Animating Flames: Recovering Fire-Gazing as a Moving-Image Technology

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> People gazing at a gaslight no longer lost themselves in dreams of the primeval fire; if anything, they were thinking of the gas bill. As a rule, though, no one looked at the gas flame any more at all.[1]

In his impressive cultural history of the industrialization of light, Wolfgang Schivelbusch narrates the oft-lamented and fatal confrontation between fire-gazing and artificial light. A form of flame-based reverie, fire-gazing typically involves a solitary viewer who perceives animated, moving images dissolving into and out of view in a wood or coal fire. The flames may suggest arbitrary pictures, reveal fantastic landscapes, or trace more familiar forms, such as the faces of friends and family. While fire-gazing remained a popular trope of the imagination in nineteenth-century British literature, the adoption of gas lighting in domestic spaces between 1830 and 1880 rendered the actual practice of fire-gazing increasingly obsolete.[2] Gas offered a more economical form of heat and illumination, but the heightened luminosity of gas flames proved too harsh for fire-gazing, and the emerging popularity of electric light in the 1890s further diminished the need for flame-based light.[3] Accounts dating back to Ancient Greece and Rome identify fire-gazing as a technique for divination, but in

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[1] Wolfgang Schivelbusch, *Disenchanted Night: The Industrialization of Light in the Nineteenth Century*, trans. by Angela Davies (Berkeley: University of California Press, 1995), p. 29. Schivelbusch is referring to Gaston Bachelard's discussion of 'primeval fire' in *La Flamme d'une chandelle* (1961). My argument builds from Schivelbusch's work by more fully examining the affective responses to firelight and by theorizing fire as a media technology.

[2] For an impressive overview of literary references to fire-gazing that was compiled in the nineteenth century, see Francis Jacox, *At Nightfall and Midnight: Musings After Dark* (London: Hodder and Stoughton, 1873), pp. 145–58.

[3] Though early estimates of luminosity and incandescence were imprecise, gas was often characterized as providing brighter, clearer, and more affordable light. For a history of photometry (the scientific measurement of light) and shifting attitudes towards gas and electric light, see Christopher Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800–1910* (Chicago: University of Chicago Press, 2008). Unless otherwise noted, *The Victorian Eye* is my source for references to historical dates and innovations related to the industrialization of light.

nineteenth-century England, fire-gazing represented a nostalgic return to a pre-industrial imagination.[4] However, more than just a romanticized symbol, fire-gazing is an early and individualized moving-image technology that persists in print despite the industrialization of light and the proliferation of mechanized animation technologies.

Flames exist on a continuum with other nineteenth-century animation technologies and were often incorporated into those proto-cinematic entertainments as either the fuel or the subject. For instance, early iterations of magic lanterns relied on the flickering movement of flames to simulate motion while projecting painted images from glass slides onto a stage or screen. Though the industrialization of light eliminated fire-gazing, it enabled concurrent developments in animation technologies and optical devices by providing stronger sources of light that could project images across greater distances or produce more convincing illusions.[5] Public magic lantern shows, or phantasmagorias, paraded reanimated ghosts on British stages as early as 1801.[6] By the late nineteenth century, the incandescent beam of light that projected moving images became synonymous with animation, as if light alone could transform still images into stuttering motion.[7] But I want to redirect our attention from the animated, moving images on the stage or screen to their luminous source. This article argues that flame itself is an animated, moving-image technology, and that fire-gazing must be included in the history of animation technologies as an outmoded yet more intimate form of perceiving and producing moving images.

Recent scholarship has shown how the apparent distinctions between mechanical copying and 'high art' were less confidently drawn following late nineteenth-century inventions that enabled automatism and mass reproducibility, but the conscious and unconscious modes of perception

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[4] For the role of fire-gazing in ancient divination, see Sarah Iles Johnston, 'Charming Children: The Use of the Child in Ancient Divination', *Arethusa*, 34 (2001), 97–117.

