Baxter prints

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Abstract

In 1835 the English printer George Baxter (1804–1869) patented a process for colour printmaking, which he hoped would become a low-cost way to reproduce oil paintings as affordable artworks for the general public. Baxter prints are a combination of two traditional printing methods, intaglio and relief, using oil-based inks. Eventually superseded by colour lithography, Baxter's process fell into disuse, becoming an interesting sidenote in the history of colour printing.

Baxter prints are often found in small numbers within Australian collections, both public and private. A Baxter print may have been produced by George Baxter himself, by one of his licensees, or by other printers following the expiration of his original patent. Lithographic copies were also produced, in time.

The State Library of Victoria owns two Baxter-process prints, *News from Australia* (1854) and *Australia – News from Home* (1853), listed on the catalogue as chromolithographs. This paper describes the process of establishing whether these prints were produced by Baxter himself, or by one of his patent holders. A search of book collections was also conducted, to determine whether the library owned further Baxter prints in the form of book illustrations. The prints were compared to other Baxter prints in private collections, for identification purposes, to study general deterioration patterns and to develop treatment guidelines for these unusual artefacts.

Introduction

George Baxter, printer in oils, is generally considered the first commercially successful colour printer in Western society (Gascoigne 1995/1986: Section 29). The 19th century was a period of great experimentation within the printing industry, with an ever-increasing emphasis on faster and cheaper print production methods. Various artists and tradesmen had experimented with colour printing techniques in the preceding centuries,

including William Savage, John Baptist Jackson and J C Blon (Peddie 1917: pp40–43, Lewis 1908: pp31–34), but colour images remained labour-intensive and expensive to produce. A more affordable option than hand-coloured works, Baxter's prints appealed to the growing middle class of the 19th century (McLean 1963: pp24–25). Though Baxter's mixed-method process was developed some thirty years later than Senefelder's lithographic technique, lithography was slow to take hold in England, particularly in artistic circles. However, by the end of the century half-tone and colour lithographic processes had become the primary means of production in a now highly mechanised industry (Wakeman and Bridson 1975: pv). Comparatively expensive and labourious in turn, Baxter's patent process became yet another technological dead end.

While Baxter prints would seem a rarity on first glance, it is estimated that Baxter himself printed over twenty million prints during his career (Mitzman 1978: p50). While not all of Baxter's twenty million prints would have survived to the 21st century (and this estimate may also include Baxter's non-colour work, which was extensive), Baxter prints and Baxter-process prints can often be found in Australian 19th-century collections.

In particular, there may be an as yet undiscovered richness of Baxter-process prints contained in Australia's book collections. A search of the State Library of Victoria's online catalogue revealed only two listed Baxter prints; however, a more in-depth manual search revealed another 38 prints within books belonging to the Rare Books and general collections. Prints belonging to both the State Library and to private individuals were surveyed for the purposes of this paper, in order to document common physical characteristics. As Baxter's materials and techniques require that some care be taken when formulating conservation treatment programs, it is important that conservators can correctly identify prints produced using his process.

Who was George Baxter?

Baxter was born in 1804 in Lewes, Sussex, and was the second son of John Baxter, a printer. At 20 Baxter was illustrating books printed by his father; at 23 Baxter moved to London to be apprenticed to Mr Williams, a wood engraver. In 1827 Baxter set up business on his own and married Mary Harrild, daughter of Robert Harrild, a printing engineer and a friend of

Baxter's father. Baxter now began to experiment with his own methods of colour printing – his first known colour print, *Butterflies*, was published in 1829 (Etheridge 1929: pp17–18).

In 1835 Baxter was granted *Patent No. 6916 – Improvements in Producing Coloured Steel Plate, Copper Plate and other Impressions*, which outlined the combined intaglio and relief process he would continue to use for the next thirty years. Baxter's original patent ran for 14 years; after the renewal of his patent in 1849 for another five years he began to sell licenses for the use of his printing process to other printing firms (Etheridge 1929: p18).

Baxter initially used his process predominantly for book illustrations – for example, those produced by John Snow, publisher for the London Missionary Society (Mitzman 1978: pp28–32). In 1837 Baxter was commissioned by the publishers Chapman & Hall to produce illustrations for *The Cabinet of Paintings*, his first attempt at reproducing famous oil paintings as "art for the masses" and still Baxter's most accomplished and well-known work (Mitzman 1978: pp20–21).

Baxter advertised his prints using such phrases as "Oil Colour Printing" and "Printed in Oils", most likely to emphasise a connection with oil paintings rather than oil-based inks, which were not unusual in themselves at that time (Lewis 1928: pp37–41). Those accustomed to 18th-century copper engravings saw lithography and steel engravings as an unsatisfactory and cheap substitute (Ray 1976: pxx) and, although commercial lithography was flourishing by the middle of the 19th century, it was certainly scorned by English artists and aesthetes – in the words of John Ruskin, "… let no lithographic work come into the house if you can help it" (Pennell and Pennell 1915: p110). Baxter's advertising may also have been an attempt to distance himself from this kind of product, as well as from the hand-colouring trade (Lewis 1928: pp39–41).

