like rod made of painted wood that is clenched by two metal grasps. The Japanese use of ebony and ivory in metalwork suited Dresser's idea that the decoration of an object be limited to the construction, for their matte colours offset the reflective quality of silver. Dresser's use of painted wood is also an example of his beliefs in creating affordable and utilitarian wares, for the wood is less expensive than ebony and allows the user to hold the teapot without transferring heat to his hands.

The avant-garde and the Aesthetics admired the simple designs and colours of Dresser's works and many manufactures copied his designs.²²¹ Dresser's metalwork also inspired future generations and exemplified the basic design ideals of Cole, Pugin and Jones.²²² Dresser's interests in science and art were suited perfectly for improving design technology and the

British Empire, for he believed that good design led to improved trade: 'to the nation it saves impoverishment'.²²³ Dresser's designs set him apart from designers who embraced traditional values as will be explored in the next section.

□ *New Styles and Traditional Values: The Arts and Crafts Response*

The debates between technology and traditional art continued into the end of the nineteenth century. In the 1880s, the Arts and Crafts Movement, headed by the ideals of John Ruskin and William Morris, was founded as a response to the dehumanising effects of mass-production.²²⁴ Ruskin and Morris were inspired by Gothic and Medieval art, believing that the styles represented a connection between the artist and his work which had evaporated with Victorian division of labour.²²⁵ One of the major proponents of the Arts and Crafts Movement was Charles Robert Ashbee. To bring the artist closer to his work, Ashbee set up the Guild of Handicraft, a school where young, often inexperienced silversmiths were trained in traditional methods of metalwork.²²⁶ Ashbee, like Morris, was inspired by historical art.²²⁷ His main desire, however, was to create an innovative aesthetic that broke away from the historicism of the latter half of the century.²²⁸ In this respect, Ashbee's ideals were similar to Dresser's and this section explores how the aesthetics of the two design reformers were linked and how their views towards mass-production differed.

Although Ashbee disagreed with the division of labour, his electroplated wares like a muffin warmer made in 1898 show that he was not completely opposed to technology (catalogue plate 13). Ashbee's interest in electroplating seems to have stemmed from his visits in 1896 and 1901 to the Gorham Manufacturing Company in Rhode Island, United States of America.²²⁹ Here, Ashbee found that the technology and factory working conditions of the New World was surpassing that of Britain. In 1901, Ashbee noted that, 'The application of machinery has been carried to a pitch of excellence and precise skill in its use for the making of silver ware, which no firm in England can come anywhere near'.²³⁰

Ashbee, nevertheless, believed that the level of craftsmanship produced by his Guild could not be found in America.²³¹ Ashbee was opposed to the division of labour and believed

that an artist should create a unique product from the beginning to the finished product.²³² A photograph of the assembly line of men operating drop presses at Gorham's (comparative plate 37) is a contrast to the free-discussion and hands-on approach of the workers in a photograph of Ashbee's Guild (comparative plate 38). Ashbee's view towards the division of labour is evidenced by the unique characteristics of the electroplated muffineer. The surfaces of the muffineer exhibit planishing marks created by the soft touch of a hammer used by the Guild to even the surface of the silver. According to Ashbee's philosophy, the Guild members worked a piece from beginning until end to create a work that was their own and this appears to be true for their electroplate.

This technique, however, prohibited Ashbee's Guild from becoming a financial success. Although Ashbee's electroplated wares cost about five times less than their silver counterparts, the firm's attention to handicraft meant that it could not produce the large numbers of products made capable by mass-production.²³³ Ashbee's hands-on initiative differed from Dresser's enthusiasm to cater his designs for industrial production. Ashbee's Guild approach, therefore, was not able to support a business because his prices were very high compared to goods manufactured by large industries. This, in turn, caused the collapse of Ashbee's business in 1907.²³⁴

Like Dresser, Ashbee took pride in creating original designs. Both designers were influenced by the three major concepts shaped by Cole, Pugin, Morris and Jones: truth to material, and honesty of construction, and ornamentation relative to construction.²³⁵ These ideals are evidenced by the design of the electroplated muffineer. Ashbee admired the appreciation of the past shared by Cole and Pugin and borrowed historic plate from the South Kensington Museum to teach the members of his Guild.²³⁶ The use of a cabochon chrysoprase set onto the wire-worked handle was influenced by Pugin's work like his medieval-inspired chalice created for the Great Exhibition.²³⁷ Ashbee was attracted to the traditional

craftsmanship exemplified by use of enamel plaques and the semi-precious stones amethysts in Pugin's Gothic-inspired chalice.²³⁸

While Pugin's chalice is truer to medieval design, Ashbee applied the traditional style to an updated form. The wire-work handle, a common motif of Ashbee's work, was inspired by the whiplash, organic curves of Art Nouveau.²³⁹ This shows that Ashbee wanted to create designs relevant to his own day.²⁴⁰ The ornament of the electroplated muffineer is mainly limited to the functional features of the object, as in Dresser's designs. Ashbee's metalwork designs, however, were not ideally suited for utility. The wire-work is quite delicately applied and when the cover is lifted, it does not seem strong enough to support the weight of the cover's base. The ornament on the silver version, as in many of Ashbee's designs, is not only limited to functional areas (comparative plate 40). Ashbee placed four oval cabochon turquoises around the rim of the muffineer's base. The ornamentation, therefore, serves the purpose of providing delicate aesthetics to Ashbee's designs and do not create ergonomic objects.²⁴¹

Ashbee's ideals were nevertheless linked with Dresser's desire to show truth to material and construction to give an innovative aesthetic. Dresser was concerned with the nature of silver and embraced electroplate for its accessibility. However, Ashbee's muffineer draws attention to the traditional methods of craft in the soft sheen of the metal created by the planishing marks struck throughout the piece. Although the designers differed in their approach to technology, both used the shine of the silver on electroplate to set off the colours of the cabochon or ebony in their pieces.²⁴² The truth to the metal, therefore, was also used as an aesthetic effect. While the construction of Dresser's teapot was ideal for industrial manufacture, the honesty of construction in Ashbee's muffineer drew attention to the traditional methods praised by his Guild. The muffineer was composed of three delineated sections: the handle and bowl of the cover and the plate base. The bowl shape of the cover was the ideal form to be raised by the hand of the worker and the plainishing marks are also the signature of the artist.

Though Dresser and Ashbee were united in their desire for innovative aesthetics, Dresser's electroplate designs were better suited for utility and production for a wide-audience. This fact was noticed by firms wanting to capitalize on the vogue for Arts and Crafts aesthetics. To Ashbee's dismay, the London shop Liberty's produced industrial electroplated items borrowed from Ashbee's original designs.²⁴³ However, the Birmingham Guild of Handicraft kept true to Ashbee's ideals of workmanship, using electroplate and industrial methods in a guild environment.²⁴⁴ The arguments for and against electroplate as a mode for artistic design thus lasted until the end of Victoria's reign. The comparison of Ashbee and Dresser as designers allows an in-depth look at the problems Victorians faced in their attempts to combine design and industry.

Conclusion

In light of the exhibition's illustration of Victorian views concerning electroplate, it is interesting to look back on the commentary made in Charles Christofle's obituary that electroplate rivalled the inventions of the railway, electric telegraph, and photography.²⁴⁵ Technical inventions were signs of the changing, developing world in which Victorians lived. As the arguments surrounding the aesthetics of electroplate have demonstrated, Victorians responded to change in vastly different and contradicting ways. Victorian electroplating may well serve as a symbol of the new, emerging Britain and the fading of the past. The aesthetic concerns surrounding electroplate, therefore, mirrored the sentiments of the Victorians who desired the old world, were excited to belong to a revolutionary time, and those who wanted to balance the two. All of these debates, therefore, were about the nature and identity of Victorian Britain.

□ *Tracing Electroplate After its Decline*

The controversies surrounding electroplating in the nineteenth century proceeded after its decline and are still relevant today. Firms continued to produce electroplate on a large scale until the introduction of chromium plate in the 1920s and stainless steel after World War II produced more durable goods.²⁴⁶ Ironically, these new businesses overtook electroplating as electroplating had superseded the Sheffield Plate industry. The stainless steel market, like the electroplating market, appeals to customers today because it is inexpensive, easy to care for, and looks similar to silver.²⁴⁷

Today, electroplate is used by designers who desire to reach customers fascinated by its technology and offer electroplate at a lower price than silver. Although most British artists today prefer to work silver by hand, a few companies offer electroplate at a more affordable price than silver.²⁴⁸ New ways have emerged to advertise electroplate, the most wide-reaching the Internet. Though Elkington's closed after the decline of the luxury market following World War II, Sheffield Flatware & Cutlery Products sells exact replicas of Elkington & Company electroplate cutlery via the Web.²⁴⁹

Electroplating technology also inspires companies to create new designs. The London firm BJS currently uses electroforming for creating innovative designs. The process has changed since the nineteenth century and a computer controls the amount of silver deposited onto the mould.²⁵⁰ Electroplating is used on a more commercial scale in Italy and the United States.²⁵¹ The objective of the Italian firm Alessi is similar to the ideals of Dresser and Cole. An Alessi electroplated tea service made in 1983 combines technology and modern aesthetics (comparative plate 41). The teaset is a comical nod to Dresser's teapot, for the bodies of Alessi's service are also composed of geometrical designs that allow easy manufacture. However, the designer has added wings to the bodies and has elongated the stands to make the

service resemble a nest of birds. The firm's beliefs look back to Pugin's ideas that items should be functional while also fulfilling spiritual needs. The wings, therefore, are symbolic of hope for the past and future, showing that electroplating designers today are also working out the arguments that began in the nineteenth century.²⁵²

Exhibition Catalogue

1

A PAIR OF ELECTROGILT ELECTROFORMED COPPER VASES

Unmarked, Designed by Alexander Parkes, Manufactured by Elkington & Company, c. 1845
4.4 in. (11.2 cm.) high

Provenance: Currently in Metalwork Gallery 67, V&A, on Loan from the Science Museum, London

Exhibited: A similar vase was exhibited at the 1851 Great Exhibition, London as illustrated in the Elkington's section in the Art-Journal Illustrated Catalogue of the 1851 Great Exhibition, London, 1851, p. 194 (see below).

The vases were designed and created by Alexander Parkes, chief metallurgist at Elkington's who perfected the electroforming process. As early examples of electroforming and electrogilding from the Elkington factory, the vases are representative of Parkes improvements upon established electroplating technology. Parkes was one of the inventors working for Elkington's whose inventions helped Elkington's maintain a stronghold on the electroplating industry.

The vase is decorated overall with raised acanthus leaf, grape and vine ornament, showing that Parkes based his design on naturalistic and Classical ornament that was popular during the period in which they were made. This allowed Elkington's to cater to consumer taste. The elaborate decoration is also a sign that Elkington's wanted to exploit their new technique and flaunt the possibilities capable by Parkes's invention. Elkington's showed examples of electroforming at the Great Exhibition, including a similar vase, to demonstrate their unique process.



Catalogue Plate 1:

A Pair of Electrogilt Electroformed Copper Vases

Designed by Alexander Parkes, Manufactured by Elkington & Company, Birmingham, c.1845



2

AN ELECTROPLATE AND SHEFFIELD PLATE CANDELABRUM

Mark of T.J. & N. Creswick, Sheffield, c. 1840

27.63 in. (70.2 cm.) high

Provenance: Received by the V&A at the bequest of the Estate of R.E. Jerome in 1984; Currently in V&A Metalwork Gallery 67, museum number M4 1994.

The candelabrum is of a highly ornate form in the Rococo Revival style. The base is lavishly decorated with applied organic designs of vine and grapes and scrollwork. Three pairs of curvilinear foliate branches support the nozzles, showing that the ornament is also an example of naturalistic design that was popular during the time it was made. The vogue for naturalistic ornament coincided with the invention of electroplating around 1840. The new process was better suited to plating elaborate ornament because it was plated objects after they were formed. The popularity of organic ornament contributed to the demise of the Sheffield plate industry because the concealing of the copper core in elaborate Sheffield plate objects required much time and labour.

T.J. & N. Creswick alleviated these problems by combining Sheffield plate and electroplating in this example. The candelabrum is largely made of stamped electroplated nickel silver although the nozzles and drip pans are of stamped Sheffield plate. However, this is an early example of electroplating and the silver coatings on both the Sheffield plate and electroplate sections wore away and exposed the core later in the nineteenth century. To conceal the core, the candelabrum was replated by electroplating later in the century as evidenced by the thick coating of silver. The bright, white colour of the silver was produced by the replating, for electroplating deposits pure silver onto the surface of an object. The candelabrum is also an example of the success of determined Sheffield plate firms like T.J. & N. Creswick, for the firm continued to make Sheffield Plate at their London retail store until the end of the century.