[5] Richard Altick correlates the 1782 invention of the Argand lamp with the magic lantern's popularity after the 1770s in *The Shows of London* (Cambridge, MA: Harvard University Press, 1978), p. 117. In *The Magic Lantern: How to Buy, and How to Use It: Also How to Raise a Ghost* (London: Houlston and Wright, 1866), the instructional guide, narrated by 'a mere phantom', explains why different types of light sources are required for different types of magic lanterns. When projecting an image in a 'lecture-room where a disc [the projected image] of twenty or perhaps thirty feet is necessary, some means of producing a more brilliant light must be adopted' (pp. 25–26). In that particular instance, the guide recommends 'oxycalcium and oxyhydrogen lime-lights' (p. 26), but it also has instructions for other types of light, including oil and a few types of gas.

[6] Terry Castle, 'Phantasmagoria: Spectral Technology and the Metaphorics of Modern Reverie', *Critical Inquiry*, 15 (1988), 26–61 (p. 37).

[7] Lynda Nead, *The Haunted Gallery: Painting, Photography, Film c. 1900* (New Haven: Yale University Press, 2007), p. 235. For Nead's excellent discussion of the iconography of the beam of light and its relationship to animation, see pp. 233–44.

involved in fire-gazing locate latent expressions of these anxieties earlier in the nineteenth century.[8] These concerns appear in literary depictions of fire-gazing that invoke two duelling nineteenth-century notions: that fire-gazing is a heat-induced trance and form of unconscious reverie, or that it involves both conscious and involuntary processes, the coordination of which testify to the ingenuity of the viewer. In demonstrating the continuities between flames, fire-gazing, and mechanized moving-image technologies, this article traces shifting ideas about the imagination in an industrialized era. After reviewing why an analysis of fire-gazing requires a joint literary and media history approach, I turn to Michael Faraday's theorization of flame as a moving image in the mid-nineteenth century. Then, I look further back to Leigh Hunt's early nineteenth-century essay 'A Day by the Fire' (1811) to demonstrate connections between fire-gazing, the imagination, and writing. The final section analyses scenes of fireside (re)animation in Charles Dickens's *Our Mutual Friend* (1864–65), including those featuring one of his more famous fire-gazers, Lizzie Hexam, to show how Dickens revitalizes, in print, a form of media literacy otherwise extinguished by the emergence of industrialized light.

Flames

My methods and purposes for recovering fire-gazing as a moving-image technology share a kinship with 'media archaeologists [who] have begun to construct alternate histories of suppressed, neglected, and forgotten media that do not point teleologically to the present media-cultural condition as their "perfection"'.[9] Rather than extracting fire-gazing from layers of literary sedimentation, I show how the shared media histories of print and fire preserve a subjective method of producing moving images that interacts with more standardized and mechanized entertainments. Jay David Bolter and Richard Grusin theorize this interaction as the process of remediation, in which both old and new forms of media borrow from and refashion one another.[10] The concept of remediation has proven fruitful for both literary and media scholars. Following the logic of remediation, John Guillory explains that the definition of 'media' must also include 'premodern

[8] For one example of this scholarly work, see Lisa Gitelman's discussion of automatic writing in *Scripts, Grooves, and Writing Machines: Representing Technology in the Edison Era* (Stanford: Stanford University Press, 1999).
[9] Erkki Huhtamo and Jussi Parikka, 'Introduction: An Archaeology of Media Archaeology', in *Media Archaeology: Approaches, Applications, and Implications*, ed. by Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011), pp. 1–21 (p. 3).
[10] Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 1999), p. 5.

arts' because they are later incorporated into modern media technologies.[11] Recently, Helen Groth has analysed nineteenth-century 'inter-medial' reading practices that developed through a shared consumption of visual and textual materials in order to demonstrate how 'images move both inside and outside the mind'.[12] Building from these works, I contend that literary representations of fire-gazing constitute an act of remediation and that fire is a missing element in cultural histories of nineteenth-century moving-image technologies. Since wood and coal fires crackle, flicker, and smoke while emitting heat and light, nineteenth-century accounts of fire-gazing let us examine a multisensory, and consequentially highly individualized, form of animation within the shared contexts of literary and media histories.