Later in his career, Baxter moved away from book publishing and produced greater quantities of 'presentation prints', colour prints sold on specially stamped mounts for individual sale. His work was well known and successful enough for Baxter to be appointed to record such events as the coronation of Queen Victoria and the opening of her first parliament (Etheridge 1929: pp19–21).

As well as producing prints for book illustrations and sheet music,

Baxter's prints were pasted onto various products, including needle-boxes, notepaper (Mitzman 1978: p42) and ladies' card baskets (Clarke 1919: p48), or were sold individually for people to collect in scrapbooks or to frame (McLean 1963: p124). Lewis (1919: p72) thinks it likely that many of his prints were intended to be used as Christmas cards, which were invented in 1844 by C T Dobson. Often the same print can be found in a number of different formats – presentation print, sheet music and book illustration.

Despite his technical excellence and the general popularity of his prints, Baxter's business was never profitable – his process was laborious and it seems likely that his perfectionism prevented him from completing many of his commissioned works on time (Mitzman 1978: p20 & 49). In 1860 he held a sale of all his stock and equipment, most of which was not sold. Eventually he sold his plates and blocks to the printer Vincent Brooks, who later republished some of Baxter's images (Etheridge 1929: pp22–23). Baxter was declared bankrupt in 1865 and died in 1867, after an accident involving a horse omnibus (Lewis 1908: pp29–30).

Baxter's prints, being mostly commissioned works, often depicted topical Victorian themes – historical events, famous personages and missionary journeys. They included various illustrations for children's and ladies' journals. While many of these prints were reproductions of contemporary oil paintings and those of the masters, many others were his own work. As such, Baxter's works provide an interesting pictorial record of the Victorian era.

Aesthetic opinions of Baxter's work vary widely – Hind (1963/1923: p311) states that Baxter's work "… covers one of the dullest epochs in English painting, and the artistic value of the majority of his reproductions is correspondingly small …" However, most critics at least agree that his work is technically excellent.

What is a Baxter print?

A Baxter print is generally considered to be any print produced by George Baxter himself, his licensees or other printers using his method after the expiration of his patent – and undoubtedly some who used it before his allotted patent period had ended (Etheridge 1929: p24). Baxter's process was in common use until the 1870s (Gascoigne 1995/1986: Section 29)

and can be found in book illustrations and other colour printed material from this era.

Baxter's process for producing colour prints combined relief and intaglio printing methods. A 'key' plate was prepared, usually made of steel and using any combination of engraving, stipple, etching and aquatint. A few examples have also reportedly been found where Baxter appears to have used mezzotint and lithography to create his key plate. The key plate provided the main lines of the image and much of the tone, light and shade. It was usually printed in a neutral tone, such as light grey or terracotta (McLean 1963: p30). Often Baxter used more than one colour to ink the key plate – for example, to gradate the image from blue in the sky, to buff in the middle distance and to a darker colour in the foreground; i.e. inking the plate *à la poupée*. (Gascoigne 1995/1986: Section 29, Seeley 1924–25: p5). Usually Baxter used aquatint for landscapes and stipple to work faces and figures (Lewis 1928: p199).

Following printing of the key plate, relief blocks were prepared, usually from wood but also from zinc or copper, using impressions of the key plate to create the blocks (Wakeman and Bridson 1975: p8). Usually one block was prepared for each colour, although sometimes two or more colours or tints were included on the same block, requiring hand inking of each individual area. Each colour was applied and allowed to dry before adding the next colour. It is thought that Baxter usually started printing with a blue tint and then progressed through the other colours in a predetermined order – all blocks were numbered sequentially and labelled with the colour to be used. Sometimes up to 24 separate colours were used, although ten could be considered an average number. Baxter achieved his precise registration by fixing the print over a number of spikes, over which the blocks would also fit (Seeley 1924–25: pp3–4 & 12).