Catalogue Plate 2:
An Electroplate and Sheffield Plate Candelabrum
Manufactured by T.J.&N. Creswick, Sheffield, c.1840



A WOOD ENGRAVING

‘H.R.H.’ THE PRINCE OF WALES VISIT TO THE ELKINGTON & CO. FACTORY’

No artist given, Published in The Graphic, 7 November 1874 issue, p.449

33 mm. high, 24 mm. wide, bound

Provenance: Currently in the National Art Library, pressmark PP.8.D-E.

Literature: Henri Bouilhet, Christofle: Silversmiths Since 1830, Hachette/Chêne, 1981, p.27

The engraving depicts scenes from a visit by H.R.H. The Prince of Wales to the Elkington & Co. Factory at Newhall Street, Birmingham. Wood engraving was the most popular form of making the illustrations because new technology enabled fast mass-production. The process was invented in the late eighteenth century and was improved upon by the invention of electrotyping. Because wood blocks disintegrated with frequent use, electrotyping was used to create strong metal replica blocks.

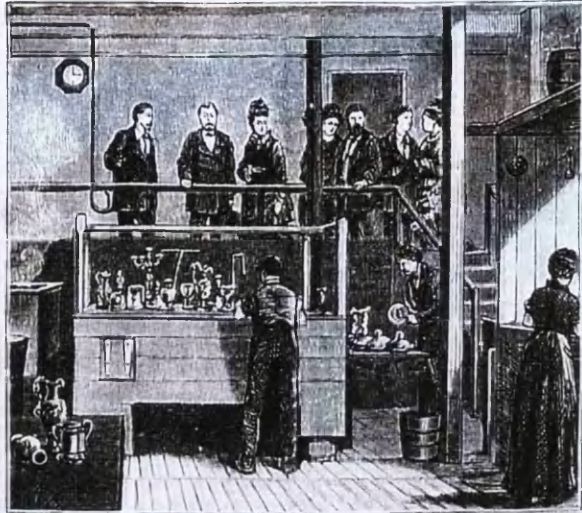
By the middle of the nineteenth century, newspapers like The Graphic were widely read by a wide range of social classes and the illustrations appealed to the literate and illiterate. Illustrations like this incited much interest in the scientific processes and the human craft of electroplating. Because illustrations like this educated a wide audience of readers in electroplating, they also advertised electroplated products. Illustrations like this supported consumer beliefs that electroplating was part of the magic of Victorian technology. The seven scenes of the Elkington factory also show that large companies provided well-ventilated and large workspaces for their employees unlike smaller companies. The portraits of workers using machinery like the stamping equipment also show the importance of new technology in industrial manufacture.

Catalogue Plate 3:
 A Wood Engraving of 'H.R.H. The Prince of Wales Visit to the Elkington Factory,'
The Graphic, 7 November 1874

SKETCHED AT THE WORKS OF MESSRS. ELKINGTON AND CO., VISITED BY H.R.H. THE PRINCE OF WALES



MODELLING



GOLD PLATING



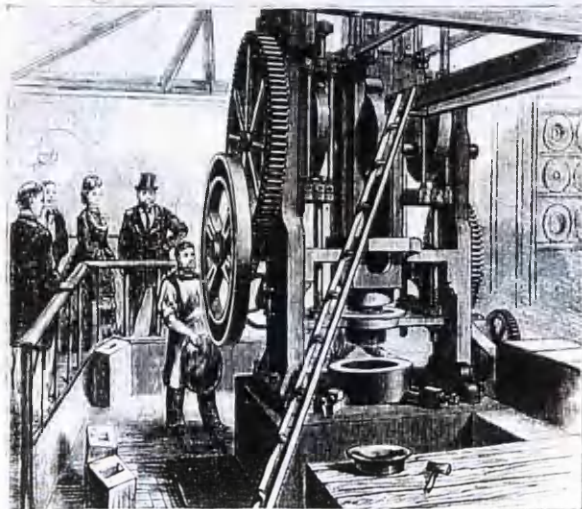
MILL STAMP



ENTRANCE TO THE WORKS



SOLDERING



STEAM PUMPING



ENAMELLING

AN ELECTROPLATED NICKEL SILVER ENTRÉE DISH COVER

Marked E&Co. for Elkington & Company, Birmingham, Date letter A for 1865,

11.81 in. (30 cm.) high

Provenance: Currently in the V&A Metalwork Gallery 67, on loan from the National Railway Museum, York.

The nickel-plated domed entrée dish cover with scroll handle was a common novelty item advertised in Elkington catalogues. However, hotels and railways could order items like this dish cover specifically for their businesses. This example, engraved with 'The Midland Hotel,' was made for the 1873 opening of the Midland Grand Hotel at London St. Pancras Station, designed by the architect George Gilbert Scott. The stylised floral borders were specially ordered by the Hotel and were produced by rolling the nickel silver core through a rolling machine with a wire pattern that transferred the design to the metal.

Dish covers added to the grandeur of dining in hotels and railways. With the expansion of the railway came the need for hotels. Hotels and railway cars aspired to the luxuries of the middle class homes and it was social etiquette to have a complete silver or electroplated table service. Entrée dish covers were necessary for keeping food warm and protecting food from insects. Electroplate was also a symbol of the developing world in which Victorians lived.



Catalogue Plate 4: An Electroplated Nickel Silver Entrée Dish Cover

Manufactured by Elkington and Company, Birmingham, 1865

AN ELECTROPLATED BRITANNIA METAL COFFEE POT

Marker's mark on base in shield, James Dixon and Sons, Sheffield, with the inventory number 66910, and the Registered Design mark for 29 January 1850, stamped ELECTROPLATED 10.35 in (26.3 cm.) high.

Provenance: Gift of Shirley Bury to the V&A in 1999, Currently in V&A Metalwork Gallery 67, museum number M23 1999.

Literature: The Journal of Art and Design in 1850 praised the 'well finished and smooth, bright surfaces' of the coffeepot; Shirley Bury, Victorian Electroplate, London, 1971, p.32-33.

James Dixon & Sons started primarily as Britannia metalsmiths but by the middle of the nineteenth century they produced silver, Sheffield plate, and electroplate. The coffee pot was assembled from sections of Britannia metal, which were stamped from patterned dies and soldered together before the pot was electroplated. Because Britannia metal is thin and easily dented, it was inexpensive and accessible to the middle class and the lower middle class.

The coffee pot exhibits similar characteristics as the Rococo Revival objects in the 1847 Elkington catalogue (comparative plate 19). The rosebud finial and the scrolled handle, spout, and stamped decoration on this coffeepot reflect the ornament admired by the upper class in the eighteenth century. The middle classes of the nineteenth century used ornament like this to aspire to the tastes of the upper classes. The coffee pot would have been set at a formal table setting that was part of the social etiquette of the Victorian Age. Electroplate contributed to the luxury of a table setting as praised by Mrs. Beeton in The Book of Household Management. Table displays included electroplate items like this coffeepot to display a family's wealth.

Catalogue Plate 5:
 An Electroplated Britannia Metal Coffee Pot
Manufactured by James Dixon and Sons, Sheffield, 1850



A SET OF THREE SILVER DECANTER STOPPERS

Maker's Mark of Smith and Nicholson, London, 1856, Duty Mark, lion passant

4.4 in. (11.3 cm.) high

Provenance: The V&A bought the stoppers from Smith and Nicholson in 1864.

Exhibited: 'English Silver from the 16th to the 20th Century,' Moscow/Leningrad, 1978, Belgrade 1980.

Literature: Shirley Bury, 'Felix Summerly,' Apollo Magazine, IXXXV, 1967, p.29; Shirley Bury, 'Victorian Electroplate,' London, 1971, p.47.

The stoppers were originally designed by John Colcott Horsley for the Summerly Art Manufactures in 1847 and made by Benjamin Smith, Junior. Electroplate stoppers of this design were published in a Summerly Art Manufactures catalogue. Summerly Art Manufactures was a small business conceived and operated by Henry Cole who used the pseudonym, 'Felix Summerly.'

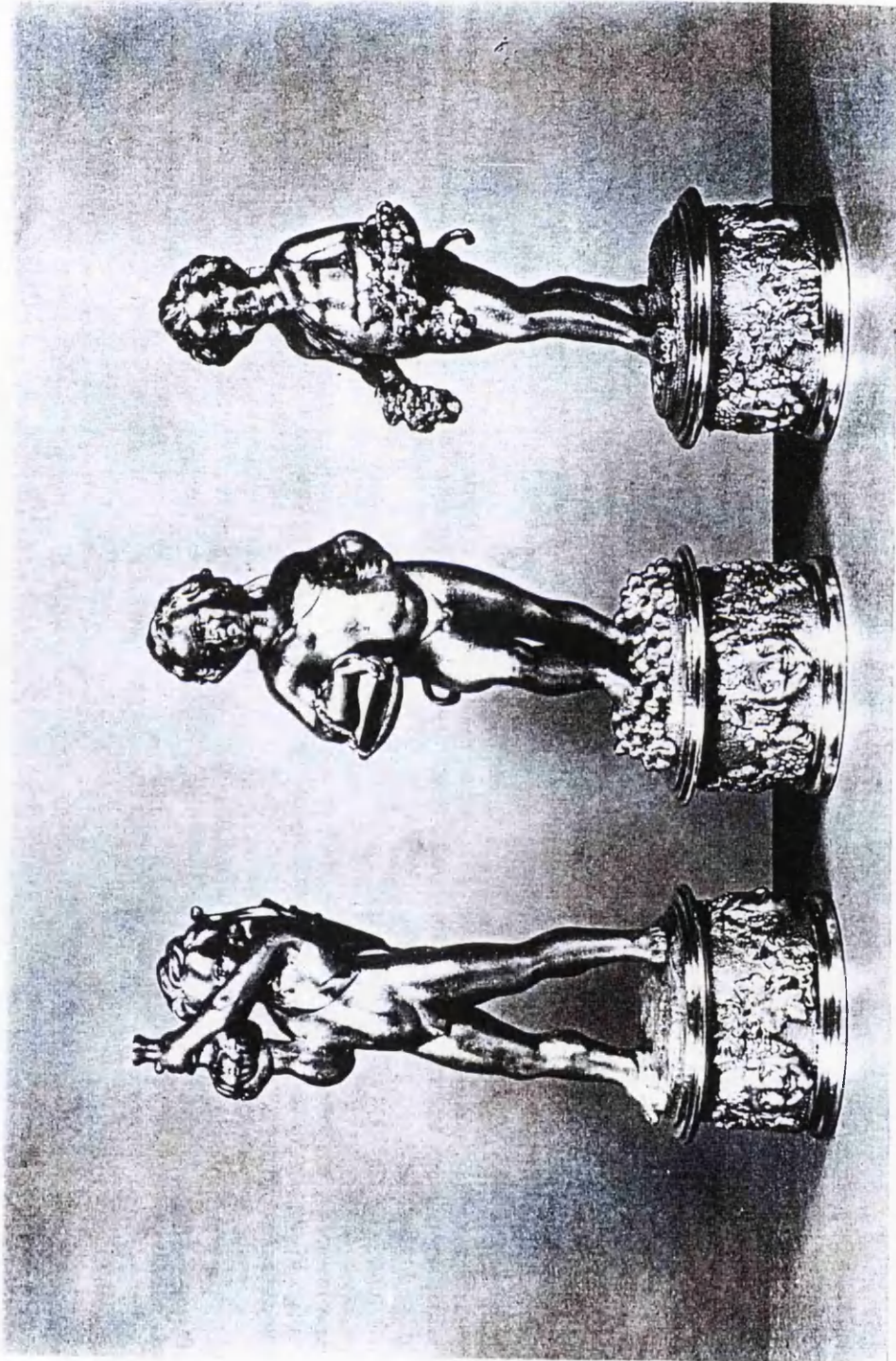
Designs were commissioned by Cole in his attempts to improve industrial design. Although Cole recommended new design concepts, his designers tended to follow popular styles of the day. These stoppers are representative of the trend towards appropriate decoration for utilitarian articles. The decanter stoppers thus illustrate three stages of wine making; harvesting, treading and decanting. The putti with grapes are also an example of Classically derived ornament praised by Cole because of its restrained ornament. Summerly Art Manufactures sold products like the decanters because Cole felt that the well-designed articles would influence consumer taste and inspire industries to consider good design in the manufacture of mass-produced goods.

Catalogue 6:

A Set of Three Decanter Silver Decanter Stoppers

Manufactured by Smith and Nicholson, London, 1856

Photo Credit: Shirley Bury, 'Felix Summerly,' Apollo Magazine, IXXXV, 1967, p.29.



A SILVER PARCEL-GILT CHALICE

Designed by A.W.N. Pugin, mark of John Hardman & Company, Birmingham, 1850, lion passant, duty mark

9 in. (22 cm.) high

Provenance: Bought by the Museum of Manufactures (a predecessor of the South Kensington Museum) from The Great Exhibition; Currently displayed in the V&A Metalwork Gallery 67, museum number 1328-1851.

Exhibited: The Medieval Court, The Great Exhibition, 1851; 'English Silver from 16th-20th Century,' 1977-1978, Moscow; The Mall Galleries, 'Let's Keep A Diary,' September-October 1987; 'Pugin: A Gothic Passion,' V&A, June-September 1994.

