Seeing Red

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In 2011–12 Tate Britain mounted a major exhibition dedicated to the painter and printmaker John Martin (1789–1854). His most sensational painting, *Belshazzar's Feast* (1820), was displayed alongside works illustrating how others capitalized on its success through imitation and copying (*Fig. 1*). These were all prints of some form except one, the 'most striking', painted on a large piece of glass (*Fig. 2*).[1] As a curiosity closely associated with Martin's early career as a glass painter, this has a long-established presence within the written history of Martin's work.[2] In the accompanying publication the

Fig. 1: John Martin, *Belshazzar's Feast*, 1820, oil on canvas, 160 × 249 cm, private collection. © Christie's Images/Bridgeman Images.

[1] Martin Myrone and Anna Austen, 'Catalogue', in *John Martin: Apocalypse*, ed. by Martin Myrone (London: Tate Publishing, 2011), pp. 61–213 (pp. 106–07).

[2] Richard and Samuel Redgrave, *A Century of Painters of the English School*, 2 vols (London: Smith, Elder, 1866), II, 423–37 (p. 429); Thomas Balston, *John Martin 1789–1854: His Life and Works* (London: Duckworth, 1947), pp. 31, 58; Richard D. Altick, *The Shows of London* (Cambridge, MA: Belknap Press of Harvard University Press, 1978), pp. 414–15; Morton D. Paley, *The Apocalyptic Sublime* (New Haven: Yale University Press, 1986), pp. 186–90.

Fig. 2: George Hoadley and Anthony Oldfield after John Martin, *Belshazzar's Feast*, *c.* 1828, vitreous paints, stains, and enamels on crown glass, 48.3 × 72.4 cm, private collection, Syon House, Brentwood, Middlesex. © Collection of the Duke of Northumberland.

Tate Britain curators Martin Myrone and Anna Austen explore the duality in Martin's large-scale oil paintings between the 'visual techniques of popular entertainment' and fine art traditions. Martin's 'artificial illumination and strong colour effects', and the singular use of 'chemical' and 'domineering' reds and oranges in particular, are placed within the former category and loosely attributed to his working-class background in what is regarded as an industrial art form.[3] Such detached and misconceived allusion to glass painting derives from and is typical of interdisciplinary writing on 'pre-cinema' and the history of the transparent screen, 'the transparency', within popular entertainment.[4] As a counterbalance, this article views the glass painting of *Belshazzar's Feast* with more specialist eyes and insists on a revision of its aesthetic significance.

[3] Martin Myrone, 'John Martin: Art, Taste and the Spectacle of Culture', in *John Martin*, ed. by Myrone, pp. 11–21 (pp. 13–14, 18); Myrone and Austen, pp. 68, 104.
[4] Mikhail Yampolsky, 'Transparency Painting: From Myth to Theater', in *Tekstura: Russian Essays on Visual Culture*, ed. and trans. by Alla Efimova and Lev Manovich (Chicago: University of Chicago Press, 1993), pp. 127–51. See also, John Plunkett, 'Optical Recreations, Transparencies, and the Invention of the Screen', *Visual Delights — Two: Exhibition and Reception*, ed. by Vanessa Toulmin and Simon Popple (Eastleigh: Libbey, 2005), pp. 175–93 (pp. 176–79).

A Georgian glass painting is a fundamentally different thing to a Victorian stained glass window and was concerned more with expanding the aesthetic limitations of easel painting than with the revival of medieval tradition. The former is a painting executed in fully and semi-transparent vitreous paints, stains, and enamels — the 'enamel method' — on the surface of a single piece of colourless glass, whereas the latter is essentially a mosaic of different coloured glasses held together by lead. The mid-nineteenth century reclaimed the art of glass painting for the decorative arts and the filling of windows in Gothic Revival churches. Principles for the design and execution of stained glass windows were formulated.[5] As a stained glass window should function as a translucent continuation of the wall into which it was set, it should read as a two-dimensional flat surface and any attempt at pictorial naturalism was deemed to 'pierce the building with holes' and disrupt the architectural unity.[6] Surface painting, therefore, was reduced to the drawing of outline detail and minimal tonal modelling. To allow for a traditional mosaic approach, the glass industry experimented with a return to the production of sheets of 'pot-metal' glasses where colouring agents were added to the glass or 'metal' while in a molten state in the furnace. Key to this was the rediscovery of how to make the ruby red glasses seen in medieval stained glass windows.[7] These contrasting aesthetic approaches, enamel versus mosaic, converged in the Stained Glass Gallery at the Great Exhibition of 1851 and Jasmine Allen's analysis of the critical response illustrates how illusionistic pictorial glass painting typical of the Georgian period was dragged into debates surrounding the material truthfulness of medieval practice and ceased to be judged on its own terms.[8]

Although they note that Martin himself experimented with painting versions of his major works on glass, Myrone and Austen do not engage with how this contradicts their placement of glass painting as a trivial art form.[9] The surviving glass painting was not executed by Martin but, briefly in 1828, it may have been exhibited together with the original oil painting. This article compares the original oil painting and the glass painting directly for the first time in order to identify any potential aesthetic gain regarding illumination and colour.[10] It explores how the viewer originally experienced the glass painting and relocates it within the contemporary

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[5] The clearest voice was Francis Wilson Oliphant (1818–1859) in *A Plea for Painted Glass: Being an Inquiry into its Nature, Character, and Objects, and its Claims as an Art* (Oxford: Parker, 1855).

[6] Francis Wilson Oliphant, 'On the Principles of Glass Painting', *Builder*, 31 July 1852, pp. 483–84 (p. 483).

[7] Sally Rush-Bambrough, 'Glass Painting in Scotland, 1830–70' (unpublished doctoral thesis, University of Glasgow, 2001), pp. 16–29.

[8] Jasmine Allen, 'Stained Glass and the Culture of the Spectacle, 1780–1862', *Visual Culture in Britain*, 13 (2012), 1–23 (pp. 11–14).

[9] Myrone and Austen, p. 107, n. 31; Balston, pp. 30–31.

[10] Some details are compared by Paley (p. 189).

interface of science and art where optically assisted viewing and the harnessing of real light formed part of serious aesthetic experiment. A small number of lost glass paintings after works by Martin are known. Within this article, the narrative moves to Edinburgh and uses the story of the exhibition of a glass painting after Martin's *Fall of Babylon* by William Cooper (1804–1864) to engage with primary sources explaining the significant material and technical challenges the Georgian glass painter had to overcome. These challenges alone evidence a seriousness of aesthetic experimentation. Attention is drawn to the place of prints within the copying process and the glass paintings are aligned to Martin's own mezzotint versions of his oil paintings.