Baxter's licensees

A number of printers purchased a licence from Baxter, following the renewal of his patent in 1849 (see Table 1). The most well known of these was Abraham Le Blond. Other firms who worked under Baxter's license include Bradshaw & Blacklock; William Dickes; Kronheim & Co; Joseph Mansell and Myers & Co. Other printers known to have used Baxter's

methods after his patent expired included George Baxter Jr.; Vincent Brooks; Edmund Evans; Benjamin Fawcett; Gregory, Collins & Reynolds; Leighton Bros; Moor & Crosby; and William Russell (Etheridge 1929: pp26–27). George Cargill Leighton, a former apprentice of Baxter's, never

Table 1: Publishing dates for Baxter's Licensees

Licensee/printer	*Date range (approx.)*	*Discussion*
Abraham Le Blond	1849–1893	Purchases license in 1849 Le Blond sells plates and blocks to Frederick Mockler (Secretary of first Baxter Society) in 1893
Joseph Kronheim	1849–1875	Purchases license in 1849 Kronheim installs steam litho machines, ceases use of Baxter process in 1875
Vincent Brooks, later Vincent Brooks, Day & Son	to 1867	Never a licensee Vincent Brooks, Day & Son sell Baxter plates and blocks to Abraham Le Blond in 1867
Joseph Mansell	1849– at least 1858	Purchases license in 1849 Joseph Mansell purchases *Lot 3054 – Blocks and plates for Warwick Castle, Netley Abbey, River Tiefi Cardiganshire & Lake Como* in 1858, from Baxter's sale
Bradshaw & Blacklock	1851–1856	Purchases license in 1851 After death of Bradshaw in 1853 use of Baxter process wanes, but continues to be used until 1856
Myers & Co	1851–	Purchases license in 1851
William Dickes	1849–	Purchases license in 1849

Lewis 1928: p169

worked under Baxter's licence but became a prominent printer in his own right, becoming the printer and later owner of the *Illustrated London News*, the first journal in the world to include regular colour plates. Leighton could not use a metal intaglio plate as a base without infringing Baxter's patent, although "… the fact that he had to do without it probably helped to ensure his commercial success" (McLean 1963: pp139–140). Nevertheless, Leighton did often use an aquatint base (Peddie 1917: p45).

Kronheim and Dickes both used Baxter's process from 1849 onwards, and both were large suppliers of colour plates to book publishers, "competing on price rather than quality" (McLean 1963: p142). Baxter's patent process was not necessarily strictly followed by his licensees – for example, both Kronheim and Dickes were lithographic printers as well as wood engravers, and most likely mixed all of their printing methods together. In fact, it is often impossible to say exactly how a given colour print of this era has been produced (McLean 1963: p142). Generally, Baxter's licensees used fewer colour blocks than Baxter himself (Lewis 1928: p200) and, in the opinion of many, "none surpassed him in quality, being more concerned with cheapness" (McLean 1963: p33).

Identification

There are several means by which a Baxter print can be identified.

Signature, printed attributions and dimensions

Baxter helpfully included his 'signature' in or under many of his prints – for example, *News from Australia* (Survey Prints #41 & 42) contains these details at the bottom left corner of the hearthstones, as part of the image: *Published May 10th 1864/ By G. Baxter/ Proprietor & Patentee/ London* (See Table 2 for a list of Baxter's publishing addresses).

Book illustrations are also frequently easily identified by this method. It should be kept in mind, however, that others did use Baxter's own plates to reprint his images at a later date, with his signature intact – Vincent Brookes, for example, was the first to reprint Baxter's images after Baxter had retired, without making any changes to the plates. Abraham Le Blond did erase Baxter's signature from the plates he purchased, and replaced it with his own. Often this part of a Le Blond print has been trimmed by someone hoping to sell the

print as a genuine Baxter (Lewis 1908: pp55–57). Consulting the published literature can determine whether this has occurred: Baxter catalogues record the signature details that should be present, as well as the dimensions of the print itself. So, for example, if the print has no signature and is smaller than expected, it may be a Le Blond printing of Baxter's image.

Examination of printing method

Visually, Baxter prints appear very rich in colour (unless faded), with the appearance of 'texture' or three-dimensionality. They are usually heavily inked – often very little of the paper surface is visible. As the prints were usually trimmed before being bound or mounted – Baxter was known to have frequently produced two or more separate images on the same plate, for trimming later (Etheridge 1929: p45) – intaglio plate marks are rarely visible. Sometimes a slight ridge can be felt around the edge of the image, but it is the opinion of the author that this is more likely to be caused by the pressure from a relief block than the intaglio plate.

Examination with a magnifying lens or a microscope will generally detect the typical intaglio characteristics, such as the raised ink line and the distinctive marks of the stippling tool and the reticulated aquatint grain (Gascoigne 1995/1986: Section 29). However, a near-contemporary account of George Baxter's process mentions that prints were often placed between sheets of smooth zinc and passed between heavy metal rollers, at great pressure. This gave a smooth finish to the print and also to the ink, which may, in some cases, make detection of the raised intaglio ink

Table 2: Publishing dates and addresses for George Baxter

Date range	*Publishing address*
1827–1830	11 Great Distaff Lane, Cheapside
1830–1835	29 King Square, Goswell Road
1835–1844	3 Charterhouse Square
1844–1851	11 Northampton Square
1851–1860	11 & 12 Northampton Square

Wakeman & Bridson, 1975: p8

more difficult (Seeley 1924–25: p18). Baxter also often inked his intaglio plate *à la poupée* to obtain different tints for the sky and earth. The intaglio plate gave the image a dramatic quality generally not found in chromolithography. Stipple is generally found in the hands and faces of figures (Gascoigne 1995/1986: Section 29).