Literature: Geoffrey Opie, Let's Keep a Diary, London, 1987, p.22.

The design for the chalice reflects Pugin's interest in Gothic art and opposition to the design of mass-produced goods. Pugin was not opposed to industrial techniques and the chalice's hexafoil base was stamped and Pugin used electroplate for his personal items and for interested customers. However, the mercury-gilded bowl of the chalice was raised by hand, the knop was set with garnets and amethysts, and the base was enriched with rosettes of champlevé enamel like Medieval silverwork.

These highly ornamental decorations were applied with traditional craftsmanship, reflecting Pugin's beliefs that hand-made art should enrich the soul of the producer. The chalice, used in Catholic services to serve wine at Communion, is also a form of religious devotion. Pugin felt that hand-made religious objects like the chalice should inspire worshippers with the artistic devotion of the maker. These ideas surrounding the chalice were in contrast to the progressive technology used to make objects for the Great Exhibition. Pugin disliked the displays of electroplate which used Gothic ornament for domestic items at the Exhibition because he felt that they were not true to Medieval examples.

Catalogue Plate 7:

A Silver Parcel-Gilt Chalice

Designed by A.W.N. Pugin, Manufactured by John Hardman and Company, Birmingham, 1850.



AN ELECTROPLATED PARCEL-GILT CAKE DISH

Made by William Gough & Company, Birmingham, c. 1850

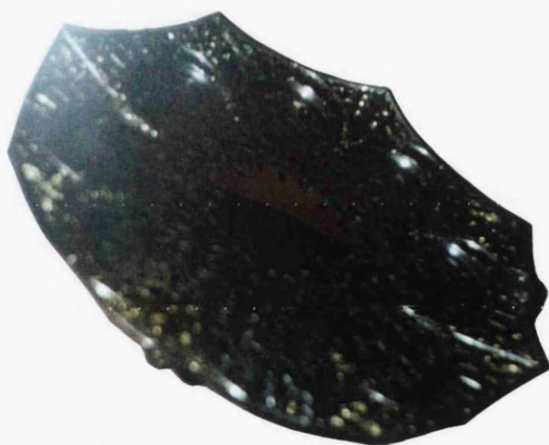
12.5 in. (31.75 cm.) diameter

Provenance: Bought by the Museum of Manufactures from The Great Exhibition, 1851; Currently displayed in V&A Metalwork Gallery 67; museum number 1333-1851.

Exhibited: The Great Exhibition, 1851.

Literature: Patricia Wardle, Victorian Silver and Silver Plate, London, plate 21; Shirley Bury, Victorian Electroplate, London, 1971, p.35.

William Gough & Company was commended in the Birmingham Exhibition of 1849 for their showing of pierced work because it improved upon the methods of piercing used by Sheffield plate manufactures. Electroplating examples, however, were not highly praised by the Jury of the Great Exhibition. This cake dish, probably designed by George Wilkinson, represents the new technology overlooked by the Jury. The critics of electroplate, including Pugin, may have overlooked electroplate because they were more willing to praise handiwork as art. The design of the plate also reflects Pugin's dislike of mass-produced design. Although the dish displays cornhusks relevant to the function and uses Gothic arches and strapwork in the decoration, it does not follow Pugin's principle of design.



Catalogue Plate 8: An Electroplated Parcel-Gilt Cake Dish

Manufactured by William Gough & Company, Birmingham, c.1850

ONE OF A PAIR OF ELECTROTYPED LEOPARD FLAGONS

Manufactured by Elkington & Company, 1880

27.5 in. (70 cm.) high

Provenance: Copied by Elkington's for the South Kensington Museum in 1880; Currently in V&A Metalwork Gallery 65.

The Flagon is an example of how electrotypes were used as teaching tools in the South Kensington Museum. The Leopard was copied from an English silver-gilt original made for Charles I in 1600-01. Because the original was bought by the Tsar of Russia in 1627, the Museum wanted a copy so that students could study historical English design. The Leopard was a result of a Convention organized by Henry Cole at which European countries, including Russia, agreed to exchange works of art. Although the trip to Russia was met with difficulty, the electrotype served as an exemplary model of casting and craftsmanship for art students. In keeping with Cole's ideals of education, electrotypes like the flagon travelled to cities at the centre of manufacturing so that designers could refer to them in creating modern design.

Catalogue Plate 9:

One of a Pair of Electrotyped Lion Flavons

Manufactured by Elkington & Company, Birmingham, 1880



AN ELECTROTYPE OF THE MILTON SHIELD

Designed by Leonard Morel-Ladeuil, Manufactured by Elkington & Company, Birmingham, 1867

34.5 in. (87.6 cm.) high

Provenance: The South Kensington Museum bought this electrotype from Elkington's in 1868 after seeing Elkington's display of the original Shield at the Paris Universal Exhibition in 1867. The electrotype is currently in storage in the V&A Metalwork Department, museum number 79.3 Type.

Literature: Stephen J. Helliwell, Understanding Antique Silver Plate, Aberdeen, 1997, p.143; Shirley Bury, Victorian Electroplate, London, 1971, p.45.

The original Milton Shield, which illustrates episodes from John Milton's Paradise Lost, was shown by Elkington & Company at the Paris Universal Exhibition, 1867 and was purchased for the South Kensington Museum the following year. It was designed by Morel-Ladeuil, a French craftsman who had come to England to work for Elkington's in 1859. Because of the success of French design at the Great Exhibition, Elkington's used Morel-Ladeuil's talent to add to the firm's prestige. This Shield is a prime example of his intricately chased and worked large exhibition pieces on which the artist worked for months or years.

The South Kensington Museum used electrotypes of The Milton Shield to show examples of good modern design. Like most popular designs of the Victorian Age, the Shield is based on historical themes. For example, the central panel displays Canto V of Paradise Lost in which the Archangel Raphael tells Adam and Eve of the war in Heaven. The theme was chosen to celebrate the work of a great English poet and also displays the artist's mastery of creating a modern composition. The South Kensington Museum authorised Elkington's to produce copies for sale to public consumers and art colleges. Unlike most items reproduced by Elkington's, this electrotype does not have the stamp of the Science and Art Department.

Catalogue Plate 10:

An Electrotype of the Milton Shield

Designed by Leonard Morel-Ladeuil, Manufactured by Elkington & Co., Birmingham, 1867



AN ELECTROFORMED COPPER-GILT CHAMPLEVÉ ENAMEL VASE

Elkington and Co. stamped on the base, Birmingham, 1876

15.7 in. (39.5 cm.) high

Provenance: Purchased by the South Kensington Museum from the Centennial Exhibition, Philadelphia, 1876; Currently in V&A Metalwork Gallery 67, museum number 562 1877.

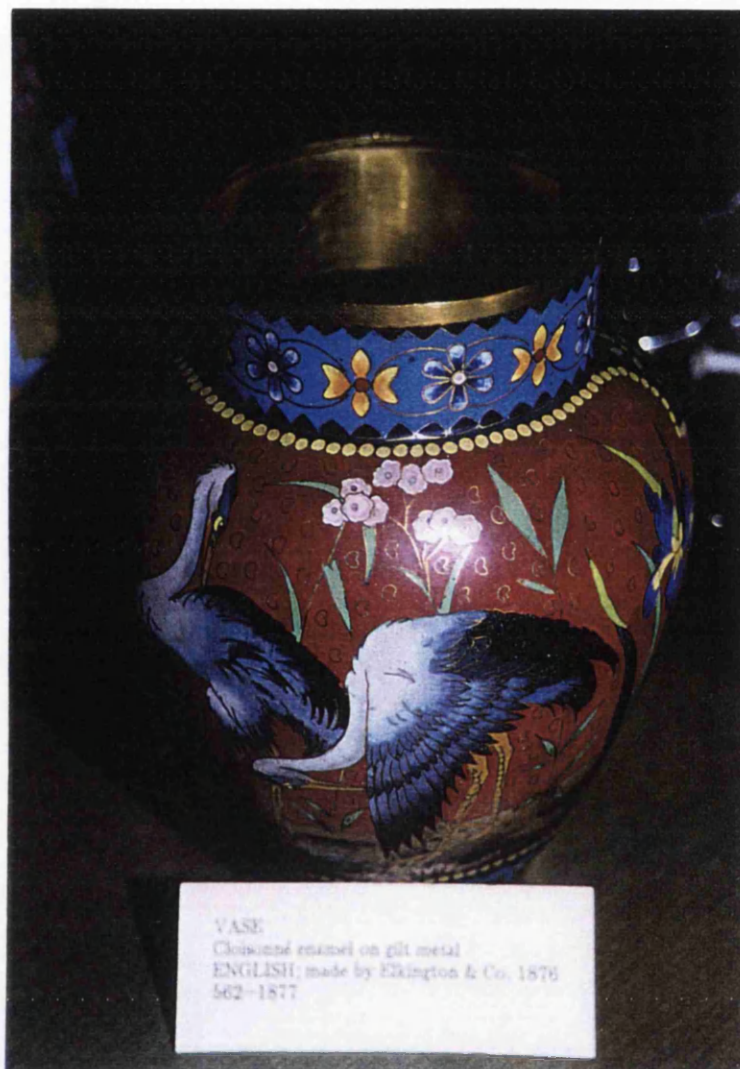
Exhibited: Centennial Exhibition, Philadelphia, 1876; 'Japonisme,' Grand Palais, Paris, and Tokoyo, 1988.

Literature: Japonisme, Paris, 1988, plate 125.

The baluster shaped vase is decorated with storks and stylised flowers in the style of Japanese cloisonné enamel objects like a Japanese export coloured enamel vase made in 1881 (comparative plate 35). It represents Elkington's concern for reaching the mass market by capitalizing on the vogue for Japanese designs during the Aesthetic Movement.

In efforts to produce cheaper versions of cloisonné enamel that did not have to be imported from the Far East, Elkington's showed ingenuity by creating a process that reduced the amount of labour involved in the process. Japanese enamellers used traditional wire techniques with the enamel poured into cloisons or compartments formed by a network of metal bands on the surface of the object. The tops of the bands remain exposed, dividing one area of colour from another. Elkington's attempted to replicate this effect by using a champlevé enamel technique. The vase was electroformed complete with cavities for the enamels. Ironically, Elkingtons only produced these vases for about ten years (1870-1880) because they found it cheaper to import the traditional Japanese examples.

Catalogue Plate 11:
An Electroformed Copper-Gilt Champlévé Enamel Vase
Manufactured by Elkington & Co., Birmingham, 1876



AN ELECTROPLATED NICKEL SILVER TEAPOT

Designed by Christopher Dresser (stamped signature on base), Manufacturer mark of James Dixon and Sons, marked EP for electroplated, production number 2273, and registry mark showing that the design was registered 25 April, 1880.

4.5 in (11 cm.) high

Provenance: Bought by the V&A in 1961 from Mrs. White; Currently in V&A Metalwork Gallery 67, museum number Circ 279-1961.

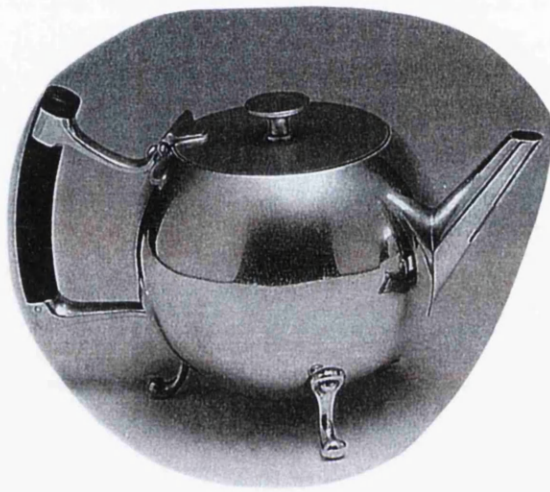
This teapot displays the innovative design ideals of Christopher Dresser. Like Henry Cole, Dresser believed that the quality of English design was declining in the nineteenth century. Dresser's design for this teapot is unique in comparison to historically based designs made by other manufactures of this period.

The emphasis of the teapot's design is on geometry in the circles of the lid and the sphere of the body. This reflects Dresser's interest in creating simple, functional shapes that were easy to manufacture and were ergonomic. Dresser also studied botany and he used science in the geometric design of teapot and the tilted handle, which was tested to allow the teapot to pour easily. The teapot was also designed for industry, for the small scroll feet could be easily screwed onto the body and the round body was formed by spinning. The ebony-like handle, made of painted wood, shows that Dresser's design for the teapot was also influenced by Japanese aesthetics. The use of simple geometry in the teapot reflects Dresser's concern that designs should be simple and should be original in order to compete on an international level. Dresser appreciated electroplating and used it in domestic pieces like this teapot because it conserved the amount of precious metal deposited and made it more affordable for the middle class to own his works.