The *Fall of Babylon* and *Belshazzar's Feast*

The *Fall of Babylon* (1819) was the second of Martin's 'blockbuster paintings' depicting catastrophic events (Myrone and Austen, pp. 93–121). It was exhibited at the British Institution in London before being purchased by the banker Philip Hope for 400 guineas and forming part of the Hope family collection at Deepdene in Surrey.[11] Martin borrowed it back for a solo exhibition at the Egyptian Hall, Piccadilly in 1822.[12] Although completed a year later, *Belshazzar's Feast* is the narrative prequel to the *Fall of Babylon*. These two paintings conjure the vastness of the lost ancient city of Babylon while the biblical story of the downfall of the Babylonian empire is told in epic detail. *Belshazzar's Feast* was exhibited at the British Institution in early 1821 and immediately awoke a deep interest among the middle classes whose mental picture of biblical catastrophe had been shaped by their reading of John Milton's *Paradise Lost* (Myrone, 'John Martin', pp. 11, 14). Notably, the London glass merchant William Collins bought it for 800 guineas as a business venture and recovered his investment with profit by exhibiting *Belshazzar's Feast* in rented spaces, first in London at 343 Strand and then across the country until 1833 when it disappears from view.[13]

The glass paintings of *Belshazzar's Feast*

The first specific mention of a glass painting is in 1828 when 'a Cabinet Picture of BELSHAZZAR'S FEAST, enamelled on glass' was exhibited

[11] 'Fine Arts: British Institution', *Examiner*, 7 February 1819, pp. 92–93; 'Fine Arts', *Examiner*, 11 April 1819, pp. 238–39 (p. 239); Myrone and Austen, pp. 97–98; J. S. Bright, *A History of Dorking and the Neighbouring Parishes* (Dorking: Clark; London: Simpkin, Marshall, 1884), p. 125.
[12] 'Egyptian Hall', *Morning Post*, 8 April 1822, p. 1.
[13] 'Fine Arts', *Literary Gazette*, 10 March 1821, p. 153; 'Belshazzar's Feast', *Examiner*, 17 June 1821, p. 384; Myrone and Austen, pp. 101–05.

by Collins in rented rooms at 287 Strand.[14] Collins traded in ornamental vessel glass and glass lanterns at 227 Strand but expanded his catalogue to include glass paintings and address the growing demand for religious windows.[15] The *Spectator* suggests that the glass painting was exhibited in 'Mr COLLINS's gallery' together with the original oil painting before it was quickly purchased by the Duke of Northumberland and set up in the Tapestry Gallery at Northumberland House as a 'magnificent' contribution to an evening of cultural entertainment held on 7 May and attended by George IV.[16] A feature on stained glass in the first issue of the *Civil Engineer and Architect's Journal* (1837–38) attributes its execution to Hoadley and Oldfield, of 6 St James's Place, Hampstead Road, who also made a second version which they exhibited on their own behalf in April 1832, along with one after Martin's *Joshua Commanding the Sun to Stand Still upon Gibeon*, at 357 Strand and sold to an American.[17] Both Martin and Hoadley had worked with Charles Muss (1779–1824), an enamel painter on copper, ceramic, and glass, before he went bankrupt and all three were recruited by Collins. Although he was never apprenticed to the trade, Martin worked for Collins as a glass painter from 1809 to 1812.[18] When Hoadley went into partnership with Oldfield is unclear but presumably he remained in Collins's employment for a time after Martin left and persevered with his former colleague's experiments. As Martin had a high opinion of Hoadley and Oldfield's abilities, he may have authorized their versions of his works.[19]

The early biography of Martin by Richard and Samuel Redgrave is the origin of misinformation regarding the first version of *Belshazzar's Feast* on glass. It is also illustrative of how quickly Georgian glass painting became associated with the illusionistic use of transparent media within popular entertainment.[20] Writing in 1866, the Redgraves conclude their mixed appraisal of the oil painting of *Belshazzar's Feast* with the derogatory statement that

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[14] 'An Exhibition of the Large Calcutta Window', *Examiner*, 10 February 1828, p. 94.
[15] 'Their Majesties …', *Morning Post*, 4 December 1830, p. 3.
[16] 'Painted Glass', *Spectato*r, 14 February 1829, p. 105; 'Duchess of Northumberland's Grand Concert', *Morning Post*, 9 May 1828, p. 3.
[17] Philotechnicos, 'No. 3: Stained Glass', *Civil Engineer and Architect's Journal*, 1 (1837–38), 155–56 (p. 156); 'Exhibition of Paintings in Enamel Colours on Glass', *Examiner*, 1 April 1832, p. 224.
[18] 'Glass Painters 1750–1850, Part 2: Hoadley, George and Oldfield, Antony; Martin, John; and Muss, Charles', *Journal of the British Society of Master Glass Painters*, 13 (1960–61), 394, 401, 403–04; John Martin, letter to the editor, *Illustrated London News*, 17 March 1849, pp. 176–77 (p. 176); George Godwin, Jun., 'On the Present State of the Art of Glass Painting in England and France, and on the Necessity for Efforts in its Favour', *Civil Engineer and Architect's Journal*, 3 (1840), 217–18.
[19] John Martin, 17 August 1835, HC Select Committee on Arts and their Connexion with Manufactures (HC Paper (1836) no. 568), pp. 69–73 (pp. 72, 73).
[20] For a comprehensive review of the place of glass painting and the stained glass window within the nineteenth-century culture of spectacle, see Allen.

> Martin, who was still connected with glass painting, repeated the subject on a sheet of plate-glass. This was shown in the Strand, inserted in a wall, so that the light was really transmitted through the terrible handwriting; the effect was startling, but it was surely allied more to the diorama than to fine art. (II, 429)

Thomas Balston, with reference to the Redgraves, then asserts that Martin made this version as a novelty to 'draw attention' to the exhibition of the oil painting at 343 Strand in the summer of 1821 (not 1828).[21] Peter Binnall adds a further flourish by placing it in the street window of Collins's premises: it was 'exhibited as a coloured transparency with a light behind the writing on the wall, in the window of his premises in the Strand'.[22] As the story has a certain frisson to it, it has persisted.[23]

Returning to the original notices for the exhibition of the glass paintings: they were presented as 'cabinet pictures', meaning that they were small-scale versions of celebrated works of art hopefully destined for elite private collections. These notices generally appear in the 'Fine Arts' rather than the popular entertainment sections of the newspapers concerned. It is no accident that the version of *Belshazzar's Feast* purchased by the Duke of Northumberland, described as a '*ne plus ultra* of art', was eventually displayed in one of the windows of the Oak Corridor at Syon House, Brentford, Middlesex which served as a gallery for royal portraits and small-scale works by Dutch and Flemish painters.[24]

Experiments with the sublime

Morton Paley considers *Belshazzar's Feast* to be the perfect example of the Burkean sublime in its synthesis of infinite vastness, dark obscurity, and blinding light.[25] The *Description* issued by Collins as a guide to viewing *Belshazzar's Feast* explains that perspective and light working together constitute the 'intellectual mechanism' of the painting.[26] As the figures are too