The 'squashed ink rim' of the relief blocks will generally also be easily visible. In addition, indentations can often be seen on the verso of the print, where the application of the relief blocks has caused the paper to become embossed (Gascoigne 1995/1986: Section 29). Some of Baxter's earlier prints were printed using only relief blocks, in which case there will be no intaglio characteristics present (Etheridge 1929: p18). For example, Baxter's illustrations for the four volumes of *History of the Orders of the Knighthood of the British Empire* by Sir Nicholas Harris Nicolas (Survey Prints #22–37) were printed entirely in blocks, apart from the frontispiece and the decorative title page, which were printed in the usual manner.

Stamped and embossed mounts

Baxter produced many different mounts for the prints he sold individually, in order to try and differentiate his work from that of competitors and imitators. These mounts had either a red 'stamp' or an embossed die-stamped seal. Baxter's dies generally contain a crown and either an oval or shield containing Baxter's name and address, with rectangles underneath bearing the name of the print (Etheridge 1929: p48). There are twenty separate red seals and fifteen embossed seals known; the differences between them are often very slight. Various references on Baxter list details of these seals, for purposes of comparison (Mitzman 1978: pp111–121, The New Baxter Society 2001, *Baxter's Seals*).

Comparison to published literature

Fortunately, there is a considerable amount of published information available on Baxter's body of work, thanks primarily to the three separate Baxter societies that have existed since the late 19th century.

Dr Lawson Tait and Frederick Mockler were amongst the first Baxterophiles; Mockler possessed the original Baxter plates and blocks purchased by Abraham Le Blond from Vincent Brookes, and issued the first catalogue of Baxter prints in 1894. The first Baxter Society began in

1895 and published the *Journal of the Baxter Society*; unfortunately only three issues were produced before the society disbanded due to financial difficulties (Mitzman 1978: pp92–93).

Courtney Lewis revived interest in Baxter's work in the early 20th century. Lewis' book *George Baxter, His Life and Work*, published in 1908, was the first definitive work on Baxter; Lewis' catalogue numbers for Baxter's prints are still used to identify prints today. The Second Baxter Society was formed in 1921, with Lewis as its president. It published the *Baxter Times* and a quarterly journal for members. The Second Baxter Society folded prior to the start of the Second World War (Mitzman 1978: pp98–106).

The New Baxter Society was formed in 1983 and has since published two useful CD-ROM catalogues – one of Baxter's works and the other of Le Blond's. The Society currently has over 150 members worldwide and publishes *The New Baxter Society Newsletter* three times per year (The New Baxter Society 2006).

Consequently, the work of George Baxter is quite well documented, despite the lack of documentary information he himself left behind. A conservator or curator can consult these publications to determine whether the image before them is a known Baxter print, and discover details of its provenance – including whether or not it was ever printed by one of Baxter's successors. Variations or 'states' can be found of Baxter's prints, as he often made changes in order to improve the composition or tone of an image (Etheridge 1929: p19). The CD-ROMs produced by the New Baxter Society are particularly useful, as they contain images of nearly every print, as well as relevant descriptions and details from the works of Courtney Lewis and others. The CD-ROMs are also keyword searchable.

Where Lewis and other early Baxter scholars, in particular, found their information is generally not referenced. Lewis described trips to the British Museum library to view books, illustrations and prints by Baxter, searching newspapers for contemporary advertisements, consulting Baxter's printed catalogues and materials held at the Patent Office, and so forth (Lewis 1919: p3 & p65). Historical references should therefore be treated with a certain amount of caution, especially as the authors do not always appear to be entirely objective in their opinions.

Materials

Baxter had a reputation for quality, not only in the care he took with production, but also with his choice of materials. Unfortunately, it was not common practice for tradesmen in any industry to record their methods for posterity and Baxter was no exception (Lewis 1928: p200, Wakeman & Bridson 1975: pvi). Without analytical analysis, the exact composition of Baxter's inks, papers and glazes is only supposition. What follows is information drawn from historical sources and the results of the survey carried out by the author.