Catalogue Plate 12:

An Electroplated Nickel Silver Teapot

Designed by Christopher Dresser, Manufactured by James Dixon & Sons, Sheffield, 1880



13

AN ELECTROPLATED COPPER MUFFIN DISH AND COVER

No marks, Designed by Charles Robert Ashbee, Manufactured by the Guild of Handicraft, London, c.1898

4.5 in. (11 cm.) high

Provenance: Gift of Stuart Durant Esq. to the V&A in 1967; Currently in storage in the V&A Metalwork Department, museum number Circ 1043 & a-1967.

Literature: Shirley Bury, Victorian Electroplate, London, 1971, p. 58, 60.

Ashbee's Guild of Handicraft made electrotypes of stock items like this muffineer in order to make them more affordable for customers. Ashbee's Guild was unique in a period when the silver trade was dominated by mass-produced traditional designs. Ashbee founded the Guild based on the ideals of the Arts and Crafts Movement and the muffineer reflects his ideas that a worker should create an object from beginning to finish. The use of electroplating on this object shows that Ashbee was not against technology. Ashbee was inspired by the advances of technology used in factories like Gorhams in the United States. However, he opposed the division of labour used in large factories and the muffineer shows Ashbee's belief in traditional craftsmanship. This example shows planishing marks on the bell-shaped cover and the shallow circular shallow dish, evidence that a member of the Guild worked the object by hand.

Although Ashbee was concerned with traditional craftsmanship, he wanted to create modern designs. The chrysophase set in the wirework handle of the muffineer was inspired by the use of semi-precious stones in Medieval work. Ashbee was also influenced by Pugin's design concepts. However, the organic, whiplash curves of the wirework show that Ashbee was influenced by contemporary Art Nouveau design.

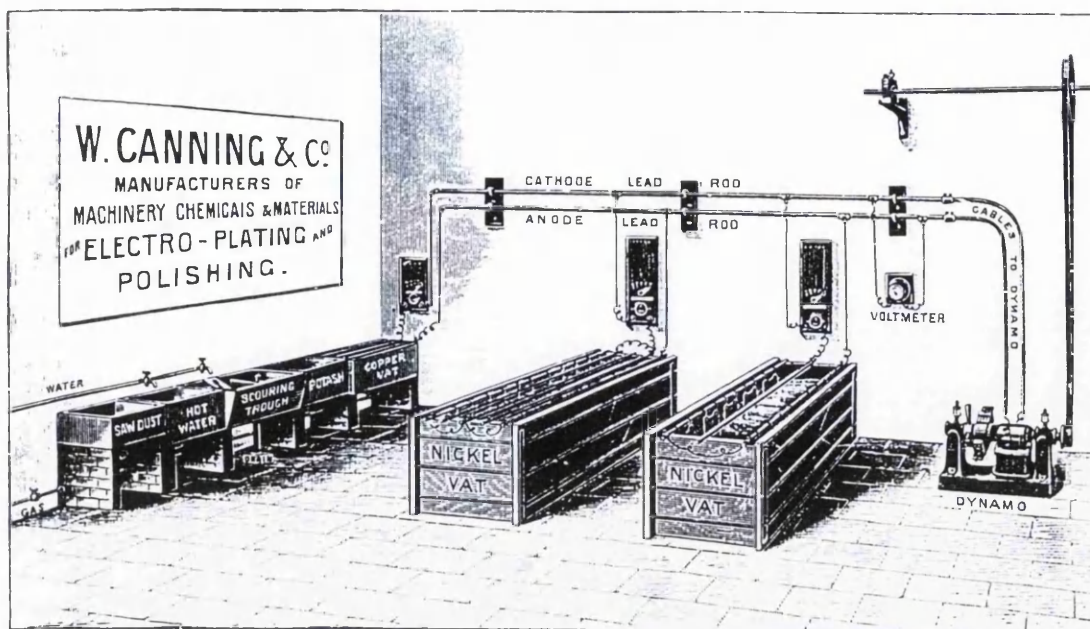
Catalogue Plate 13:

An Electroplated Copper Muffin Dish Cover

Designed by C.R. Ashbee, Manufactured by the Guild of Handicraft, London, c.1898



Comparative Illustrations



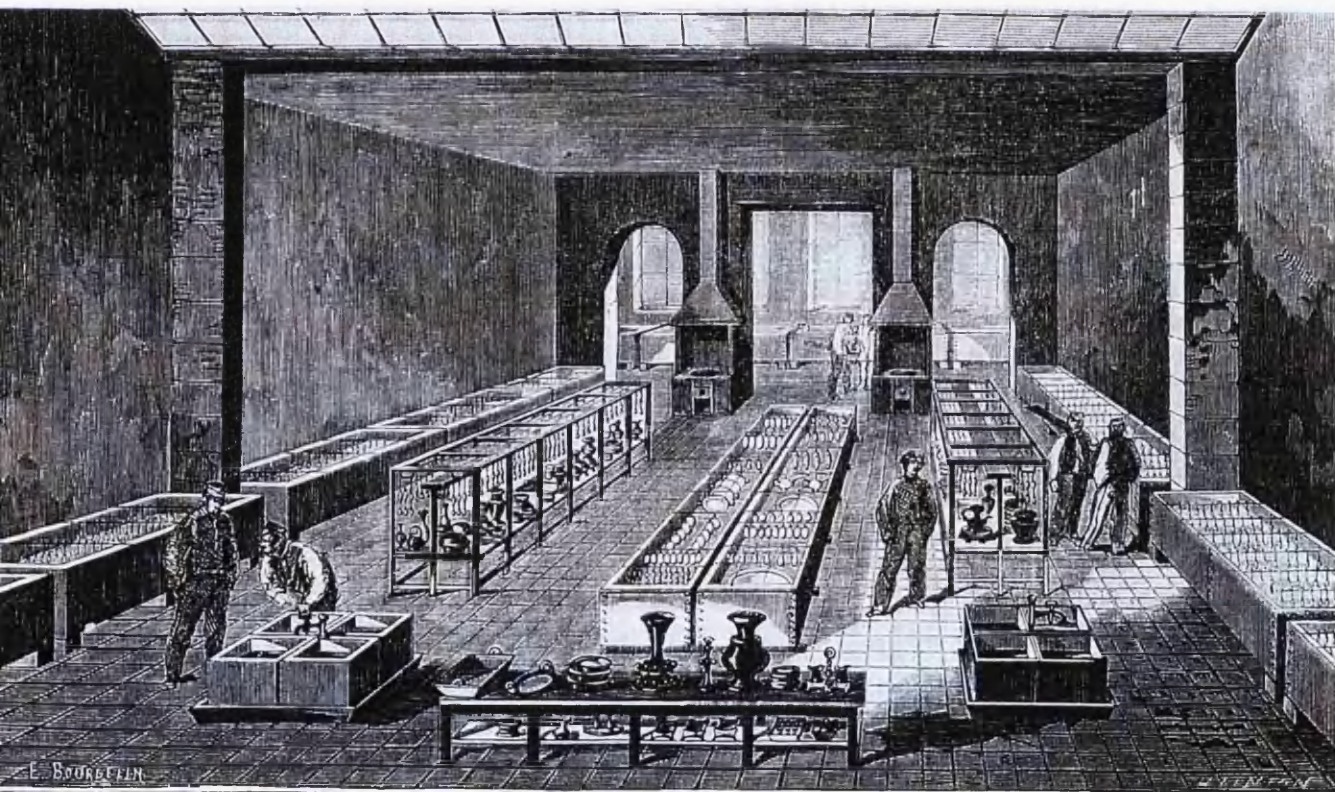
1. Representation of a plating shop (from Canning's 1922 Handbook).



2. Portrait of George Richards Elkington.



3. *The Mérode Cup, silver-gilt, probably Flemish, c.1400, Victoria & Albert Museum.*



4. *E. Boudelin, engraving of the first Christofle silver plating shop on the Rue de Bondy, French, c.1845.*



5. Detail of 'letting in,' soldered lines in a Sheffield plate teapot stand, English, c.1790, Victoria & Albert Museum.



6. Sheffield plate Cake Basket, English, c.1780-90, Victoria & Albert Museum.



7. *A pair of Sheffield plate candlesticks, manufactured by Matthew Boulton's factory, Birmingham, c.1770-80, Victoria & Albert Museum.*



8. A candlestick electroplated in oxidised silver and gold, manufactured by Elkington's, Birmingham, c.1847, Victoria & Albert Museum.



9. Wood engraving of 'A General View of Sheffield from the East, Taken from St. James's Church,' *The Graphic*, 28 November 1874.



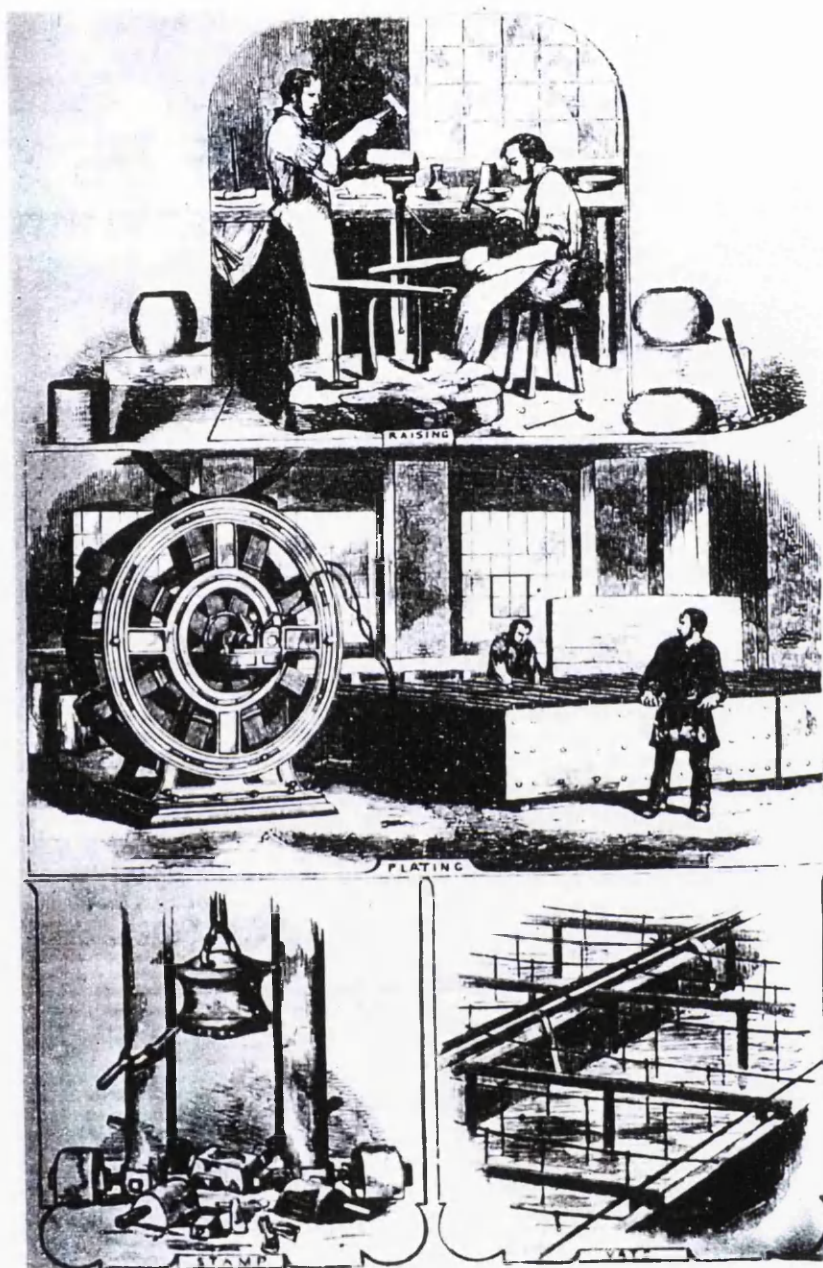
10. Wood engraving of 'Buffing Electroplate at Messrs. Martin, Hall, and Co.'s Works,' The Graphic, 28 November 1874



11. George Cruikshank, *The British Bee Hive*, Etching, 1840, Victoria & Albert Museum.



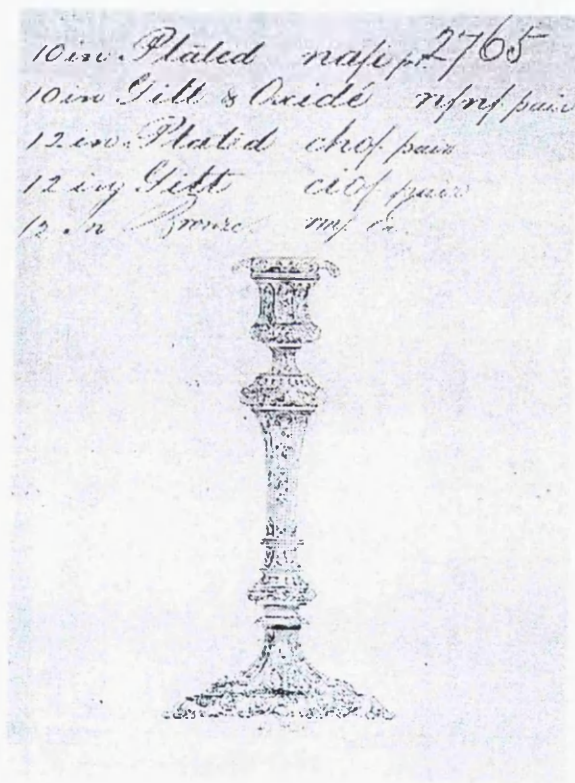
12. Ford Madox Brown, *Work*, oil on canvas, 1852-65, Manchester Art Gallery.