Analysing fire-gazing through literary remediations is necessary due to the ephemeral nature of flames and because both fire-gazing and literature are imbricated in nineteenth-century conceptualizations of the imagination. Scholars such as Isobel Armstrong, Jonathan Crary, Kate Flint, and Tom Gunning have shown that the materials and processes of industrialization enabled new ways of seeing, which, in turn, modified imaginations and reinforced associations between vision, light, and the production of knowledge.[13] As sophisticated, mechanized moving images and strong sources of 'artificial' light began to characterize the experience of modernity, fire-gazing became associated with childlike, unconventional, and unscripted modes of seeing. In 1904 pioneering psychologist and theorist of child development Granville Stanley Hall praised 'the charm of fire-gazing [because it] is a great school of the plastic imagination'.[14] Responding to his media-saturated environment, Hall continues:

> Here, for once, children in our over-illuminated age and land escaped the pedagogic grafters and put forth a fresh, vigorous, wild shoot that is indigenous and expresses their own soul and does not merely reflect what adults have put into it. Better yet, each makes his own Jack Frost, and he is still plastic,

[11] John Guillory, 'Genesis of the Media Concept', *Critical Inquiry*, 36 (2010), 321–62 (p. 322).
[12] Helen Groth, *Moving Images: Nineteenth-Century Reading and Screen Practices* (Edinburgh: Edinburgh University Press, 2013), pp. 2–3.
[13] Isobel Armstrong, *Victorian Glassworlds: Glass Culture and the Imagination, 1830–1880* (Oxford: Oxford University Press, 2008); Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1992) and *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: MIT Press, 2001); and Kate Flint, *The Victorians and the Visual Imagination* (Cambridge: Cambridge University Press, 2000). Tom Gunning is cited below.
[14] Granville Stanley Hall, *Adolescence: Its Psychology and Its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion and Education*, 2 vols (New York: Appleton, 1904), II, 188.

> unconventionalized, ununiformitized, and unstandardized. (II, 188)

For Hall, fire-gazing should be celebrated as an extension of a primitive, organic, and untamed imagination that allows children to generate autonomous moving images unshaped by pre-existing templates. Yet not all representations of childhood fire-gazing invoke the plastic imagination, as seen in Asa Briggs's analysis of an 1870 children's book, in which an animated lump of coal lectures attentive children on its scientific properties and importance to British industry.[15] In that case, the didactic mode of the children's book presses an otherwise fantastical moving-image technology into service as both education and entertainment.

The nostalgic connotations of fire-gazing were not always viewed, though, in such a positive light. Moreover, the link between fire-gazing and children sometimes provided a means of castigating fire-gazers as infantile and uncivilized. As one late nineteenth-century writer of popular science scoffed, fire-gazing was 'the favorite recreation of idiots'.[16] Citing the exorbitant consumption of coal and the resulting soot that 'begrime[s] our towns' and damages health, the writer argues that only the 'self-delusion' of a 'fire-worshipper' would imbue a fireside with the perceived charms of warmth, comfort, and 'cheerfulness' (p. 236). Modern efficient stoves, he continues, threaten the childish 'fire-worshipper' who is reluctant to forfeit 'his playthings, as neither poker, tongs, nor coal-scuttle are included in the furniture of an apartment thus heated' (p. 239). Whether championed or condemned, the varying inflections of fire-gazing as frivolous pastime, didactic instrument, or playground for the plastic imagination reflect a larger concern about the fate of the imagination in an industrialized age saturated by prefabricated images. This concern manifests itself in literature because, as we will see, there is a long-standing association between fire-gazing and literary invention.