Baxter's inks

As advertised, Baxter's inks were oil based, as was common practice at the time, and were probably based on boiled and refined linseed oil. (It should also be noted that some writers are of the opinion that Baxter's earliest colour prints were printed with water-based inks – Scanlon n.d.: *Introduction*). Baxter prepared his own inks and kept his ink recipes secret from potential competitors – even his own son (Lewis 1919: pp72–73, Seeley 1924–25, pp8–9). After grinding the pigments, Baxter undoubtedly added other components, such as egg whites (often used to brighten vermilion and Prussian blue), white lead or starch (to thicken or lighten colours), gelatine or albumen (to assist in the separation during precipitation), or lead oxides (e.g. litharge, red lead), acetate of lead, sulphate of zinc or other driers (Bloy 1967: pp38–39, Richmond n.d.: pp38–39 & pp102–103). Again, however, we cannot know the exact composition of Baxter's inks without chemical analysis.

Baxter "… believed in the very best …" and is known to have purchased relatively expensive pigments such as cochineal, cadmium yellow and cobalt (Lewis 1919: p69, Lewis 1928: p200). The blush of cheeks was often applied by hand, using a block covered with a semi-spherical pad of printers' composition coated with cochineal lake (Lewis 1919: p69). Contemporary accounts from printers who worked for licensees of the Baxter process list carmimine, madder lake, artificial vermilion (a pale tint used for flesh tones) and cobalt blue for sky effects among the colourants used by Baxter and his licensees (Seeley 1924–25: pp9–10). Another account states that Baxter used whiting to print at least one work and was thought to have

improved his ink by the addition of zinc oxide. His cadmiums were used in a manner that made them very nearly transparent (Lewis 1919: p69). Aniline colours were invented in 1856, so it is possible that later prints produced by Baxter's method include such inks, but in general Baxter's palette is likely to have been similar to any other colourist's of the time (Lewis 1928: p200).

Some of Baxter's original plates and blocks still exist in various collections. Blocks used by Baxter for printing *Day Before Marriage* are labelled 'Pale Blue', 'Yellow', 'Dull Green', 'Pale Cobalt Grey', 'Deep Violet', 'Light Brown', 'Violet and shade tint' and 'Dark Brown'. A printer who worked for a licensee of Baxter wrote that Baxter-process prints generally contained a yellow, two flesh tints (for portraits), green, two blues, three reds and a brown. Blue was usually printed first, followed by the rest of the colours in the order listed (Seeley 1924–25: p12 & p18).

Hand colouring

Baxter is thought to have used hand-colouring for finishing touches on occasion – for example, "… extra touches of red on the mouths, high white lights upon jewels …" (Seeley 1924–25: p18). Early published references on Baxter's work state that hand-colouring can easily be detected by passing a wet handkerchief over the print in order to detect hand-coloured forgeries (Etheridge 1929: p49, Lewis 1908: p60), a rather alarming recommendation.

Varnish/glaze

There was thought to be a 'secret' to the delicate appearance of Baxter's prints – Courtney Lewis (1919: p6) describes it as "… a delicate film or glaze the secret of which no one can discover or imitate, not even his licensees, which gave them the added appearance of being printed ivory". Hind (1963/1923: p311), on the other hand, describes his prints thus: "… his colour surface is always unpleasant and glossy, and mitigates against any satisfactory result". McLean (1963: p30) lists Baxter's possible 'secrets' as the larger number of colour blocks used by Baxter, compared to his licensees, Baxter's skill in selecting the colours to be engraved, the actual engraving of them, his care in obtaining an exact register in printing, and his sense of perfectionism in general. Baxter's practice of passing his prints through polished metal

plates after printing may also contribute to the polished appearance of his prints. Others thought his ink formulations were unusual, or that he applied a special glaze or varnish over the image after printing.

Seeley (1924–25: p18) states that Baxter occasionally applied glaze via an extra printing all over the image, composed of his usual varnish (linseed oil, presumably) with a 'hard drier' added to make it insoluble in water. More often, however, Seeley thought that Baxter glazed areas of the print by hand using a glaze composed of gum arabic, egg white and Castile soap. This would have made the glaze water-soluble, and indeed Lewis (1908: p57) warned his readers that "… the gloss comes off with moisture". Lewis also wrote that some of Baxter's licensees used a varnish instead of "… the delicate bloom …" used by Baxter (Lewis 1928: p203), a supposition that finds some support in the survey carried out of Baxter prints for this paper.

Baxter's papers

Lewis (1919: p69) stated that Baxter used "… the very best Dickenson paper …" and that he bought "… the very best rag paper of a quality perhaps not seen now" (1928: p200). Lewis also mentions that Baxter "tinted" some papers before printing, but does not include any information on how this process might have occurred (1919: p69). Mitzman (1978: p21) wrote that Baxter used "… a smooth letterpress method …" for tinting the papers used for printing the *Cabinet of Paintings*.