13. Wood engraving of Elkington's electroplating works, *Cassell's Illustrated Exhibitor*, 1852.



14. Wood engraving of the first regular dining-car service on the The Prince of Wales Pulman, Illustrated London News, 1879.



15. Design for a candlestick offering a variety of finishes, Elkington Pattern Book, 1847.



16. An advertisement in *The Queen*, 'Show Rooms-112 Regent Street, London,' the interior of the Goldsmiths and Silversmiths Co., 29 November 1884.



17. The exterior of Mappin Brothers shop, Regent Street, *Illustrated Times*, 31 May 1862.



18. A photograph of a family at tea with a silver or electroplate tea set on the table, unknown photographer, English, c.1871, Private collection.



19. Elkington's catalogue featuring Rococo Revival designs, Birmingham, 1847.



20. A table setting for tea from Mrs. Beeton's Book of Household Management, 1859.



21. An illustration of the Veneerings at dinner, Marcus Stone, 1865. From Charles Dickens, *Our Mutual Friend*, 1865.



22. *Conversazione at the Ironmonger's Hall*, *Illustrated London News*, 1861.

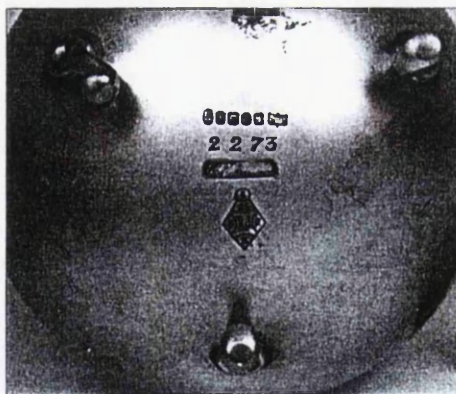
1856



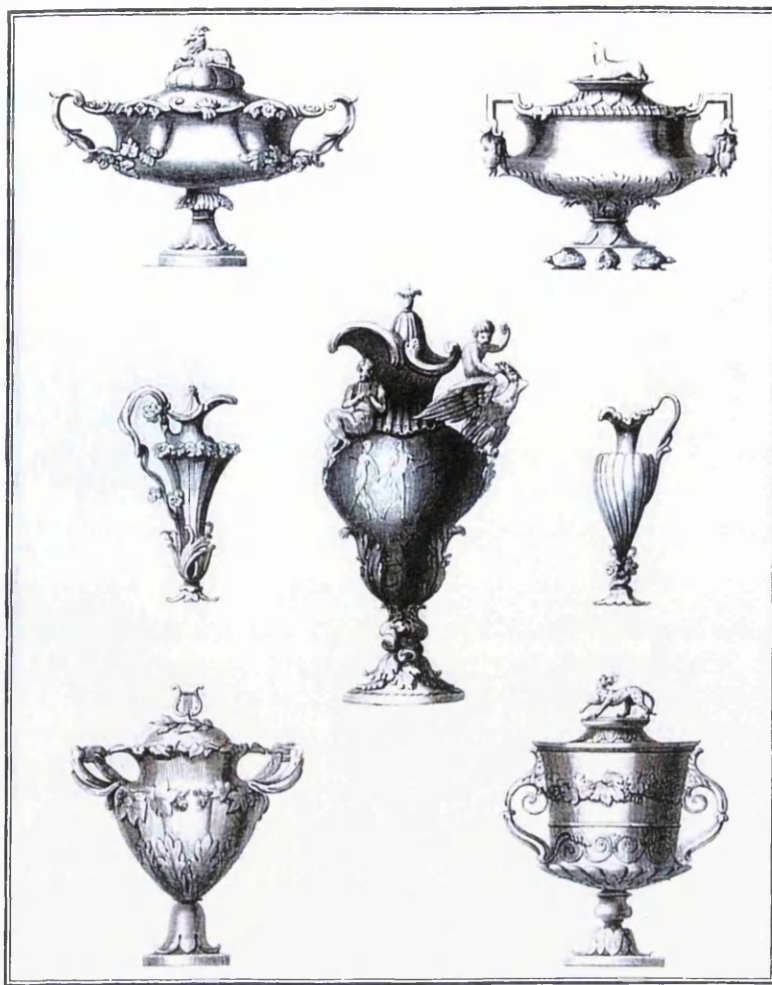
23. Silver marking for the year 1856.



24. A detail showing the marks of an electroplated Britannia metal sugar bucket, manufactured by James Dixon & Sons, Sheffield, early twentieth century.



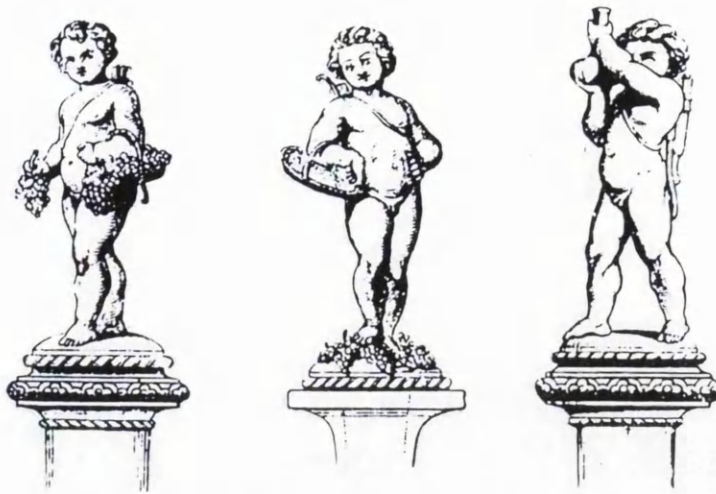
25. A detail showing the marks of an electroplated teapot designed by Christopher Dresser, manufactured by James Dixon & Sons, Sheffield, the diamond registry mark for 1880.



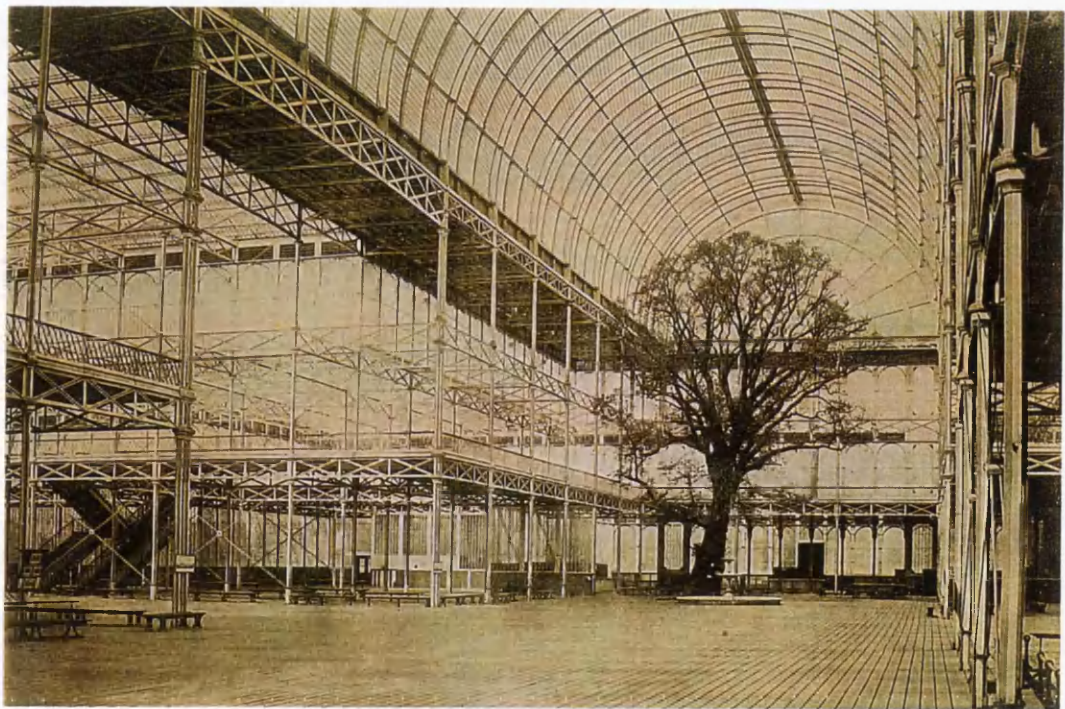
26. A page from *Knight's Vases and Ornaments*, 1833.



27. 'Anthia,' pattern for a teapot, electroplate, designed by John Bell for Summerly's Art Manufactures, 1849, *Journal of Design*, 1849.



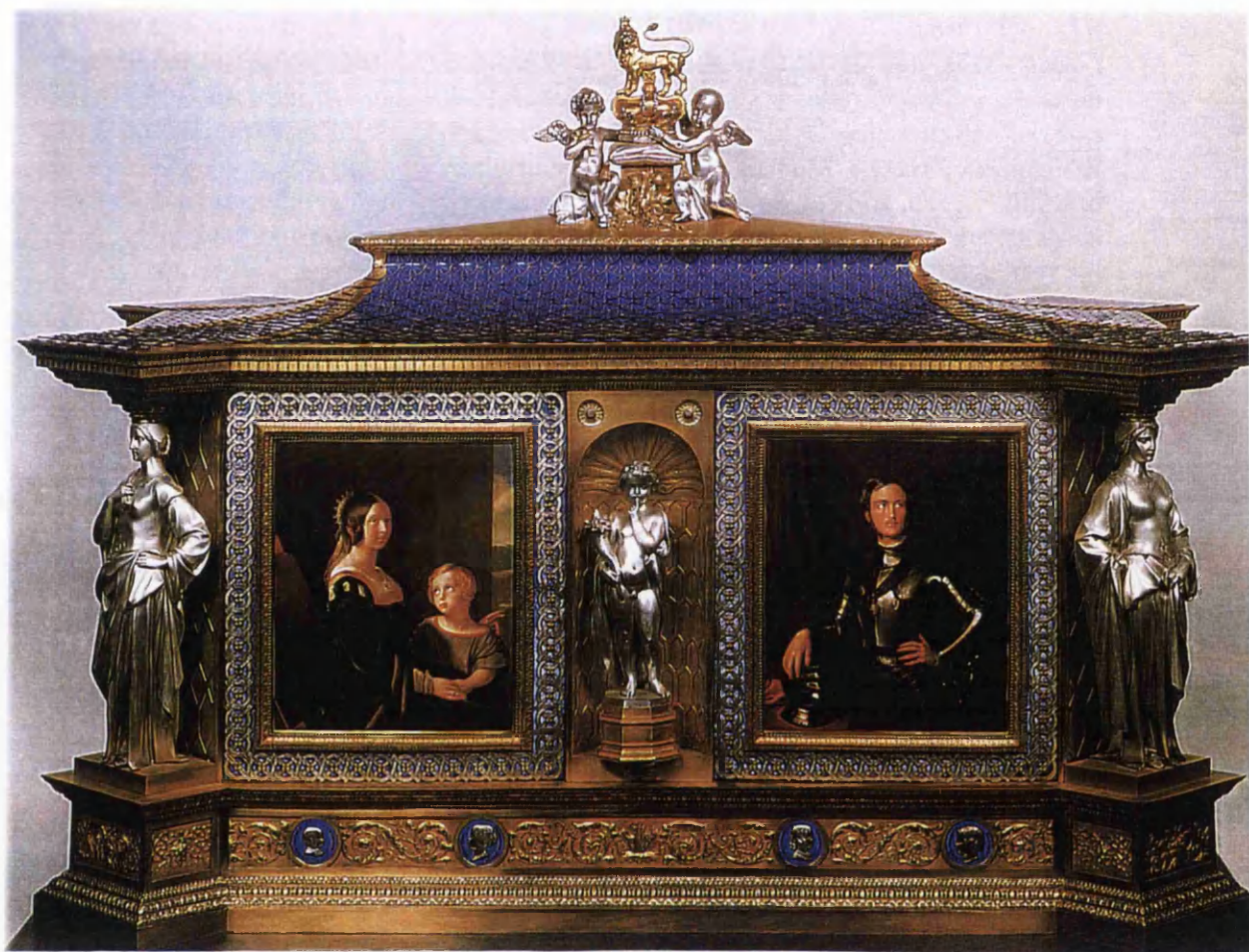
28. Woodcut design of a set of decanter stoppers designed by J.C. Horsley for Summerly's Art Manufactures, 1847.