The positive perceptions of fire-gazing as an unstandardized and creative practice rely on an inherent understanding of flame itself as a moving image. Michael Faraday theorized flame as an animated moving image in *The Chemical History of a Candle*, a series of lectures delivered at the Royal Institution between the late 1840s and early 1860s. *Household Words* dramatized the immensely popular lectures in 1850, and Faraday's readership grew even further when he published them in 1861.[17] With

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[15] For Asa Briggs's analysis of *The Wonders of Common Things* (1870) by Annie Carey, see *Victorian Things* (London: Batsford, 1988), pp. 295–97.

[16] William Mattieu Williams, *Science in Short Chapters* (New York: Funk & Wagnalls, 1883), p. 236.

[17] See Percival Leigh, 'The Chemistry of a Candle', *Household Words*, 3 August 1850, pp. 439–44. For additional information about the history of these lectures, refer to the 2011 Oxford University Press edition of *The Chemical History of a Candle* intr. by

the predominantly juvenile audience of the lecture hall in mind, and in want of a dramatic practical demonstration, Faraday recreates a game of snapdragon, a popular parlour game that involved lighting a bowl or dish of brandy on fire. Faraday instructs:

> You must not imagine, because you see these tongues all at once, that the flame is of this particular shape. [...] It consists of a multitude of different shapes, succeeding each other so fast that the eye is only able to take cognizance of them all at once.[18]

Faraday depicts the multiple flickering shapes that the eye mistakenly perceives as a cohesive flame (*Fig. 1*). 'The different parts [...]', Faraday explains, 'do not occur all at once; it is only because we see these shapes in such rapid succession that they seem to us to exist all at one time' (pp. 37–38). Faraday's analysis of flame invokes the persistence of vision, the illusion of a cohesive moving image produced by the rapid succession of still images. Persistence of vision remains a necessary component of any moving-image technology, including film. As Lynda Nead reminds us, 'the central paradox of film is that there is no movement on the screen, only a succession of stationary images' (p. 22). The phenomenon fascinated nineteenth-century viewers who delighted in newly available methods for observing moving images, ranging from relatively simple optical toys to the panoramic landscapes of railway travel.[19] Faraday's disarticulation of flame displays his skill as a viewer and demystifies the persistence of vision for his audience without naming it as such. Given the intrinsic flickering motion of flames, and that flame itself is an illusory composite image, I argue that fire-gazing is an early animation technology that trained viewers to perceive the combination of multiple shapes into apparently seamless moving images, and that flames and fire-gazing exist on a continuum with other moving-image technologies.

Tom Gunning's remarkable study of the persistence of vision and the 'technological image' locates the origins of Victorian cinema in nineteenth-century optical toys such as the thaumatrope.[20] His argument helpfully resists the frequent association between automatism and the consumption of animated images by emphasizing the interactive production required of the technological image, and I linger on that interaction here to

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[18] Michael Faraday, *The Chemical History of a Candle*, ed. by William Crookes (New York: Harper, 1861), p. 37.

[19] Lynda Nead analyses what she terms 'velocities of the image', ranging from mutoscopes to railway travel and speeding cars in *The Haunted Gallery*.

[20] Tom Gunning, 'Hand and Eye: Excavating a New Technology of the Image in the Victorian Era', *Victorian Studies*, 54 (2012), 495–516 (p. 499).