Baxter's mounts

'Red seal' mounts have George Baxter's insignia printed on the bottom margin in a red or dark brown ink. The trimmed print is adhered to the printed mount. For embossed mounts, the trimmed print was placed on the embossing plate with an adhesive spread across the back (thin starch was reportedly used) and a sheet of plain card placed on the top. The embossing plate was closed and run through the press, which caused the two sheets of paper to adhere at the same time the mount was embossed (Seeley 1924–25: p19).

Details of stamped and embossed mounts can be found in the published literature on Baxter (See Mitzman 1978: pp111–121, The New Baxter Society 2001).

Survey of prints

A total of 46 prints were surveyed, in order to determine authenticity, common physical attributes and condition problems. The following attributes were recorded on a survey form:

- publishing details and printed inscriptions
- dimensions of paper and image
- description of paper, including watermarks (if any)
- thickness of paper
- condition problems – e.g. discolouration, foxing etc (as tick boxes).

Seven of the prints were also tested for solubility of the ink.

Printed inscriptions, dimensions and general descriptions were compared to those recorded in published literature. Descriptions of paper, paper thickness and the presence of watermarks were recorded in order to establish a 'norm' for Baxter's papers.

Publishing details and printed inscriptions

Establishing the authenticity of the prints surveyed was a relatively straightforward process. Consultation of the published literature (The New Baxter Society 2001) revealed that the majority of prints surveyed were not known to have been produced by a licensee or later owners of Baxter's plates. In addition, most prints were bound in books and bore the appropriate identifying details. For example, many of the prints examined were printed during Baxter's 'Missionary' period, when he produced illustrations for the London Missionary Society's publisher, John Snow, and as such were frequently identifiable by a printed line below the image that reads *Printed in OIL COLOURS by G. Baxter, (Patentee), 3, Charterhouse Square.*

There were exceptions, however. Two copies each of *Australia – News from Home* and *News from Australia* were studied, one of each belonging to the State Library of Victoria and the other to a private collection. Both were known to have been produced by Vincent Brookes and Abraham Le Blond, amongst others. The two belonging to the State Library were identifiable as genuine Baxters, as both are mounted on authentic Baxter presentation mounts – again, this could be established by comparison to the published literature.

Comparing the privately owned prints with these brought to light some differences between the two sets. Firstly, the items in the private collection were in much poorer condition than the library's, having had a heavier display life and a higher degree of interference in general. Furthermore, on close examination, it could be seen that the register of the colours in the privately owned prints was much less precise, and the colours fewer in number and less even in their application. However, their dimensions were correct – i.e. they had not been 'trimmed' to disguise a Le Blond signature.

The privately owned *News from Australia* was also heavily varnished, which was not characteristic of Baxter's more discreet use of glaze, and the reds were 'bricky' in appearance, a characteristic of those prints produced by Vincent Brookes, according to the literature (The New Baxter Society 2001: *CL 196*). It seems likely, therefore, that these prints were reprints from Baxter's original plates, possibly by Vincent Brookes, and certainly printed by someone less concerned with perfection.

Characterisation of papers

Very little concrete information about Baxter's papers was determined from the survey. Baxter tended to print on medium-weight wove papers which were off-white (sometimes with a beige tone) with a smooth texture, sometimes rougher on the verso than on the printed surface. Only one print showed anything resembling a watermark, which appeared as an indistinct grid-like pattern. This is not surprising – printers tended to avoid areas with watermarks, as they could disrupt the appearance of the completed print. The thickness of papers measured ranged from 0.13–0.55 mm, with the median value of 0.26 mm and an average thickness of 0.27 mm.

This information may be somewhat useful when deciding on matters of attribution – for example, Mockler is known to have printed his Baxter reprints on a yellow crinkly paper (The New Baxter Society 2001: *Forgeries*) and so a print found on such paper is therefore unlikely to be a Baxter original. Cheap wood-pulp papers began to be used in books in the 1870s, and coated 'art paper', used for half-tone blocks, came into use in the 1890s, so prints on these types of papers are likely to be forgeries or by

Baxter's later successors using his process (McLean 1963: p161). Indeed, in carrying out the survey, many examples of works by printers such as Dickes and Leighton were found, and were most often printed on coated papers.

Condition problems

By and large, Baxter prints have survived into the 21st century in relatively good condition. Baxter produced his prints before the widespread adoption of mechanical wood-pulp papers and paper coatings, and he appears to have selected relatively long-lasting materials with which to create his works.

As such, most of the damage that had occurred to the 46 prints surveyed was due to external forces, such as physical damage (26% were torn, 13% were creased, 13% were scratched), contact with library stamps (50%), staining from water or another liquid (65%) and resulting distortion (20%). Half of the presentation prints surveyed had been mounted on discoloured and acidic card, and a third showed visible evidence of light exposure – fading of colours or darkening of the paper or glaze/varnish. Thirty-three per cent of all prints surveyed exhibited ingrained surface dirt, usually around the edges; 13% had been stained by ink on an adjacent page; and 13% bore small accretions.