29. Crystal Palace, Hyde Park, Transept, Albumen print from calotype negative, Benjamin Brecknell Turner, 1851, Victoria & Albert Museum.



30. Pugin's Medieval Court, Views of the Great Exhibition, 1851.



31. *Jewel Cabinet, electroplated, with electrotyped statuettes, parcel-gilt and enameled, designed by Louise Gruner for Elkington & Company, 1851, The Royal Collection.*



32. Detail of *The Doors of Paradise*, designed by Lorenzo Ghiberti, electrotype by Franchi and Son, 1867, V&A Cast Courts.



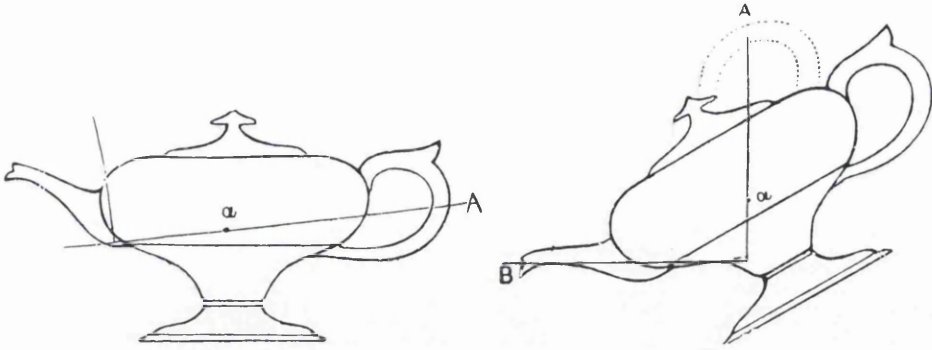
33. Detail of the electroformed statues on the Hereford Screen, iron, mosaic, electroform, electroplate, designed by Sir Gilbert Scott, 1862.



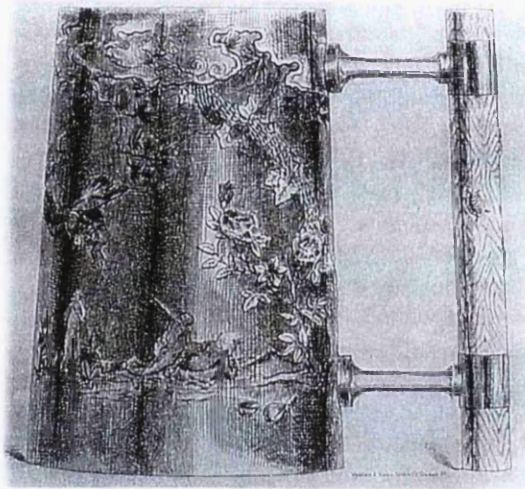
34. *The Peacock Room*, designed by James Abbott McNeill Whistler, 1876-77, Freer Gallery of Art, Washington, D.C.



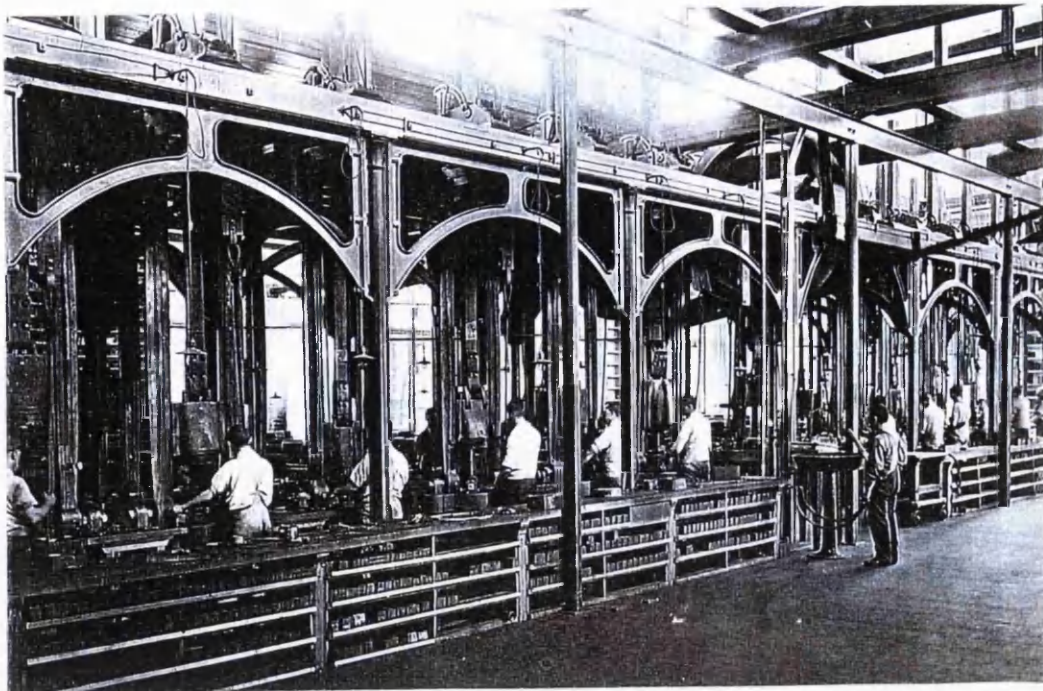
35. *Japanese Export cloisonné enamel vase*, c.1880-1, Victoria and Albert Museum.



36. Design for a teapot, by Christopher Dresser, *Principles of Victorian Decorative Design*.



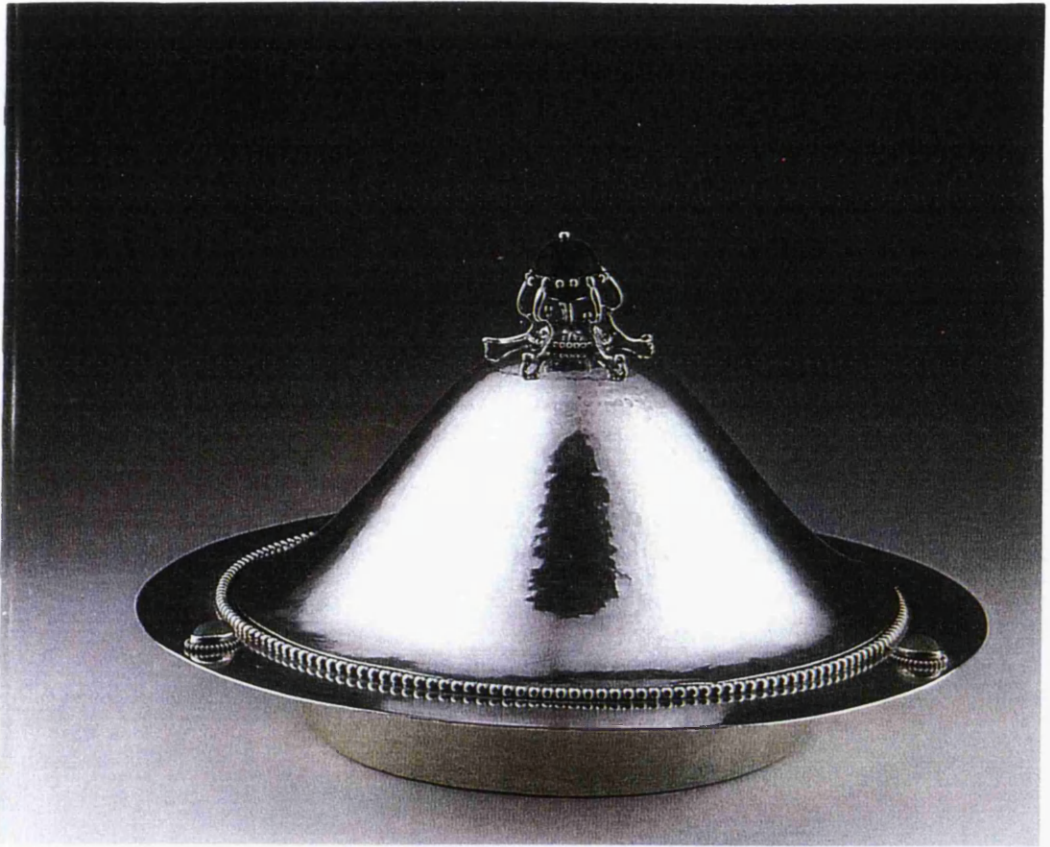
37. Japanese metalwork imported by Christopher Dresser, *The Furniture Gazette*, 22 May 1880.



38. Drop presses in Gorham Mfg. Co. preparatory room, Elmwood manufactory, Providence, Rhode Island, U.S.A., photograph, c.1890.



39. The metalworkers of the Guild of Handicraft, London, photograph, c.1901.



40. Silver muffin dish, the rim of the base set with chrysophases and the finial with a dark green stone, designed by C.R. Ashbee, 1900, Victoria and Albert Museum.



41. Electroplated silver on copper tea and coffee service, designed by Alessandro Mendini for Officina Alessi, Milan, 1983.

Appendices

□ *Glossary*

AESTHETIC MOVEMENT	A late nineteenth century movement in which artists appreciated form and colour above social meaning in art.
ART NOUVEAU	A style that emerged in the 1880s and reached its height of popularity in 1900. It is characterized by organic curves and asymmetry.
ARTS AND CRAFTS MOVEMENT	A reform movement in the second half of the nineteenth-century that wanted to revive the handicrafts and decorative design in response to Industrialization in Victorian England.
‘BLEEDING’	A term used to describe the revealing of an underlayer of copper or nickel in Sheffield Plate or electroplate.
BRITANNIA METAL	An inexpensive, thin, soft metal that is a variety of pewter composed of tin, antimony and copper.
CASTING	The process of shaping metal by pouring molten metal into a mould and allowing it to cool so that it takes the shape of the mould.
CHASING	A technique that enables silver to be decorated without removing any metal. The design is pricked onto the surface of an object. The object is then placed on a bed of pitch that provides a firm working surface while a chasing hammer pushes the silver into relief.
CHAMPLEVÉ ENAMEL	The process of pouring enamels into grooves which have been engraved on the surface of silver.
CLOISONNÉ ENAMEL	The process of pouring enamel into compartments formed by a network of metal bands on the surface of silver. The tops of the bands are exposed and divide one area of colour from another.
DIE-STAMP	A machine that dropped a steel mould die onto metal plate to create an impression of the die by the force of the drop.

DYNAMO	A machine that served electricity into the plating vats in the electroplating process.
ELECTROFORMING	The deposition of metal, usually copper, into a plaster mould by the electroplating process.
ELECTROGILDING	The process of depositing layers of gold onto a metal surface by the process of electroplating.
ELECTROPLATING	The deposition by electricity of a layer of metal, usually silver or gold, onto a base metal, usually copper or nickel silver.
ELECTROTYPING	Copying of an original piece of metalwork by taking a rubber mould of the original and then depositing metal onto the rubber surface by the electroplating process.
ENAMEL	Enamel is created by heating up the materials from which glass is made: flint or sand and potash or soda. Adding metallic oxides produces colour. The mixture is ground into powder, placed on the metal surface and fired to make it adhere to the silver.
ENGRAVING	Creating a design on metal by removing metal. A design is cut into the surface by a sharp, steel cutting tool called a burin.
FLY-PUNCH	A machine that works like a printing press to pierce silver or plate when a crossbar was turned to put force onto a cutting tool with the desired design.
GOTHIC REVIVAL	In Victorian England, a style that was inspired by designs from the Medieval period in which ornament took the form of ogee arches as exemplified in churches.
JAPONISME	Style popular from the 1860s in which designers derived and imitated form and ornament from Japanese works of art.

'LETTING IN'	A process in which a section of metal is cut out from a piece of Sheffield plate. A section of engraved silver that is cut to the shape of the hole is then soldered into the hole. The process prevents the copper 'bleeding' that would occur if Sheffield Plate was engraved.
MERCURY GILDING	A process of applying gilt to metals. An amalgam of gold and mercury is applied to the object and is then fired in a low temperature oven that drives off the mercury. The process is repeated so that enough layers of gold adhere to the silver surface.
NEOCLASSICISM	A style that was well established in England in the 1770s that took inspiration from Ancient Greek and Roman art. Neo-Classical ornament is simple, geometrical, and restrained.
NICKEL SILVER	An alloy of copper, zinc, and nickel that has a slightly greyer colour than silver.
OXIDISED SILVER	Coating of the surface of a metal object with a sulphur compound to colour the silver shades of grey. This process capitalized on the varying tones produced when applying electricity to produce silver.
PLANISHING	The flattening and smoothing of a piece of silver by lightly hammering with a smooth-faced hammer.
RAISING	Technique that produces a shape from a flat disc of silver. The disc is held over a rounded metal shape or anvil and worked with a hammer.
ROCOCO	Style that originated in eighteenth century France that was based on organic curves and frivolity. Much of the ornament alludes to nature, grottos and the swirling movements of water. The style was revived in the nineteenth century.
SHEFFIELD PLATE	Plate that looks like solid silver because it is formed by plating silver onto a copper core. The plate is then worked on as if silver.
SOLDERING	Fusing parts of a metal object together by heating the seams, adding hot metal, and allowing it to cool.