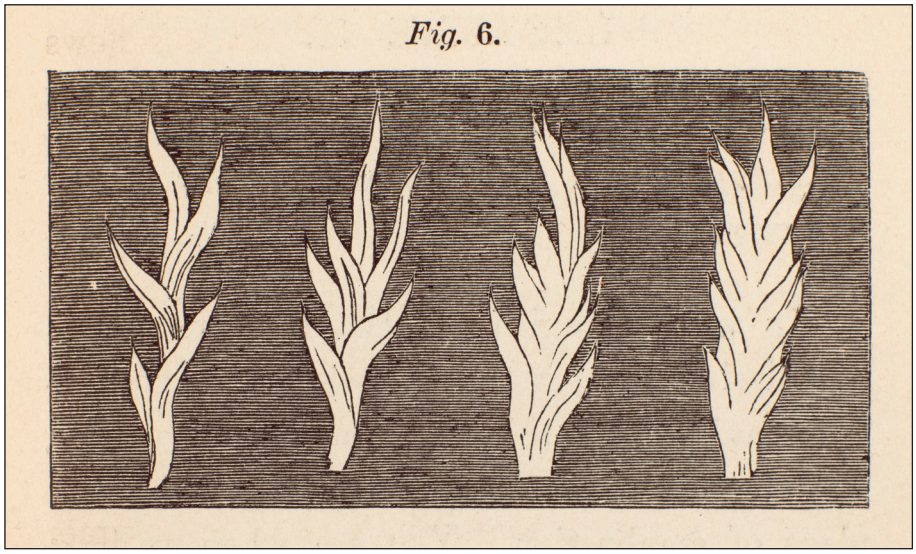

Fig. 1: Michael Faraday, 'Analysis of Flame', in *Course of Six Lectures on the Chemical History of a Candle*, ed. by William Crookes (London: Griffin, Bohn, 1861), p. 29. RB 704819. The Huntington Library, San Marino, California.

demonstrate how fire-gazing further refines the archive of moving-image technologies. The term 'technological image' applies to 'images produced by technological means' and to 'images that owe their existence to a device and are optically *produced* by it rather than simply reproduced' (pp. 499, 500, emphasis in original). For instance, the thaumatrope, first invented in the 1820s, is a paper disc affixed to a string with two images, one on each side. When operating a thaumatrope, a viewer must twist the string between their fingers, flicking the paper disc quickly from one side to the next and back again. As Gunning explains, the alternating images leave temporary impressions on the viewer's retina, allowing the images to combine in the eye through a dual process: the conscious, physical manipulation of the toy at the optimal speed, and the unconscious, involuntary processing of visual information. The repeating after-images culminate in the persistence of vision, which is 'more frequently referred to today as "flicker fusion"', a term that I find even more appropriately suited for the medium of fire (p. 499).

As with the 'cooperation of hand and eye' required to produce the technological image (Gunning, 'Hand and Eye', p. 507), fire-gazing requires conscious and unconscious actions, and the resulting flicker fusion of shapes and pictures in the flames provides a more intimate form of media production and consumption. Of course, degrees of personalization and subversion were possible for the technological image.

Viewers could create their own thaumatropes, for example, and generate visual illusions as varied as their artistic abilities and knack for visual tricks and puns. But if a viewer operates a thaumatrope correctly, the images will fuse in a predictable combination. Compared to the prefabricated limitations of the technological image, the flicker fusion of flames and fire-gazing creates infinite shapes and pictures. Moreover, flames cannot be mass-produced and pre-packaged for commercial distribution and consumption. Fire-gazing was an ephemeral and highly individualized experience with moving images that depended on the skill of the viewer, the type and quantity of kindling, the rate of combustion, and other varying conditions. In fire-gazing, the source of the image may be more mystifying than that of the technological image, invoking the divine or the unconscious, but it also facilitates a more personal form of associative production between spectator and image. This is part of the reason why fire-gazing was often depicted as a nostalgic symbol of a pre-industrial imagination: its more playful and individualized form of media represented an alternative to the prefabricated and standardized content of machine-produced moving images. As such, fire-gazing offers an opportunity to further refine the perceptions of automatism and imagination in scholarly studies of nineteenth-century literature and moving-image technologies.