[21] Balston, p. 58. Balston transcribes 'diorama' as 'drama'.
[22] Peter Binnall, 'The East Window of Redbourne Church, Lincolnshire', *Journal of the British Society of Master Glass Painters*, 13 (1960–61), 408–10 (p. 408).
[23] Most recently, Myrone and Austen, p. 106.
[24] Philotechnicos, p. 156; *Syon House: The Story of a Great House with a Short Guide for Visitors* (London: Aldprint for Syon House Estate, 1950), p. 46; Balston, p. 58.
[25] Paley, pp. 132–33; Edmund Burke, *Philosophical Enquiry into the Origin of Our Ideas of the Sublime and the Beautiful* (London: Dodsley, 1757).
[26] *A Description of the picture Belshazzar's Feast painted by Mr J. Martin which last year gained the highest premium at the British Institution in London and now exhibiting at the Hall of the Carlton Company, Waterloo Bridge, Edinburgh, 21st edition 'printed for the proprietor of the picture'* (London: [n. pub.], 1822), pp. 5–15. This was based upon Martin's original catalogue: see Michael Campbell, 'John Martin as a Commercial Printmaker', in *John Martin*, ed. by Myrone, pp. 23–33 (p. 29).

numerous and diminutive, the narrative does not primarily unfold, as in conventional history painting, through figure composition, gesture, and facial expression. On account of this substitution, the *Westminster Review* accused Martin of pyrotechnic show without substance: he 'addresses the eye only; and by producing a strong sensation, deludes the spectator into the notion that he is affected by the moral of the event'.[27] This stimulation of audience response through the eye rather than engagement with the mind, of emotion overriding reason, has continued to encourage the location of Martin's 'blockbuster paintings' on the borderline between fine art and popular entertainment. In advance of the Tate Britain exhibition, Ann Bermingham suggested that they demonstrate a duality between the 'historical landscape', where the historical figure is subordinate in scale to the landscape, and the spectacular 'dramatic manipulations of perspective' of the panorama and 'the luminous effects' of the diorama.[28]

Epic scale

Martin's epic representation of *Belshazzar's Feast* was developed from the biblical story of the Fall of Babylon. Belshazzar, named as king of Babylon, summoned one thousand of his lords to celebrate a day of festival, along with his wives and concubines. He called for the Jewish sacred vessels stolen from the Temple of Jerusalem by his father Nebuchadnezzar to be brought and used to drink in honour of Babylon's pagan idols. In response to this sacrilege, a divine hand wrote words of warning on the palace wall — *Mene, Mene, Tekel, Upharsin* — which the Babylonian sages failed to interpret. Belshazzar's mother Nitocris advised him to consult the Jewish captive Daniel who read the writing as saying that God had numbered the days of the Babylonian empire, that Belshazzar's virtue had been weighed and found wanting, and that his kingdom would be divided between the Medes (under Darius) and the Persians led by Cyrus the Great.[29]

In both *Belshazzar's Feast* and the *Fall of Babylon*, Martin's illusion of the lost city of Babylon is based upon the literary descriptions of its wonders in ancient Greek texts as well as the biblical book of Genesis.

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[27] Review of John Martin, *Illustrations of the Bible*, Parts I–VI, *Westminster Review*, April 1834, pp. 452–65 (p. 455).

[28] Ann Bermingham, 'Landscape-o-Rama: The Exhibition Landscape at Somerset House and the Rise of Popular Landscape Entertainments', in *Art on the Line: The Royal Academy Exhibitions at Somerset House, 1780–1836*, ed. by David H. Solkin (New Haven: Yale University Press, 2001), pp. 127–43 (pp. 136, 138).

[29] This is a summary of Daniel 5. Historically, Belshazzar was the son of Nabonidus and only acted as regent while his father was absent in Arabia. It was Nabonidus (556–536 BC) who faced the Persian conquest. See Michael Seymour, 'Belshazzar's Feast and the Fall of Babylon: Representations in Art', in *Babylon: Myth and Reality*, ed. by Irving Finkel and Michael Seymour (London: British Museum Press, 2009), pp. 173–78 (p. 173).

While the classical sources may have exaggerated the scale of the city and its buildings, it suited Martin's purposes to trade in the vast and he mapped them with mathematical precision.[30] Charles Lamb wrote in 1833 that in his imagining of the lost city, Martin's vision was 'of the highest order of the material sublime'.[31] While in *Belshazzar's Feast* the city rises above an atrium within the palace of Nebuchadnezzar, and the *Fall of Babylon* presents an urban panorama seen from the Hanging Gardens, the scale of the city and its buildings is equally tangible in both. The *Descriptive Catalogue* for the engraving of the *Fall of Babylon* informs the viewer that, by means of relative scale, the eye can correctly measure the palace of Nebuchadnezzar as eight miles and the palace of Semiramis on the other side of the Euphrates as four miles in circumference (p. 1). The highest structures, the Temple of Belus as described by Herodotus (*Histories*, 1. 181–82) and the biblical Tower of Babel (Genesis 11. 1–9) disappear into the clouds.

Magnifying lenses

The Redgraves recollected that *Belshazzar's Feast* was 'set into a wall' and backlit.[32] In addition, a review of Hoadley and Oldfield's 1832 exhibition at 357 Strand noted that the glass paintings of *Belshazzar's Feast* and other subjects after Martin were viewed through powerful magnifying lenses.[33] Five years later, in March 1837, they exhibited *Joshua*, and new glass paintings of the *Fall of Nineveh* after Martin and the *Opening of the Sixth Seal* after Francis Danby at 209 Regent Street, which likewise were viewed with the assistance of 'great magnifying power'.[34] Together, these references confirm that, at least when exhibited to the public before sale, these versions were set within a box behind a partition wall, backlit, and viewed through an aperture fitted with a magnifying lens. So, beyond issues of scale, the viewing of the glass paintings and the original oil paintings were fundamentally different experiences. The glass painting within a viewing box had a place within what Jonathan Crary terms 'the reorganisation of the observer' that required 'modulation between eye and optical apparatus': the observer no longer actively identified their own 'point of view' before the object but was placed adjacent and immobile before a lens.[35] As vision was isolated

[30] John Martin, *Descriptive Catalogue of the Engraving of the Fall of Babylon* (London: [n. pub.], 1832), p. 2; Michael Seymour, 'Babylon's Wonders of the World: Classical Accounts', in *Babylon: Myth and Reality*, ed. by Finkel and Seymour, pp. 104–09.
[31] Charles Lamb, 'Barrenness of the Imaginative Faculty in the Productions of Modern Art', *Last Essays of Elia* (London: Moxon, 1833), pp. 166–86 (p. 171).
[32] The *Spectator* also confirmed that 'a strong light from behind' was employed ('Painted Glass', 14 February 1829, p. 105).
[33] 'Enamel Pictures on Glass', *Morning Post*, 24 April 1832, p. 3.
[34] 'Paintings on Glass', *Morning Post*, 27 March 1837, p. 3.
[35] Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1990), pp. 2, 14, 129–31.

from the other senses, arguably in the case of the glass paintings after Martin, viewer immersion allowed the imagination to lose itself in magnified vastness and obscurity.