Two prints surveyed (*Bohemian Peasants* and *Hungarian Peasants*, both frontispieces in *Sketches of Germany and the Germans* by Edmund Spencer, volumes I & II respectively) appeared to have become bleached where they had been in contact with "Public Library of Victoria" stamps – both from stamps on the verso and on the opposing page. It is not certain whether the bleaching effect was caused by direct contact with the ink, or by a later treatment to remove an ink stain.

The inherent flaw within Baxter's work may be foxing. While a number of the prints surveyed did not exhibit foxing, 43% exhibited minor foxing (scattered and/or pale) and a further 41% of the total number of prints surveyed exhibited major foxing (widespread and/or dark). In some cases it was noticeable that only the illustration plates in a volume were foxed, with the text block as a whole largely unaffected – except where in contact with Baxter's plates. This may be due to the manner in which the prints

were produced – contemporary accounts of Baxter's process describe the practice of keeping prints damp for days at a time, to allow inks to dry in between each printing while preventing the paper from shrinking. Seeley (1924–25: p11) even describes how prints were treated with chloride of lime to bleach out any signs of mildew before a print was sold. However, there is some disagreement between accounts as to whether Baxter kept his prints damp between printings or not (Lewis 1928: p202) and so it may be that the tendency for these papers to become foxed is a result of the manner in which the paper was manufactured.

While Baxter's papers appear to be of good quality and have retained strength and flexibility, 61% did show some minor discolouration, generally around the edges of the sheet. A further 30% showed moderate or major discolouration overall.

A lesser problem is breakdown of the glaze or varnish layer. Most items surveyed appeared to incorporate a glossy layer over darker or shadowed areas, and the majority of these were in excellent condition, possibly with a slight yellowish tinge. A small percentage (about 8%) exhibited crazing to some degree, with the worst example a heavily varnished specimen that is unlikely to have been printed by Baxter himself (the privately held copy of *News from Australia*, discussed previously).

Some writers have placed much emphasis on the quality of Baxter's inks, claiming that they did not cause brown staining like many poorer-quality inks – a fault attributed variously to insufficient boiling of the linseed oil base, poor grinding and mixing, too short a time in storage, and/or the addition of rosin (Bloy 1967: pp88–91). However, while Baxter's inks are undoubtedly fine, the survey showed that nearly 48% of the prints surveyed had caused brown discolouration on the adjacent page, usually where the paper was in contact with a dark green, brown or black ink – or possibly with a glaze used over darker colours.

The results discussed above should be considered in light of the composition of the survey population – predominantly book illustrations. Such prints would be expected to have remained in better condition than a print on display, as they would generally have had less exposure to light, pollutants, humidity and other agents of deterioration. A survey containing a higher proportion of presentation prints may reveal quite different results.

Figure 1. Detail of varnished copy of *News from Australia*, showing bloom caused by application of 50:50 water:ethanol solution.

Solubility of inks

The inks on seven prints were tested for solubility in water, 50:50 water: ethanol, 100% ethanol and 100% acetone. While not every colour in each print was tested, a minimum of at least six colours was tested from each print. All inks tested were insoluble in all solvents tested and were slow to wet out, but wetted more quickly with an increase in ethanol or acetone content.

A yellow substance was solubilised in all solvents from areas of the copy of *News from Australia* belonging to a private collection; this was thought to be the deteriorated varnish that was visible over the surface of the work. This varnish exhibited another interesting effect during the solubility tests; the application of water and the 50:50 water:ethanol solution caused the surface to take on a whitish, opaque appearance, obscuring the colours below (see Figure 1). The effect was most dramatic with the application of the 50:50 water:ethanol solution, but could be reversed by brushing

the area with 100% ethanol. This effect is most likely a 'bloom' caused by hydration of the varnish, reversed with the dehydrating effect of pure ethanol. This, of course, has implications for wet treatment options.

Conservation

During the course of the survey the opportunity arose to treat four separate Baxter prints, although not ones from the library's collection. Three (*The Chalees Satoon*, *News from Australia* and *Australia – News from Home*) required removal of previous backing material prior to reframing, and one (*Lugano*) was washed in order to gauge the effect of wet treatments on Baxter's inks. (This latter print belongs to the author. See Figure 2.)

The backing removals were carried out by wetting areas of paper and adhesive with water and removing them with a septum elevator. The prints were subsequently humidified by using a Gore-tex™ 'sandwich', where a sheet of Gore-tex™ is placed between wet blotters and the print, the whole covered by a sheet of plastic, and allowing the water vapour passing through the Gore-tex™ to relax the paper fibres. The prints were pressed between felts to dry. No adverse effects were observed in either the inks or the varnish, even with the heavily varnished copy of *News from Australia*.