Reverie

The material and immaterial qualities of fire made it a perfect catalyst for, and symbol of, imperceptible mental processes like reflection and imagination, which Leigh Hunt foregrounds in his 1811 essay 'A Day by the Fire'. The essay describes the daily habits of a figure called 'the Firesider', a consummate fire-gazer who, despite his apparent idleness, actively produces and records pictures in the fire. In 1870 an editor of Hunt's essays noted the thematic similarity to 'Estianomy, or the Art of Stirring a Fire', a 1794 essay by 'Charles Lamb's friend and school-mate', Charles Valentine Le Grice.[21] 'Estianomy' offers a satirical set of maxims for stirring the fire that distinguishes mechanical repetition from supposedly inherent artistic abilities, a framework that Hunt builds from when he forges connections between the

[21] Leigh Hunt, 'A Day by the Fire', in *A Day by the Fire; and Other Papers, Hitherto Uncollected*, ed. by Joseph Edward Babson (London: Sampson, Low, Son, and Marston, 1870), pp. 13–41 (p. 14). 'A Day by the Fire' is sometimes mistakenly attributed to William Hazlitt because the essay appeared in Hunt and Hazlitt's collection of essays, *Round the Table*, first published in the *Examiner* between 1815 and 1817. However, Babson helpfully clarifies that 'A Day by the Fire' first appeared in the *Reflector* with 'Hunt's well-known signature': a manicule (p. 42).

external materials involved in fire-gazing, the Firesider's interior creative faculties, and literary history.[22] Although the reader never sees Hunt feverishly transcribe the images he perceives while fire-gazing, excerpts from Coleridge, Cowper, Shakespeare, and Milton punctuate the descriptions of his daily obligations. These literary touchstones and Hunt's evocative prose describe fire-gazing as a moving-image technology that is inextricable from reading and writing. However, similar to Le Grice's instructions for stirring the fire, Hunt's essay inadvertently describes both fire-gazing and literary invention as mechanically reproducible disciplines, and an uneasy connection emerges between mechanical copying and creative practice.

Hunt presents fire-gazing as a multisensory activity that requires mental and physical dexterity, which resists later characterizations of fire-gazing as an idle, artless, and childish activity. As a self-identified Firesider, Hunt writes, 'it is part of my business to look about for helps to reflection; and, for this reason, among many others, I indulge myself in keeping a good fire from morning till night' (p. 15). The flames aid reflection, but the Firesider must also possess innate abilities to monitor the fire and to manipulate the poker, an 'awful, but at the same time artless, weapon' (p. 14). As with Gunning's description of the thaumatrope, Hunt's fire-gazer must marshal hand, eye, and mind to operate the poker and produce the illusion. However, unlike the technological image, the resulting flicker fusion is unpredictable and requires more artistry than mere mechanical activation, for only the 'care and kindliness of the [poker's] operator' will excite the flames and activate the imagination (p. 14). By emphasizing the ephemeral qualities of care and kindliness, Hunt mobilizes haptic, visual, and kinetic sensory experiences that require the conscious, embodied coordination of hand, eye, and imagination to produce, paradoxically, an otherwise dreamlike and hallucinatory display of moving images.

Hunt further distinguishes the conscious and unconscious skills of the Firesider who must 'pay [...] critical attention to the fireside' (p. 18). Using both voluntary and involuntary modes of perception means that 'nothing escapes the eye and the imagination' (p. 29). The eye, a biological sensory organ, and the imagination, an imperceptible mental action, work in unison to register every movement of the flame that 'swells', 'curls', and 'darts' around the grate (pp. 29, 30). The pictures that appear in the flames flit between real and fantastical topographies, such as 'the shifting forms of hills and vales and gulfs' and the incredible image of 'fiery Alps' (p. 30). However, the Firesider's 'critical attention' then gives way to a more absorptive and less conscious mode of viewing as 'heat and fire are forgotten, and

[22] C. V. Le Grice, 'Estianomy, or the Art of Stirring a Fire', in *The Tineum* (Cambridge: Lunn, Deighton, and Shepherd Bury, 1794), pp. 9–22.

walled towns appear' (p. 30). The flames offer an impossible extension of human sight that traverses space and time, even travelling to 'far-distant countries scarcely to be reached by human journey' (p. 30). The images dissolve into and out of focus due to involuntary actions in the eye, and Hunt acknowledges a further lack of control, claiming that the flames 'combine every shape and suggest every fancy, till at last, the ragged coals tumbl[e] together, [and] reduce the vision to chaos' (p. 30). Unlike the technological image that is predicated upon a predetermined end point, fire-gazing produces pictures as chaotic as the coal-fuelled fire that shifts, combusts, and expires.