The viewing box was an optical tool to assist the eye, offering a privileged and private tour of Martin's Babylon, far removed from crowded exhibition rooms. Through the intervention of a magnifying lens, the eye was rewarded with a heightened illusion of tangible objects located within deep perspectival space. Hoadley and Oldfield's 1837 exhibition took place 'in the same house', 209 Regent Street, as the London Cosmorama. This specialized in virtual travel and the small-scale perspective views produced for the ever-changing exhibitions were notoriously crude. Most were illuminated from the front but transparent images with special effects were known.[36] It is the viewing apparatus employed at the Cosmorama, however, that is of interest here:

> A handsome room [...] is provided with what appear to be small windows, consisting of three panes each, arranged horizontally side by side; [...] through any pane of these windows, the spectator views with both eyes [...]. The glass through which the spectator views [...] is a convex lens, the focus of which is somewhat more than the distance of the centre of the picture, so as that every point of it may be seen with distinctness. The distance is from 6 to 9 feet [...]. Blinds above, below, and on either side, bound the view, and prevent the borders of the picture being seen.[37]

The lens deceived the eyes into reading a near object, the flat picture plane, as a larger distant object in real space by 'converting the divergence of the rays of light into the parallelism which belongs to the supposed remoteness of the objects'.[38] Because the object was between the magnifying lens and its distant focal point, the viewer saw a magnified virtual image. This was replicated in the home by an 'optique' or diagonal mirror where a large double convex lens was mounted on a stand with a mirror hinged at a diagonal behind it in order to reflect a perspective print lying perfectly flat on the table beneath. As C. J. Kaldenbach explains, 'the important function of the lens in the optical machine is not its magnification but its creation of an illusion of depth in binocular vision.'[39] For Stephen Pinson, such

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[36] T. J. A., 'Fine Arts: The Cosmorama', *Literary Chronicle and Weekly Review*, 26 October 1822, pp. 683–84; 'Fine Arts: Cosmorama, Regent Street', *New Monthly Magazine and Literary Journal*, February 1831, p. 72.

[37] Charles Blunt, 'Popular Description of the Cosmorama', *La Belle Assemblée*, November 1821, p. 233.

[38] Dr Neil Arnott, *Elements of Physics, or Natural Philosophy*, 2 vols (London: Longman, Rees, Orme, Brown, and Green, 1829), II, 275.

[39] C. J. Kaldenbach, 'Perspective Views', *Print Quarterly*, 2 (1985), 87–104 (p. 87).

lens-assisted viewing was a heightened form of 'optical naturalism' where the two-dimensional image was 'redrawn in relief' and its edges dissolved and expanded into an illusion of actual space through which the viewer travelled while remaining fixed to the spot.[40]

Because it is perceived as a trade and associated with the industrial-scale production of stained glass windows later in the nineteenth century, Georgian glass painting is vulnerable to art historical prejudice (Allen, p. 11). Tate Britain mounted an exhibition on the work of Thomas Gainsborough (1727–1788) in 2002–03, also curated by Myrone, and this included his 'showbox', the optical tool he began using *c.* 1781–82 as a means of studying effects of light in landscape painting. Gainsborough executed landscape studies in regular oil paint on glass slides, placed these within an enclosed wooden box, and viewed them with the assistance of an adjustable magnifying lens and candles. Myrone's assessment of the art historical significance of this is that

> the essentially private nature of the viewer's experience is critical. It is a magnifying device, with the moveable lens enlarging the image, but also making it appear more distinct. Combined with the effects of the candles [...] it thus intensifies the viewer's perception of the painted landscape. [...] This concern with the precise quality of the aesthetic experience [...] is a reminder of his seriousness of purpose as an artist.[41]

While Gainsborough was concerned with recreating the effects of natural light and Martin with imagining supernatural lighting events, the glass painting of *Belshazzar's Feast* viewed through a magnifying lens was also, arguably, more about visual perception and aesthetic experience than mere entertainment.

The 'full-scale of nature as to light and shadow'

The *Spectator* suggested that Collins exhibited the glass painting and the original oil painting of *Belshazzar's Feast* together so that Martin's characteristic 'strong contrasts of light and shade' could be appreciated in an 'extraordinary light' ('Painted Glass', p. 105). Martin's evidence to the

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[40] Stephen Pinson, *Speculating Daguerre: Art and Enterprise in the Work of L. J. M. Daguerre* (Chicago: University of Chicago Press, 2012), pp. 61, 75, 82–83.

[41] *Gainsborough*, ed. by Michael Rosenthal and Martin Myrone (London: Tate Publishing, 2002), p. 256. See also, Ann Bermingham, 'Gainsborough's *Cottage Door*: Sensation and Sensibility' and William Vaughan, 'Magic in the Studio', both in *Sensation and Sensibility: Viewing Gainsborough's 'Cottage Door'*, ed. by Ann Bermingham (New Haven: Yale University Press, 2005), pp. 1–34 (pp. 23–25); pp. 165–79 (pp. 173–76).

Select Committee on Arts and their Connexion with Manufactures (1835) documents his thoughts on the comparative virtues of glass painting:

> Glass-painting must have surpassed all other branches of art in splendour, as it is capable of producing the most splendid effects, far superior to oil-painting or water-colours, for by the transparency we have the means of bringing in real light, and have the full-scale of nature as to light and shadow, as well as to the richness of colour, which we have not in oil-painting nor in water-colour. (HC Paper no. 568, p. 72)

This statement links glass painting not to the transparent screen of popular entertainment but rather to traditions of optical naturalism, pictorial composition using contrasting tonal effects of light and dark, that reach back to the Renaissance.[42] In Martin's imagining of the biblical story of *Belshazzar's Feast*, divine judgement is conceived as a force of light equivalent to lightning and the catastrophe begins with a lighting event:

> The characters in strokes of the most intense light, send forth an indescribable effulgence, such as would be in the blaze of lightnings, could they be fixed on the angry clouds from which they emanate — their scintillating beams fill the whole of the Atrium with awful resplendency, and the whole assembly with horror and distress. Like arrows of flame they dart across the hall, and as a shower of fire, alight upon every object. (*A Description*, pp. 9–10)

Lamb argued that Martin's overly descriptive play of light presented a material reality that a mind overpowered by the horror of divine judgement would have been blind to. When imagining a scene of divine judgement, he was forced to conclude that 'not all that is optically possible to be seen, is to be shown in every picture' (p. 176). The glass painting, however, 'by the transparency' takes Martin's optical naturalism to another level. When the Redgraves referred to the startling effect of the glass painting as being like a diorama, they meant that the illusion of effulgence was made palpable: real light was used to tell a story of the agency of light. The *Description* explains how the story unfolds in time and space but also as a 'perspective of light' (p. 11): the divine judgement impacts in the bright foreground with the key victims relieved by light, especially the women dressed in white, while the guests in the more distant and darker spaces are oblivious to it.