SPINNING

Process that originated in the 1820s that involves shaping a hollow ware object by turning it on a lathe.

WOOD ENGRAVING

Process that originated in the 1770s in which engravers cut pictures into the surface of a boxwood block with a sharp steel tool called a burin. It allowed a range of tones to be reproduced cheaply in newspapers.

□ **Endnotes**

INTRODUCTION

STRUCTURE OF THE EXHIBITION

¹ Jeffery A. Auerbach, The Great Exhibition of 1851, London, 1999, p.199.

UNDERSTANDING ELECTROPLATING

² Robert Child, 'Modern Electroplating and Electrofinishing Techniques,' from Metal Plating and Patination, edited by Susan La Niece and Paul Craddock, London, 1993, p.291.

³ Philippa Glanville, ed., Silver, London, 1999, p.60.

⁴ Mark Jones, ed., Fake? The Art of Deception, London, 1990, p.255. Evidence of plating to make a profit is found in antiquity when the most common method of silver plating was to solder silver foil onto another metal.

⁵ John M. Mackenzie, ed., The Victorian Vision, London, 2001, p.147.

⁶ Christopher Raub, 'The History of Electroplating,' from Metal Plating and Patination, edited by La Niece and Craddock, op.cit., p.285-6.

⁷ Shirley Bury, Victorian Electroplate, London, 1971, p.6.

⁸ Shirley Bury, Victorian Electroplate, op.cit., p.6.

⁹ Shirley Bury, Victorian Electroplate, op.cit., p.7.

¹⁰ Shirley Bury, Victorian Electroplate, op.cit., p.7.

¹¹ Hugh Honour, Goldsmiths & Silversmiths, London, 1971, p.253.

¹² Henri Bouilhet, Christofle: Silversmith Since 1830, Hachette/Chêne, 1981, p.89.

CHAPTER 1-INDUSTRY: THE SHOCK OF NEW TECHNOLOGY

THE FORMING OF AN INDUSTRY

¹³ Shirley Bury, Victorian Electroplate, op.cit., p.3.

¹⁴ Patricia Wardle, Victorian Silver and Silver Plate, London, 1963, p.40.

¹⁵ Hugh Honour, Goldsmiths & Silversmiths, op.cit., p.250.

¹⁶ Shirley Bury, Victorian Electroplate, op.cit., p.10.

¹⁷ Shirley Bury, Victorian Electroplate, op.cit., p.16.

¹⁸ Patricia Wardle, Victorian Silver and Silver Plate, op.cit., p.40.

¹⁹ Christopher Raub, 'The history of electroplating,' from Metal Plating, edited by La Niece and Craddock, op.cit., p.287.

²⁰ Christopher Raub, *ibid*, p.287.

²¹ Shirley Bury, Victorian Electroplate, op.cit., p.19.

²² Philippa Glanville, ed., Silver, op.cit., p.60.

²³ Shirley Bury, Victorian Electroplate, op.cit., p.23.

²⁴ Shirley Bury, Victorian Electroplate, op.cit., p.24.

²⁵ Hugh Honour, Goldsmiths & Silversmiths, op.cit., p.251-252.

²⁶ Shirley Bury, Victorian Electroplate, op.cit., p.19.

²⁷ Robert Child, 'Modern Electroplating and Electrofinishing Techniques,' from Metal Plating, edited by La Niece and Craddock, op.cit., p.293.

²⁸ Philippa Glanville, ed., Silver, op.cit., p.60.

²⁹ Shirley Bury, Victorian Electroplate, op.cit., p.14.

³⁰ Shirley Bury, Victorian Electroplate, op.cit., p.11.

³¹ Shirley Bury, Victorian Electroplate, op.cit., p.15.

³² Hugh Honour, Goldsmiths & Silversmiths, op.cit., p.253.

³³ In conversation with Angus Patterson, curator of V&A Metalwork Department.

REPLACING SHEFFIELD PLATE

- ³⁴ Eric Turner, 'Silver Plating in the 18th Century,' from Metal Plating, op.cit., p. 213.
- ³⁵ Henri Bouilhet, Christoffle, op.cit., p. 25.
- ³⁶ Peter Thornton, Form and Decoration: Innovation in the Decorative Arts 1470-1870, London, 1998, p.202.
- ³⁷ Claude Blair, ed., The History of Silver, London, 1987, p. 125.
- ³⁸ Shirley Bury, Victorian Electroplate, op.cit., p. 26.
- ³⁹ John Wilson, Silver & Plate, London, 1994, p. 136.
- ⁴⁰ Phillippa Glanville, Silver, op.cit., p. 46.
- ⁴¹ Stephen J. Helliwell, Understanding Antique Silver Plate, Aberdeen, 1997, p. 138.
- ⁴² V&A object records for the candelabrum.
- ⁴³ Eric Turner, 'Silver Plating,' op.cit., p. 215-216.
- ⁴⁴ In conversation with Angus Patterson.
- ⁴⁵ Eric Turner, 'Silver Plating,' op.cit., p. 215.
- ⁴⁶ Shirley Bury, Victorian Electroplate, op.cit., p.22.
- ⁴⁷ John Culme, Nineteenth-Century Silver, London, 1977, p. 12.
- ⁴⁸ Elkington's pattern book, Birmingham, 1847.
- ⁴⁹ John Culme, Nineteenth-Century Silver, op.cit., p.11.
- ⁵⁰ Patricia Wardle, Victorian Silver, op.cit., p. 44.
- ⁵¹ Shirley Bury, Victorian Electroplate, op.cit.,p.23.
- ⁵² Patricia Wardle, Victorian Silver, op.cit., p.32.
- ⁵³ Shirley Bury, Victorian Electroplate, op.cit., p.24.
- ⁵⁴ Shirley Bury, Victorian Electroplate, op.cit., p.25.
- ⁵⁵ Shirley Bury, Victorian Electroplate, op.cit., p.25.
- ⁵⁶ Patricia Wardle, Victorian Silver, op.cit., p.39.
- ⁵⁷ Patricia Wardle, Victorian Silver, op.cit., p.39.

FACTORY CONDITIONS

- ⁵⁸ John Culme, Nineteenth Century Silver, op.cit., p.13.
- ⁵⁹ Philippa Glanville, Silver, op.cit., p.60.
- ⁶⁰ Stephen J. Helliwell, Understanding, op.cit., p.147.
- ⁶¹ Stephen J. Helliwell, Understanding, op.cit., p.140.
- ⁶² John Culme, Nineteenth Century Silver, op.cit.,p.40.
- ⁶³ John Culme, Nineteenth Century Silver, op.cit., p.39.
- ⁶⁴ Stephen J. Helliwell, Understanding, op.cit., p.140.
- ⁶⁵ John Culme, Nineteenth, op.cit., p.55.
- ⁶⁶ John Culme, Nineteenth, op.cit., p.36.
- ⁶⁷ John Culme, Nineteenth, op.cit., p.36.
- ⁶⁸ John Culme, Nineteenth, op.cit., p.40.
- ⁶⁹ John M. Mackenzie, The Victorian Vision, op.cit., p.148.
- ⁷⁰ Lionel Lambourne, Victorian Painting, London, 1999, p.241.
- ⁷¹ John M. Mackenzie, The Victorian Vision, op.cit., p.205.
- ⁷² John Culme, Nineteenth Century, op.cit., p.40.
- ⁷³ Friedrich Engels, Condition of the Working Class In England, Oxford, 1999 edition, p.129.

CHAPTER 2-MARKETING: THE ART OF ADVERTISING AND BUYING ELECTROPLATE REACHING A WIDE AUDIENCE

- ⁷⁴ John Culme, Nineteenth Century Silver, op.cit., p.57.
- ⁷⁵ John M. Mackenzie, The Victorian Vision, op.cit., p.218.
- ⁷⁶ John M. Mackenzie, The Victorian Vision, op.cit., p. 220.

- 77 The Graphic, November 7, 1874, p.449.
 78 Patricia Wardle, Victorian, op.cit., plate 11.
 79 Maurice Baren, Victorian Shopping, London, 1998, p.6.
 80 Philippa Glanville, Silver, op.cit., p.60.
 81 John M. Machenzie, The Victorian Vision, op.cit., p.158.
 82 John Gloag, Victorian Comfort: A Social History of Design, London, 1973, p.158.
 83 Sara Paston-Williams, The Art of Dining, London, 1995, p. 266.
 84 V&A loan records for the Midland Hotel entrée dish cover.
 85 John Gloag, Victorian Comfort, op.cit., p.155.
 86 Elkington Catalogue, Birmingham, c.1900, p.10.
 87 V&A loan records for the Midland Hotel entrée dish cover.
 88 John Culme, Nineteenth Century Silver, op.cit., p.105.
 89 Claude Blair, The History of Silver, op.cit., p.158.
 90 Hugh Honour, Goldsmiths & Silversmiths, London, 1971, p.253..
 91 Elkington's Pattern Book, Birmingham, 1847.
 92 John Culme, Nineteenth, op.cit., p.188.
 93 Philippa Glanville, Silver, op.cit., p.105.
 94 Claude Blair, The History, op.cit., p.157.

SYMBOLS OF A NEW CLASS

- 95 Philippa Glanville, Silver, op.cit., p.46.
 96 John Gloag, Victorian Taste, Newton Abbot, 1962, p.136.
 97 Janet Wolff and John Seeds, eds., The Culture of Capital, Manchester, 1988, p. 68..
 98 Wolff and Seed, The Culture, op.cit., p.65.
 99 Shirley Bury, Victorian Electroplate, op.cit., p.40.
 100 Hugh Honour, Goldsmiths, op.cit., p.253.
 101 John Culme, Nineteenth, op.cit., p.55.
 102 Hugh Honour, Goldsmiths, op.cit., p.253.
 103 Stephen J. Helliwell, Understanding, op.cit., p. 138.
 104 Hugh Honour, Goldsmiths, op.cit., p.251.
 105 Hugh Honour, Goldsmiths, op.cit., p.251.
 106 John Gloag, Victorian Taste, op.cit., p. 136.
 107 Sara Paston-Williams, The Art of Dining, op.cit., p. 266.
 108 John M. Mackenzie, The Victorian, op.cit., p.52.
 109 Jane Ransome, Cookery and Domestic Economy for Young Housewives, Edinburgh, 1848, p.116.
 110 Stephen J. Helliwell, Understanding, op.cit., p. 139.
 111 Charles Dickens, Our Mutual Friend, London, 1997 edition, p.135.
 112 John M. Mackenzie, The Victorian, op.cit., p.53.
 113 Charles Dickens, Our Mutual Friend, op.cit., p.135.
 114 Patricia Wardle, Victorian, op.cit., p.23.

NEW MARKINGS

- 115 Philippa Glanville, Silver, op.cit., p.116.
 116 Philippa Glanville, Silver, op.cit., p.117.
 117 Philippa Glanville, Silver, op.cit., p.116.
 118 Shirley Bury, Victorian Electroplate, op.cit., p.19.
 119 Claude Blair, History, op.cit., p.234.
 120 Claude Blair, History, op.cit., p.235.
 121 Claude Blair, History, op.cit., p.236.
 122 Shirley Bury, Victorian Silver, op.cit., p.34.
 123 Shirley Bury, Victorian Silver, op.cit., p.39.
 124 Shirley Bury, Victorian Silver, op.cit., p.30.
 125 Joel Langford, Silver: A Practical Guide to Collecting Silverware, London, 1996, p.73.

¹²⁶ Stephen J. Helliwell, Understanding, op.cit., p.218.

CHAPTER 3-DESIGN: FROM CHALLENGING TO EMBRACING ELECTROPLATE THE GREAT EXHIBITIONS AND THE DILEMMAS OF DESIGN

FELIX SUMMERLY: QUESTIONING DESIGN IN INDUSTRY

- ¹²⁷ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.14.
- ¹²⁸ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.17.
- ¹²⁹ Patricia Wardle, Victorian, op.cit., p.49.
- ¹³⁰ John Culme, Nineteenth, op.cit., p.26.
- ¹³¹ John Culme, Nineteenth, op.cit., p.26.
- ¹³² Henry Cole, Fifty Years of Public Work, London, 1884, Volume 1, p.107.
- ¹³³ John Culme, Nineteenth, op.cit., p.26.
- ¹³⁴ Patricia Wardle, Victorian, op.cit., p.22.
- ¹³⁵ Anthony Burton, Vision and Accident, London, 1999, p.30.
- ¹³⁶ Shirley Bury, Victorian, op.cit., p.52.
- ¹³⁷ Patricia Wardle, Victorian, op.cit., p.53.
- ¹³⁸ Shirley Bury, Victorian Electroplate, op.cit., p. 48.
- ¹³⁹ Shirley Bury, Victorian Electroplate, op.cit., p. 47.
- ¹⁴⁰ Jules Lubbock, The Tyranny of Taste, London, 1995, p. 255.

THE GREAT EXHIBITIONS: PAST OR PRESENT AESTHETICS?