Hunt refuses to completely relinquish the reins of the multisensory spectacle as he narrates the collaborative interplay between body, mind, and flame: 'During these creations of the eye, the thought roves about into a hundred abstractions, some of them suggested by the fire, some of them suggested by that suggestion, some of them arising from the general sensation of comfort and composure' (p. 30). The Firesider's gaze slips past the pictures in the fire, the creation of which he attributes to 'the eye', and into abstractions. Hunt acknowledges that the fire is responsible for suggesting some thoughts, while others arise in ways that mimic the associative processes of thinking and reflection, placing additional agency back into the hands and mind of the Firesider. Hunt does not ignore the unconscious or involuntary facets of fire-gazing, but his descriptions also harness the Firesider's sensory perceptions as creative conduits participating in a relay between mind, body, and fire. Hunt does not characterize fire-gazing as an unequivocal evacuation of the body, an absent-minded gazing, or a purely passive reception of dreamlike images. Instead, in Hunt's essay we find fire-gazing portrayed as a media technology that requires both automation and volition.

Hunt links fire-gazing with writing by creating a genealogy of Firesiders, but in doing so he exposes latent anxieties about mechanical reproduction. Hunt describes the Firesider's ideal posture: seated directly before the fire, reclined, with feet set apart on the fender and eyes cast downwards. This position coordinates the intellect and the senses as the Firesider rests

> his arms on the chair's elbows, one hand hanging down, and the palm of the other turned up and presented to the fire, — not to keep it from him, for there is no glare or scorch about it, but to intercept and have a more kindly feel of its genial warmth. It is thus that the greatest and wisest of mankind have sat and meditated; a homely truism, perhaps, but such a one as we are apt enough to forget. (p. 28)

The proffered hand is an invitation and an entreaty, a tactile extension of the eye mediating the distance between the Firesider's imagination and the fire. The hand intercepts the fire's heat and light, transferring the 'genial warmth' more immediately to the Firesider's eye and mind, and the shared pose creates a genealogy of scopic pleasures as well as a shared affective history of tactility and meditation. By aligning fire-gazing and writing, Hunt demonstrates that both activities are part unconscious, inexplicable, unquantifiable inspiration and part careful, studied, practised art form. Hunt makes classed assumptions about the Firesider's innate skills and sensibilities, but 'A Day by the Fire' also doubles unintentionally as a set of instructions that any reader could replicate indiscriminately and possibly achieve similar outcomes. An 1817 article in the *Literary Gazette* deflects the anxious relationships emerging between fire-gazing, creativity, and mechanical reproduction by highlighting the artist's prerequisite 'state of improved perception' that can 'give a local form, a character and name' to otherwise arbitrary 'shapes in the fire, a stained wall, or any thing of a like nature'.[23] Still, the potential for imitation exposes latent anxieties about the mechanization of the mind and body that are more frequently associated with later forms of communication and entertainment technologies.

In 1884 an article in *Blackwood's Edinburgh Magazine*, 'Figures in the Fire', realizes these anxieties about mechanization and mass production when the author, William George Hamley, describes the intertwined processes of fire-gazing and writing in an unromanticized, methodical fashion. Seeking refuge from the winter weather and mimicking the language of scientific observation, Hamley sits by the fire and narrates his plan to 'turn discomfort to commodity, and take note of the bodily and mental process of recovering an agreeable temperature. The result has been,' he says, 'not any addition to physiological science, but this discursive paper which I am beginning to write.'[24] He finds that the warmth 'did not soothe or lull' him; instead it 'induced an irritability of body and an unpleasant activity of mind' (p. 46). Disproving Hunt's assertion that fire-gazing requires 'care and kindliness', Hamley insists that a 'quantity of thoughts [...] came in unbidden' (p. 46). The images he perceives in the fire catalyse an apparently unmotivated stream of consciousness. Breaking down fire-gazing into distinct stages of the warming process and the concurrent mental symptoms, Hamley pauses occasionally to record his observations and the resulting pictures. In the first stage, a tumult of ideas appears, but as the body warms, the ideas cool, suggesting that the fire kindles thoughts directly before the body even registers the fire's warmth. In