[42] See David Summers, *The Judgment of Sense: Renaissance Naturalism and the Rise of Aesthetics* (Cambridge: Cambridge University Press, 1987), pp. 15–16, 174–76.

Hoadley and Oldfield's *Belshazzar's Feast* is executed in vitreous glass paints, stains, and enamels, the colours being developed and fixed by firing in a kiln.[43] In Cooper's own words:

> All the colours employed in glass painting and staining are oxides of metals or minerals, as gold, silver, cobalt, which not only stand the fire, but require the powerful interference of that agent to bring out their brilliance and transparency. Some colours, with the application of heat, penetrate the body of the glass, and, from this circumstance, are called stains; while others, being mixed with a vitreous substance called flux, become fused or vitrified on the surface. The former produces a variety of colours, and all of them perfectly transparent. The produce of the latter are only semi-transparent, but they may be made to yield any colour or tint required.[44]

In the glass painting, light transmitted through white glass, bright yellow stain, and brilliant purple and lilac enamels optically throws the key victims forward. Through the sequenced application of fully and semi-transparent vitreous paints, stains, and enamels, every column, object, and fold of cloth is fully modelled in light and shadow. Translucent colour modulated by an overlay of semi-opaque tonal effects deceive the eye into seeing reflected rather than transmitted light: the viewer believes they are looking at the 'scintillating beams' mirrored by porphyry, precious metal, and silk. Whereas in the oil painting the depth of the palace (one mile) is suggested through the comparative scale of the distant figures to the architecture (*A Description*, p. 4), in the glass painting the gilded statues of Jupiter Belus lined up one behind the other and the flames of the numerous oil lamps on the banqueting tables lead the eye towards the distant vanishing point. Altogether, arguably, the intellectual mechanism of the composition 'by which shadows opposed to lights and groups contrasting each other' is more successful in the glass painting (p. 5). A review in the *Morning Post* recommended that artists seek out the glass painting praising the synthesis of subject, medium, and optics:

> The supernatural effect intended is highly aided by the transparent nature of the material [...]. The effect is heightened to a degree not attainable by any other branch of painting, and so correct is the general execution as to amount, when viewed through the medium of a powerful magnifier, almost to perfect and beautiful illusion.[45]

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[43] Myrone and Austen catalogue it as being executed in oil paint on glass as if it is the exact equivalent of the slides in Gainsborough's showbox which were executed by a cold process in regular oil paint and therefore not as brilliant and transparent (p. 99).
[44] William Cooper, *The Crown Glass Cutter and Glazier's Manual* (Edinburgh: Oliver & Boyd; London: Simpkin, Marshall, 1835), p. 104.
[45] 'Enamel Pictures on Glass', *Morning Post*, 24 April 1832, p. 3.

The Diorama

Negative comparison of the glass painting of *Belshazzar's Feast* with a commercial diorama is misleading. Martin himself was appalled that his name should be associated with a plagiarized version shown at 'a sort of diorama' in Oxford Street which he considered 'a most infamous piece of painting'.[46] This would have been a very different thing to the paintings by Louis-Jacques-Mandé Daguerre (1787–1851) and Charles-Marie Bouton (1781–1853) shown at the original Diorama (1822 Paris; 1823 London), an ambitious artistic enterprise founded and directed by themselves (Pinson, p. 31). Pinson draws attention to Daguerre's sequential exhibition at the Paris Salon and Diorama in 1823 and 1824 of conventionally painted and 'fixed', as opposed to partly translucent (dioramic) and seemingly moving versions of the same subject, *Holyrood Chapel by Moonlight* and *Rosslyn Chapel*. The intention must have been to invite direct comparison and show what real light and optics could add to the viewing experience (Pinson, pp. 53–55). The Diorama was a 'life-size viewing box' which, in order to allow for collective viewing, worked in reverse to the 'optique' or Cosmorama: the illusion of depth was achieved by enlarging the image and setting it at the distant end of a long tunnel (Arnott, II, 278–79). It was also a laboratory for Daguerre as an 'amateur scientist, or inventor, of the arts' to study and experiment with the way translucent and opaque colours responded to different lighting conditions (Pinson, pp. 54, 69, 70, 82–85). A translucent canvas was painted with both transparent and opaque paints and then, using a complex semi-mechanical system of windows, skylights, shutters, and coloured screens, natural and coloured light was both transmitted through and reflected off the canvas. While the Diorama imitated the changing light effects seen in nature and the glass painting was a 'fixed' effect image, what they shared was the use of real light as a secondary palette. In both, transmitted light was used to create an illusion of light being reflected off surfaces and give transparency, and so depth, to shadows (Pinson, pp. 65, 79–82).

William Cooper and the *Fall of Babylon*

This revisiting of the glass painting after Martin's *Belshazzar's Feast* began with the discovery that a glass painting after his *Fall of Babylon* was exhibited in Edinburgh. On 23 September 1833 the *Caledonian Mercury* reported that the current exhibitions of fine arts in Edinburgh included one of glass paintings to be seen at 14 Elm Row, the premises of the glass merchant William

[46] Martin described it as 'a most infamous piece of painting' (HC Paper no. 568, p. 73).

Cooper. The sensation was the *Fall of Babylon*, after Martin, admired for its 'gorgeous display and richness of colouring'. This too was viewed through a 'cosmoramic' lens and could be seen at different locations in the city for the next five years.[47] Cooper started trading in Edinburgh around 1825 or 1826 and was appointed Crown Glass Cutter, Glazier and Stained Glass Maker in Ordinary to the King for Scotland (William IV) in 1834, with other royal appointments following.[48] In 1837 he patented a process for copying pictures and ornamental designs on to glass and his reward was admission as an ordinary member to the Society for the Encouragement of the Useful Arts in Scotland, founded in 1821 by the physicist and natural philosopher Sir David Brewster (1781–1868) as a forum for those invested in invention and enterprise.[49] This became the Royal Scottish Society of Arts in 1841. Despite its promotion, the *Fall of Babylon* remained unsold and when Cooper's business failed in 1841 it was listed among his financial assets at £7, a fraction of its true value.[50]

Mezzotint and glass painting

The glass painting after Martin's *Belshazzar's Feast* has so far been judged to be an empty copy of the original oil painting with no significant contribution from the glass painter. This assessment can be revised, however, if it is seen as the equivalent of Martin's own creative reworking of his compositions in print form. It is no coincidence that the Hoadley and Oldfield glass paintings of *Belshazzar's Feast* post-date Martin's issue of a large-scale print version (mezzotint with etching) in June 1826 (*Fig. 3*).[51] A large-scale print version (mezzotint with etching) of the *Fall of Babylon* was issued in October 1831 (*Fig. 4*) (Campbell, 'John Martin as Commercial

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[47] 'Stained Glass', *Caledonian Mercury*, 23 September 1833, p. 3. Cooper also exhibited the *Fall of Babylon* at the Straiton Gallery in Wemyss Place, showrooms at 4 Princes Street, and his new premises at 18 Picardy Place. See 'Glass Staining', *Caledonian Mercury*, 24 April 1834, p. 2; and 'Stained & Enammelled Glass', *Caledonian Mercury*, 21 December 1837, p. 1.