The print that was washed (*Lugano*) did have a visible glaze applied to some areas, and so a washing method was selected that would minimise interference with this layer. Standard immersion washing would have most probably solubilised any glazes and removed them from the print; and washing on a suction table might have pulled solubilised glaze through the paper. For this reason it was decided to use the blotter washing technique, which, although the capillary 'pull' can be very strong, allows for a little more control over application of wash solutions to the surface of the print.

The print was first humidified using Gore-tex™ and water vapour, and then washed by placing the print on blotting paper that had been saturated with deionised water adjusted to pH 8.5 with saturated calcium hydroxide. The print became saturated quickly and easily and yellow staining material was removed from the paper almost immediately. When wet the areas of relief printing were more obvious, as was the shine of areas where glaze

had been applied (see Figure 3). It appeared as if the glazed areas became slightly cloudy during the wash but this effect did not appear to remain on drying, if it was indeed present at all – visual subjectivity is an issue during treatment! Three blotter changes were made; however, although a large amount of staining material was removed, the paper remained reasonably discoloured overall.

The paper was allowed to air dry considerably before pressing, to ensure softened glazes were not touched to surfaces too soon. During air drying, areas of the sheet appeared to dry differentially, revealing a strong diagonal pattern of 'lines' within the paper. It was not clear whether this was an indication of grain direction, a characteristic of the sheet formation (e.g. lines of thicker and thinner pulp) or the effect of some other papermaking process, such as sizing. Regardless, cockling was no more marked than during any other air drying procedure. Before pressing, however, the print was remoistened using a dahlia sprayer containing water with some ethanol added (less than 25%) as an experiment to see if this caused the glaze to become opaque – no change was observed. After drying, it did appear that perhaps the glazed areas had diminished slightly in their level

Figure 2. *Lugano*, before treatment.

Figure 3. Detail of *Lugano* during treatment (blotter washing), showing areas of gloss and relief.

of gloss; again, however, this was difficult to determine, as the effect of the glaze had always been quite subtle.

Recommendations for conservation treatment

As a result of the survey and the treatment carried out on the few examples described, there are some general recommendations that can be made for the treatment of Baxter prints, and indeed any colour print from Baxter's era.

- The presence of a glaze, most likely water soluble, over areas of the prints begs care when using wet treatments. If wet treatment is necessary, methods should be chosen that minimise disturbance of the surface – for example, blotter washing and humidification with Gore-tex™.
- It may be prudent to avoid direct application of water and ethanol mixes to the surface, particularly to those works that are obviously varnished.

- Highly alkaline wash solutions may cause a saponification reaction with oil-based inks.
- When carrying out solubility tests, inspect areas of red and white highlights, in particular, for hand colouring – for example, lips, cheeks and jewels.
- Some of Baxter's earlier prints may have been executed using water-based inks, again calling for care when carrying out wet treatments.
- Original Baxter mounts should be retained.
- When pressing Baxter prints, be mindful that the surface of these works can have a three-dimensional quality, and that too much pressure on a wet paper could over-flatten the effect of the relief blocks.

The fact that Baxter licensed his patent means that it can be difficult to determine whether an image was printed by himself, a patentee or by another printer who purchased his blocks at a later date. From a conservation perspective this distinction is not necessarily important, as the process is still essentially the same. However, it is likely that the inks, papers and finishing techniques used by Baxter's patentees and imitators differed from his own and this may have some bearing on conservation treatments – for example, the solubility of inks may vary, papers may have deteriorated differently, and so on.

Recommendations for storage and display

In addition to the normal recommendations for the storage and display of paper items, the following recommendations may be considered:

- As colour prints, Baxter prints fall into the 'fugitive' light-fastness category and so exhibition exposure times should be planned accordingly. As well as colour fading, yellowing of the varnish or glaze may be an issue.
- It is recommended that illustration plates in books are interleaved to prevent transference of acidic substances, inks and other contaminants from adjacent pages. Usually there are only a small number of colour illustration pages in a volume, so this should not place too much strain on bindings.
- Baxter prints are highly collectible; during the survey many volumes were found where illustration plates had been removed. It would be worthwhile removing books containing Baxter prints from open access and making sure they are accessed only under supervision.

Conclusion

Although not to everyone's taste, Baxter prints are carefully crafted, delicate examples of a master printer. His works provide a fascinating glimpse into both the ethos and industry of the mid-19th century, and, although colour lithography eventually became the colour printing method of choice, it is most likely true that, as *The Morning Post* reported in 1859: "… Baxter's process of printing pictures in oil colours … has certainly done more than any other modern discovery to make the great mass of people fond of good pictures and familiar with them" (*A brief history of Baxter and Le Blond colour prints* n.d.: p3). It is hoped that this paper has done the same for Baxter's prints.

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