- ¹⁴¹ Jeffery A. Auerbach, The Great Exhibition, op.cit., p. 23.
- ¹⁴² Jeffery A. Auerbach, The Great Exhibition, op.cit., p.17.
- ¹⁴³ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.23.
- ¹⁴⁴ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.121.
- ¹⁴⁵ John M. Mackenzie, The Victorian Vision, op.cit., p. 177.
- ¹⁴⁶ Patricia Wardle, Victorian, op.cit., p.37.
- ¹⁴⁷ Patricia Wardle, Victorian, op.cit., p.37.
- ¹⁴⁸ Paul Atterbury, ed., A.W.N. Pugin: Master of Gothic Revival, London, 1995, p.298.
- ¹⁴⁹ Jules Lubbock, Tyranny of Taste, op.cit., p.246.
- ¹⁵⁰ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.114.
- ¹⁵¹ Jules Lubbock, Tyranny of Taste, op.cit., p.246.
- ¹⁵² Jeffery A. Auerbach, The Great Exhibition, op.cit., p.117.
- ¹⁵³ Paul Atterbury and Clive Wainwright, Pugin: A Gothic Passion, London, 1994, p.136.
- ¹⁵⁴ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.114.
- ¹⁵⁵ A.W. N. Pugin, The True Principles of Christian Architecture, London, 1841, p.24.
- ¹⁵⁶ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.118.
- ¹⁵⁷ Shirley Bury, Victorian Electroplate, op.cit., p.36.
- ¹⁵⁸ Shirley Bury, Victorian Electroplate, op.cit., p.37.
- ¹⁵⁹ Jeffery Auerbach, The Great Exhibition, op.cit., p.172.
- ¹⁶⁰ John M. Mackenzie, The Victorian Vision, op.cit., p.16.

THE EXAMPLES OF ELECTROTYPES

- ¹⁶¹ Jeffery A. Auerbach, The Great Exhibition, op.cit., p.199.
- ¹⁶² Jeffery A. Auerbach, The Great Exhibition, op.cit., p. 199.
- ¹⁶³ Elspeth Moncrieff, 'Victorian Electrotypes,' The Antique Collector, March 1988, p. 1 of article.
- ¹⁶⁴ Elspeth Moncrieff, 'Victorian Electrotypes,' op.cit., p.1.
- ¹⁶⁵ Mark Jones, Fake?, op.cit., p.252.
- ¹⁶⁶ Claude Blair, The History, op.cit., p.92.
- ¹⁶⁷ Shirley Bury, Victorian Electroplate, op.cit., p.49.
- ¹⁶⁸ Elspeth Moncrieff, 'Victorian Electrotypes,' op.cit., p.5 of article.

- 169 Shirley Bury, Victorian Electroplate, op.cit., p.49.
 170 Elspeth Moncrieff, 'Victorian Electrotypes,' p.3 of article.
 171 Richard Krautheimer, Lorenzo Ghiberti, Princeton, 1982, p.208.
 172 Shirley Bury, Victorian Electroplate, op.cit., p.48.
 173 Patricia Wardle, Victorian, op.cit., p.76.
 174 Shirley Bury, Victorian, op.cit., p.45.
 175 Stephen J. Helliwell, Understanding, op.cit., p.143.
 176 Museum object records for the Milton Shield electrotype.
 177 Stephen J. Helliwell, Understanding, op.cit., p.143.
 178 Elspeth Moncrieff, 'Victorian Electrotypes,' op.cit, p.1.
 179 Elspeth Moncrieff, 'Victorian Electrotypes,' op.cit., p.2 of article.
 180 V&A museum label copy under the heading 'Electrotypes'
 181 As shown in V&A storage and in conversation with Angus Patterson.

EMBRACING NEW TECHNOLOGY: LATER EXHIBITIONS AND ELECTROFORMING

- 182 Shirley Bury, Victorian Electroplate, op.cit., p.39.
 183 Patricia Wardle, Victorian, op.cit., p.190.
 184 Joel Langford, Silver, op.cit., p.73.
 185 John M. Mackenzie, The Victorian Vision, op.cit., p.272.
 186 V&A restoration records for the Hereford Screen. The Screen has recently been restored and is in the Museum's Ironwork Gallery.
 187 'The Conservation & Restoration of the Hereford Screen,' V&A brochure publication, London, 2001, right outside leaf.
 188 'The Conservation,' op.cit., left inside leaf.
 189 John M. Mackenzie, Victorian Vision, op.cit., p.16.
 190 Object records for Elkington electroformed vase.
 191 Phillippa Glanville, Silver, op.cit., p.65.
 192 John M. Mackenzie, Victorian Vision, op.cit., p.303.
 193 Claude Blair, The History, op.cit., p.163.
 194 John Culme, Nineteenth, op.cit., p.207.
 195 Stephen Escritt, Art Nouveau, London, 2000, p.50.
 196 John Culme, Nineteenth, op.cit., p.206.
 197 John Fleming and Hugh Honour, Dictionary of Decorative Arts, London, 1989, p.287.
 198 John Culme, Nineteenth, op.cit., p.206.

INNOVATIVE AESTHETICS DESIGNED FOR INDUSTRY: CHRISTOPHER DRESSER

- 199 Widar Halén, Christopher Dresser, Oxford, 1990, p.191.
 200 Patricia Wardle, Victorian, op.cit., p.174.
 201 Widar Halén, Christopher Dresser, op.cit., p.10.
 202 Halén, Christopher, op.cit., p.10.
 203 Halén, Christopher, op.cit., p.10.
 204 Halén, Christopher, op.cit., p.10.
 205 Patricia Wardle, Victorian, op.cit., p.174.
 206 Owen Jones, The Grammar of Ornament, London, 2001 edition, originally 1856, p.24.
 207 Halén, Christopher, op.cit., p.12.
 208 Halén, Christopher, op.cit., p.145.
 209 Wardle, Victorian, op.cit, p.176.
 210 Wardle, Victorian, op.cit., p.177.
 211 Wardle, Victorian, op.cit., p.177.
 212 Wardle, Victorian, op.cit., p.177.
 213 Christopher Dresser, Principles of Victorian Decorative Design, New York, 1995, p.140.
 214 Halén, Christopher, op.cit., p.145.

- 215 Halén, Christopher, op.cit., p.10.
 216 Christopher Dresser, Principles of Victorian Decorative Design, op.cit., p.140.
 217 Halén, Christopher, op.cit., p.36.
 218 Halén, Christopher, op.cit., p.46.
 219 Halén, Christopher, op.cit., p.17.
 220 Halén, Christopher, op.cit., p.46.
 221 Shirley Bury, Victorian Electroplate, op.cit., p.56.
 222 Charlotte and Peter Fiell, Design of the 20th Century, London, 1999, p.220.
 223 Paul Greenhalgh, Art Nouveau, London, 2000, p.128.

NEW STYLES AND TRADITIONAL VALUES: THE ARTS AND CRAFTS RESPONSE

- 224 Stephen Escritt, Art Nouveau, op.cit., p.32.
 225 Stephen Escritt, Art Nouveau, op.cit., p.32.
 226 Alan Crawford, C.R. Ashbee: Architect, Designer, and Romantic Socialist, London, 1985, p.32.
 227 Crawford, C.R. Ashbee, op.cit., p.330.
 228 Crawford, C.R. Ashbee, op.cit., p.338.
 229 Bury, Victorian Electroplate, op.cit., p.60.
 230 Bury, Victorian Electroplate, op.cit., p.60.
 231 Bury, Victorian Electroplate, op.cit., p.60.
 232 Alan Crawford and Shirley Bury, editors, C.R. Ashbee: Modern English Silverwork, London, 1974, p.10.
 233 Philippa Glanville, Silver, op.cit., p.64.
 234 Crawford, C.R. Ashbee, op.cit., p.141.
 235 Stephen Escritt, Art Nouveau, op.cit., p.35.
 236 Crawford, C.R. Ashbee, op.cit., p.218.
 237 Crawford, C.R. Ashbee, op.cit., p.327.
 238 Crawford, C.R. Ashbee, op.cit., p.327.
 239 Paul Greenhalgh, Art Nouveau, op.cit. p.225.
 240 Crawford, C.R. Ashbee, op.cit., p.328.
 241 Crawford, C.R. Ashbee, op.cit., p.331.
 242 Crawford, C.R. Ashbee, op.cit., p.328.
 243 Shirley Bury, 'New Light on the Liberty Metalwork Venture,' Bulletin of the Decorative Art Society, no.1, p.111.
 244 Annelies Krekel-Aalberse, Art Nouveau and Art Deco Silver, New York, 1989, p.28.

CONCLUSION

- 245 Henri Bouilhet, Christofle, op.cit., p. 253.

TRACING ELECTROPLATE AFTER ITS DECLINE

- 246 Shirley Bury, Victorian Electroplate, op.cit., p. 60.
 247 In conversation with Angus Patterson.
 248 Claude Blair, ed., The History of Silver, op.cit., p.216.
 249 Advertisement, no author, <http://www.demon.co.uk/dayco/cutlery.html>, as of September, 2001.
 250 Leslie Lewis, 'Tooting the Electroforming Horn,' Design Engineering, February 1997, p.38.
 251 Claude Blair, ed., The History of Silver, op.cit., p.224.
 252 Charlotte and Peter Fiell, Design of the 20th Century, London, 1999, p.37.

□ **BIBLIOGRAPHY**

- Atterbury, Paul, ed. A.W.N. Pugin: Master of Gothic Revival, London, 1995.
- Atterbury, Paul and Clive Wainwright Pugin: A Gothic Passion, London, 1994.
- Auerbach, Jeffery A. The Great Exhibition of 1851, London, 1999.
- Baren, Maurice Victorian Shopping, London, 1998.
- Blair, Claude, ed. The History of Silver, London, 1987.
- Bouilhet, Henri Christofle: Silversmiths Since 1830, Hachette/Chéne, 1981.
- Burton, Anthony Vision and Accident, London, 1999.
- Bury, Shirley Victorian Electroplate, London, 1971.
- Cole, Henry Fifty Years of Public Work, London, 1884, Volume I.
- Crawford, Alan C.R. Ashbee: Architect, Designer, and Romantic Socialist, London, 1985.
- Crawford, Alan and Shirley Bury, eds. C.R. Ashbee: Modern English Silverwork, London, 1974.
- Culme, John Nineteenth Century Silver, London, 1977.
- Dickens, Charles Our Mutual Friend, London, 1997 edition.

Dresser, Christopher	<u>Principles of Victorian Decorative Design</u> , New York, 1995 edition.
Elkington & Co.	<u>Elkington's Pattern Book</u> , Birmingham, 1847.
Elkington & Co.	<u>Elkington Catalogue</u> , Birmingham, c.1900.
Engels, Friedrich	<u>Condition of the Working Class in England</u> , Oxford, 1999.
Escritt, Stephen	<u>Art Nouveau</u> , London, 2000.
Fiell, Charlotte and Peter	<u>Design of the 20th Century</u> , London, 1999.
Fleming, John and Hugh Honour	<u>Dictionary of Decorative Arts</u> , London, 1989.
Glanville, Philippa, ed.	<u>Silver</u> , London, 1999.
Gloag, John	<u>Victorian Comfort: A Social History of Design</u> , London, 1973.
Greenhalgh, Paul	<u>Art Nouveau</u> , London, 2000.
Halén, Widar	<u>Christopher Dresser</u> , Oxford, 1990.
Helliwell, Stephen	<u>Understanding Antique Silver Plate</u> , Aberdeen, 1997.
Honour, Hugh	<u>Goldsmiths and Silversmiths</u> , London, 1971.
Jones, Mark, ed.	<u>Fake? The Art of Deception</u> , London, 1990.
Jones, Owen	<u>The Grammar of Ornament</u> , London, 2001 edition.

- Krautheimer, Richard Lorenzo Ghiberti, Princeton, 1982.
- Krekel-Aalberse, Annelies Art Nouveau and Art Deco Silver, New York, 1989.
- La Niece, Susan and Paul Craddock, ed. Metal Plating and Patination, London, 1993.
- Lambourne, Lionel Victorian Painting, London, 1999.
- Langford, Joel Silver: A Practical Guide to Collecting Silverware,
London, 1996.
- Lewis, Leslie 'Tooting the Electroforming Horn,' Design
Engineering, February 1997, pgs.37-38.
- Lubbock, Jules The Tyranny of Taste, London, 1995.
- Mackenzie, John M., ed. The Victorian Vision, 2001.
- Moncrieff, Elspeth 'Victorian Electrotypes,' The Antique Collector,
March 1988, no page numbers.
- Paston-Williams, Sara The Art of Dining, London, 1995.
- Pugin, A.W.N. The True Principles of Christian Architecture,
London, 1841.
- Ransome, Jane Cookery and Domestic Economy for Young
Housewives, Edinburgh, 1848.
- Thornton, Peter Form and Decoration: Innovation in the Decorative
Arts 1470-1870, London, 1998.