[48] Appointments from 1830 to 1837, p. 112, London, Public Records Office, Chancery Lane, LC3/70; Tradesmans' Appointments August 1837 to October 1840, p. 213, LC5/243. No details of these appointments are given.

[49] William Cooper, 'An Improved Method of Executing Ornaments, Devices, Colours or Stains on Glass', Patent No. 7270 (10 January 1837); 'Proceedings of the Society for the Encouragement of the Useful Arts for Scotland', *Edinburgh New Philosophical Journal*, 24 (1837–38), 210–21 (p. 216).

[50] 'I. Shop Furniture & Stock in Trade, Shew Room Flat', *State of the Affairs of Wm Cooper & Co. Stained Glass Manufacturers Edin.r* (11 June 1841), Edinburgh, National Archives of Scotland, CS 279/530.

[51] Campbell, 'John Martin as Commercial Printmaker', p. 27; 'The Print of Belshazzar's Feast', *Morning Post*, 13 June 1826, p. 3.

Fig. 3: John Martin, *Belshazzar's Feast*, 1826, mezzotint with etching, 54.4 × 74.2 cm. © Trustees of the British Museum.

Fig. 4: John Martin, *The Fall of Babylon*, 1831, mezzotint with etching, 46.4 × 71.9 cm. © Trustees of the British Museum.

Printmaker', p. 29). The working process for the mezzotints and the glass paintings may have been similar. Michael Campbell suggests that an enlarged version of the outline etching Martin produced to function as a

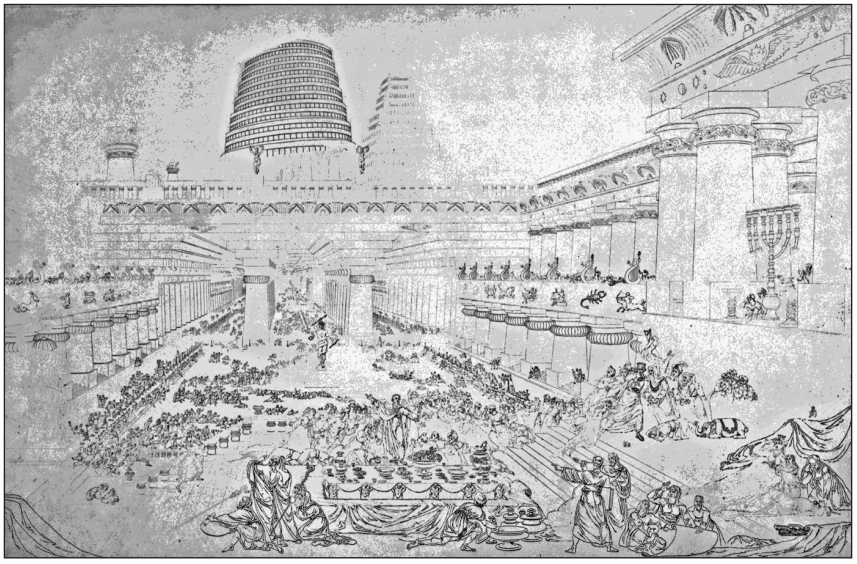

Fig. 5: John Martin, *Belshazzar's Feast*, 1826, etching, 49.7 × 73.5 cm. © Trustees of the British Museum.

key in the *Description* of *Belshazzar's Feast* was used as an 'underlying guide' for the mezzotint (*Fig. 5*) ('John Martin as Commercial Printmaker', p. 24). Martin mapped the architectural perspectives and placed the figure groups in the first-stage outline etching and then added the tonal and lighting effects in mezzotint.[52] The enlarged outline etching and mezzotint in the British Museum roughly approximate in size to the glass painting, being 49.7 × 73.5 cm and 54.4 × 74.2 cm respectively, while the glass painting is 48.3 × 72.4 cm.[53] Martin's *Descriptive Catalogue* for the mezzotint of the *Fall of Babylon* includes an outline etching as a key. The dimensions of Cooper's glass painting are given as 18 × 26 in. (45.7 × 66.0 cm) and the mezzotint in the British Museum is 46.4 × 71.9 cm.[54]

Cooper's description of his patent copying process notes that he used an eidograph, an advanced form of pantograph recently (1821) invented in Edinburgh by Professor William Wallace:

> By means of the pantographer, devices in line work of any kind, however varied, may be easily transferred from any original drawing or engraving and etched on coated glass with great accuracy [...]. The same may be said of etching the lines of portraits, prints and pictures. (Patent No. 7270, pp. 4–5)

[52] Michael Campbell, *John Martin, Visionary Printmaker* (York: Campbell Fine Art in association with York City Art Gallery, 1992), p. 33.
[53] British Museum, 1888,0716.302, Mm, 10.1.
[54] *Caledonian Mercury*, 24 April 1834, p. 2; British Museum, Mm, 10.6.

So, he could have traced an enlarged version of the key printed in the *Descriptive Catalogue* onto a sheet of glass prepared with a vitreous coating.[55] Alternatively, as the glass painting of the *Fall of Babylon* was approximately the same size as the mezzotint, he may simply have placed either this, or an enlarged outline tracing on paper, under a sheet of glass and traced the composition by hand on the surface. Although he is somewhat confused as to the processes involved, Philotechnicos's description of Hoadley and Oldfield's working practice suggests they began by tracing Martin's compositions either onto or through a neutral tinted ground applied to the surface of a sheet of glass (p. 156).

Mechanical copying or tracing was, however, only the starting point for the actively inventive mezzotint and glass painting processes. Mezzotint allowed Martin to modulate the effects of light and tone on the metal plate itself with 'all the spirit and finish of the painter's touch'.[56] He was perhaps predisposed to the possibilities of mezzotint as a vehicle for reworking his compositions because of his experience as a glass painter. Mezzotint and glass painting are similar in that they both allow for soft and subtle gradations of tone and deep velvety blacks relieved with clear highlights: 'the full scale of nature as to light and shadow'. In both, the artist works from black to white with the paper or glass key to the tonal effects. With mezzotint,

> the process involves indenting the metal printing plate by rocking a toothed metal tool across the surface. Each pit holds ink, and if printed at this stage the image would be solid black. However the printmaker creates dark and light tones by gradually rubbing down or burnishing the rough surface to various degrees of smoothness to reduce the ink-holding capacity of areas of the plate.[57]

The glass painter applies black/brown opaque vitreous glass paint to the surface of a piece of glass and this can be partially lifted while wet using stippling brushes or scratched off when dry. Highlights are created when areas of the glass are left clear. It is a process of continuous modulation of light and dark.

Martin's mezzotint of the *Fall of Babylon* narrows the panoramic view of the oil painting and thrusts the assassination of Belshazzar into the foreground (Campbell, 'John Martin as Commercial Printmaker', pp. 131–32). A 'perspective of light' is again at work with the 'effulgence' from a blaze

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[55] Cooper's patent process was for etching monochrome designs in clear glass through a vitreous coating which fired to form an opaque white surface.
[56] Review of *Milton's Paradise Lost*, illustrated by John Martin, *Literary Chronicle and Weekly Review*, 9 April 1825, p. 237.
[57] 'Mezzotint', <https://www.tate.org.uk/art/art-terms/m/mezzotint> [accessed 2 April 2020].

of lightnings creating a corridor of light along the river and revealing the clash of the Babylonian and Persian armies. Their beams alight upon every tower in the city, cast reflections in the water, and outline the trees in the Hanging Gardens in dramatic silhouette. Most importantly, the luminous vortex of clouds from which the lightnings emerge becomes 'the point at which the natural, catastrophic and apocalyptic sublimes meet' (Paley, p. 138).

Chemical reds

Red was the only cheerful colour Burke considered productive of the sublime (p. 149). Isobel Armstrong writes of 'passional' colour within Romantic painting and asserts, alluding to the obsession with Vesuvius as an active volcano, that 'it is red that dominates this century' which was 'seeking the apotheosis of redness, an eruption of colour'.[58] Meanwhile, Myrone and Austen struggle to understand what they are seeing in Martin's use of scarlet reds but repeatedly offer his 'background in glass painting' as the explanation for 'artificial illumination', 'strange luminescence', and 'strong colour effects'. The strange fiery red light that suffuses the oil painting of *Belshazzar's Feast* may be explained, they suggest, as Martin recreating 'the "chemical red hue" of transparent glass'.[59] The reference to Martin's light having an artificial 'chemical red hue' originates with a review in Ackermann's *Repository* of Martin's 1822 exhibition at the Egyptian Hall where the *Fall of Babylon* was hung alongside the *Destruction of Pompeii and Herculaneum* (1822).[60] Behind this may be Goethe's classification of material colours as 'chemical' and reference to the permanency of these colours when 'fixed in glass by fusion'.[61] Martin's 'igneous totality of colour' is similar, perhaps, to the sublime transformation of a real landscape when viewed through a Claude glass or a landscape study within an enclosed version of the optique where a red glass slide had been placed in front of it to modulate the effect.[62] Goethe, reflecting on the heightened emotional

[58] Isobel Armstrong, *Victorian Glassworlds: Glass Culture and the Imagination, 1830–1880* (Oxford: Oxford University Press, 2008), p. 278.
[59] Myrone and Austen (pp. 68, 104) rely solely on Yampolsky even though his authority is based on nothing more than a confused reading of Lawrence Lee, *Appreciation of Stained Glass* (London: Oxford University Press, 1977).
[60] 'Fine Arts: Mr. Martin's Exhibition', *Repository of Arts, Literature, Fashions, Manufactures etc*, 2nd ser., May 1822, pp. 300–01 (p. 300); Yampolsky, p. 140.
[61] Goethe, *Theory of Colours*, trans. by Charles Lock Eastlake (London: Murray, 1840), pp. xli, 201, 282. As he references Goethe elsewhere, this explanation is offered in response to Yampolsky's unsupported statement that 'chemical red hue is the colour of transparent glass Martin inevitably brings to his canvases' (p. 140).
[62] 'Fine Arts: Royal Academy Exhibition', *Examiner*, 28 June 1812, pp. 413–14 (p. 413); Pinson, p. 60. A Claude glass was a fan-like viewing tool with slides of

response to such a viewing experience, comments starkly: 'the red glass exhibits a bright landscape in so dreadful a hue as to inspire sentiments of awe' (p. 315).

The bluish ruby red seen in a medieval or later nineteenth-century stained glass window was not part of the Georgian glass painter's colour palette. Only silver stains glass but it can, potentially, produce a range of exceptionally brilliant and transparent colours from lemon yellow through to a fiery orange red, the latter closer to scarlet than ruby.[63] Goethe wrote of the emotionally stimulating effect of such reds tending towards yellow rather than blue: 'In looking steadfastly at a perfectly yellow-red surface, the colour seems actually to penetrate the organ [eye]. It produces an extreme excitement' (p. 310). The use of stains in the glass painting of *Belshazzar's Feast* is most effective in the foreground where they are used to suggest the material sublime through juxtaposition of red velvet and gold metal. As a review of Cooper's copy of Martin's *Fall of Babylon* remarked that 'the admirable delicacy with which the light and shade are brought out' was secondary to the 'astonishing brilliancy of the colours', the glass painting may have added the fieriness of the burning city lighting up the sky in the distance seen in the original oil painting to the sublime gloom of the mezzotint.[64] The igneous effects may have been similar to those seen in the east window of Redbourne church, Lincolnshire made by Collins (*c.* 1840) after Francis Danby's *Opening of the Sixth Seal* (1828) (*Fig. 6*) (see Binnall).

Red stain presented significant challenges as it required additional applications to achieve depth of colour and hence repeat firings, which placed the base glass under stress. Moreover, the colour would only develop if a specific type of base glass was used. When red stain was required, Cooper was very specific that 'for pictures and ornaments, where glass is required to produce a good red and withstand repeated firings, Crown glass made from Orkney kelp is best'.[65] He had this made to order by the Northumberland Glass Company in Newcastle (Rush-Bambrough, pp. 39, 100). For the same reason, as far away as London, Hoadley and Oldfield also relied on 'the best Newcastle crown (and not too thick, or it is liable fly [crack] in the firing)' (Philotechnicos, p. 156). Today, the modern stained glass conservator struggles to match Georgian red stain primarily due to

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different coloured glasses mounted in circular frames, small enough to be carried in the pocket. It was used by landscape artists to observe nature with different tonal and lighting effects.

[63] Recipes for glass stains are given in Nathaniel Whittock, *The Decorative Painters' and Glaziers' Guide* (London: Taylor Hinton, 1828), pp. 232–34.

[64] 'The Fine Arts', *Caledonian Mercury*, 21 December 1837, p. 2.

[65] William Cooper, 'Glass Used for Staining and Enamelling etc.', Aberdeen, 12 February 1849, unpublished essay, Edinburgh, National Library of Scotland, Acc. 4534/122.

Fig. 6: William Collins (signed by), *Opening of the Sixth Seal*, after Francis Danby, *c*. 1835–45, east window, St Andrew's, Redbourne, Lincolnshire. Jules & Jenny, Wikimedia Commons. CC BY 2.0.

changes in glass manufacture introduced in the mid-nineteenth century.[66] Glass is made from sand with fluxing agents, a combination of an alkali and lime, added to lower its melting temperature. In Britain a traditional alkali was kelp, the calcined ashes of burnt seaweed, sourced from Scotland and Ireland. Kelp was gradually abandoned following the introduction of industrially produced synthetic soda made by the conversion of common salt into sodium carbonate, known as the Leblanc Process (patented by Nicolas Leblanc in 1791).[67]

Until the 1830s all window glass produced in Britain was made by the traditional crown method where molten glass was gathered on the end of a blowpipe, inflated into a globe which was then transferred onto an iron rod or 'pontil' leaving a small aperture where it was cut away from the blowpipe, and then spun into a disc at the furnace mouth, the heat polishing the surface. As, in order to form a perfect disc, it needed to withstand both centrifugal and gravitational forces, the molten glass or 'metal' required a firm 'temper' and so was left to stand for several hours in the cooling furnace before being worked. The consequent 'hardness' of crown glass meant that it could also withstand the repeated firings of stains and enamels in the glass painter's kiln. Beyond changes in the type of alkalis used, the new sheet glass developed by Chance Brothers & Company in the 1830s was softer and less well suited to glass painting.[68] Just as the size of the glass paintings after Martin (48.3 × 72.4 cm and 45.7 × 66.0 cm) was perhaps determined by the size of the prints they were copied from, this also correlates with the available size of sheets of crown glass. Cooper gives 49 inches as the average size of a full disc or 'table' of crown glass but worked with tables of up to 51 inches. From half a 50-inch table, avoiding the pontil mark at the centre, the largest approximately square panes he could cut were 34 × 16.5 inches (86.4 × 41.9 cm), 26 × 19.5 inches (66.0 × 49.5 cm), or 24 × 20 inches (61.0 × 50.8 cm) (*Crown Glass Cutter*, p. 49).

Martin confirmed to the Select Committee on the Arts and Manufactures in 1835 that 'I should have painted some of my own subjects, as the effect on glass would be particularly adapted to them' but gave expense and risk of failure as the reasons for abandoning this (HC Paper no. 568, p. 72). Over and above the investment in copying processes and sourcing of appropriate glass, the literal recreation of the material sublime in the glass painting of *Belshazzar's Feast* pushed the art of glass painting

[66] Keith Barley, 'Trials and Observation in the Use of Silver Stain', *Stained Glass*, 1 (1996), 11–13 (p. 12).
[67] Archibald and Nan L. Clow, 'The Natural and Economic History of Kelp', *Annals of Science*, 5 (1941–47), 297–316; T. C. Barker, R. Dickinson, and D. W. F. Hardie, 'The Origins of the Synthetic Alkali Industry in Britain', *Economica*, n.s., 23 (1956), 158–71.
[68] Cooper, 'Glass Used for Staining and Enamelling etc.'; and *Crown Glass Cutter and Glazier's Manual*, pp. 23–34.

to its technical limits. The glass paint and each colour of stain or enamel was fired at different temperatures and so the painting of the piece had to be sequenced accordingly over an extended period. With specific reference to a version of *Belshazzar's Feast*, Arthur Aikin, secretary to the Society of Arts, explained the extraordinariness of its technical achievement to the 1835 parliamentary committee tasked with investigating the impact of taxation on the glass industry:

> I have seen at Mr. Collins's a beautiful representation on glass of the picture of the Feast of Belshazzar. Now plates of that kind, with elaborate work on them, like that just mentioned, require to go into the oven or stove nearly as many times as there are different colours, and [...] after an artist has employed several months upon a piece of glass, the last time that it is taken out of the fire it may crack, and all his labour be lost.[69]

Conclusion

Within his own city and in front of his own audience at the Royal Scottish Society of Arts, Cooper's glass paintings were weighed in the balance and found wanting. In December 1843 the society was addressed by Charles Heath Wilson (1809–1882) as the newly appointed director of the Government Schools of Design. He had recently returned from a tour of the Continent which had included a visit to the Royal Bavarian Stained Glass Establishment. Under the patronage of Ludwig I, experiments were being undertaken with the manufacture of coloured glasses and leading academic artists were commissioned to design monumental stained glass windows for public buildings. Wilson had a vision of the future for stained glass as a public art form in Britain. As he had recently taught at the Trustees' Academy of Design in Edinburgh, a drawing school for apprentices, he surely had Cooper specifically in mind when he observed: 'And as to the copies from ancient masters, from Mr. Martin's coloured prints, the portraits of noble lords, &c. &c., the sooner these are sent to the glass-house, to be melted for some useful purpose, the better.'[70] This statement in itself explains the loss of many works from, arguably, the most highly skilled

[69] 'Appendix No. 30: Arthur Aikin, 14 March 1835', in *Thirteenth Report of the Commissioners of Inquiry into the Excise Establishment: Glass* (London: HMSO, 1835), pp. 118–19 (p. 118).

[70] C. H. Wilson, 'Decorative Art in Germany', *Art-Union*, December 1843, pp. 304–07 (p. 306), an abridged version of his lecture given at the RSSA in Edinburgh; George Fairful Smith and George Rawson, 'Charles Heath Wilson's Career', in *Missionary of Art: Charles Heath Wilson, 1809–1882*, ed. by George Rawson (Glasgow: Foulis Press, 2000), pp. 6–12 (pp. 7–8).

period in the history of glass painting. Recognizing that he was out of step with the times and that the skills he had laboured to perfect were rapidly becoming redundant, Cooper emigrated to America.[71]

Hoadley and Oldfield's 1828 glass painting after *Belshazzar's Feast* is a rare survivor and has had a tenacious historical presence. While its inclusion in the Tate Britain 'John Martin, Apocalypse' exhibition and its direct association with other works by Martin returned it to its rightful context, even though the potential influence of glass painting upon Martin's use of light and colour was acknowledged, it was neither researched nor examined closely. It should be viewed not as a trivial version of the original oil painting but as a masterful translation of it where the glass painter 'by the transparency' of the medium experimented with 'the full-scale of nature as to light and shadow'. Viewing it with the *Description of the Picture Belshazzar's Feast* to hand, and directly comparing it to the oil painting and the mezzotint, allows for an aesthetic reassessment of the glass painting as the most perfect illusion of a 'perspective of light'.

[71] I am very grateful to Julie Sloan for sharing her as yet unpublished research into Cooper's later career in America.