[23] 'The Fine Arts', *Literary Gazette*, 23 August 1817, pp. 119–20 (p. 120).
[24] [William George Hamley], 'Figures in the Fire', *Blackwood's Edinburgh Magazine*, January 1884, pp. 46–63 (p. 46). The Wellesley Index attributes authorship to William George Hamley.

the second stage, ideas appear, but they 'drag slowly' and lose their impression (p. 46). During the third stage, 'a delightful glow steals over' him, and his 'ideas become exceedingly sluggish and dull' (p. 46). Describing this languid state, Hamley confesses that he has a 'desire to ponder' but no 'material for the process' (p. 46). Apparently untroubled by his lack of ingenuity, he writes, 'to such a blank state am I reduced that I peer into the coals, which are now more fantastic than my mind is, to see if haply they have a suggestion worth accepting' (p. 46). The only collaboration evident here is the fire-gazer's ability to accept or reject what the fire produces. Yet, rather than lamenting his self-admittedly dull wits, he proceeds to gaze at the 'more fantastic' coals and to transcribe the images directly into text.[25] Arbitrary and uninspired, the pictures range from the image of a hanging man to teacups (pp. 46–47, 52). After the first of these images appears, he refers to it as 'the principal figure in my fire-piece' and pronounces himself a 'fire-artist' (p. 47). 'Figures in the Fire' presents fire-gazing and writing as mechanized processes so easily reproducible that even an amateur viewer can convert pictures in the fire into a narrative 'commodity' (p. 46). Hunt and Hamley represent two extreme perspectives on fire-gazing — a romanticized filament of the imagination or a vacuous activity — but both reveal an understanding of fire-gazing as a technology of the moving image.

Fireside (re)animation

Two years before John Harmon haunted the pages of *Our Mutual Friend* (1864–65) as a 'living-dead man', another Dickensian ghost debuted on stage at the Royal Polytechnic Institution.[26] Dr Pepper's immensely popular magic lantern adaptation of the 1848 Christmas novella, *The Haunted Man and the Ghost's Bargain*, fascinated and educated audiences. Consisting of a public reading and visual spectacle, the multimedia performance ran parallel to the serialized instalments of *Our Mutual Friend*. In her analysis of inter-medial literacy, Helen Groth shows that Pepper counted on his audience's familiarity with Dickens's *Haunted Man* and that he incorporated additional readings in 1863 to provide a narrative frame for the technologically produced spectre.[27] Pepper's audience, then, would have

[25] Rudyard Kipling's 1902 short story 'Wireless' dramatizes a similarly cynical scene of automatic writing, in which a convergence of environmental factors and a wireless radio experiment allow a chemist's assistant to produce fragments of 'The Eve of St Agnes' as if he, and not John Keats, were the original poet. For a fascinating analysis of automatic writing in Kipling's story, see Richard Menke, *Telegraphic Realism: Victorian Fiction and Other Information Systems* (Stanford: Stanford University Press, 2008), pp. 217–48.

[26] Charles Dickens, *Our Mutual Friend*, ed. by Adrian Poole (New York: Penguin, 1997), p. 367.

[27] Groth, pp. 117–18. For Groth's detailed discussion of fire-gazing in *The Haunted Man*

remembered the novel's fire-gazing scenes, illustrated by John Leech and John Tenniel, that preceded the ghostly apparition. The ability for audiences to consume Dickensian ghosts and scenes of fireside animation simultaneously on stage and in print informs my understanding of how *Our Mutual Friend* responded to its media environment, reflecting the tastes of an increasingly literate audience who were also becoming sophisticated consumers of visual media. With this context in mind, we can read *Our Mutual Friend* as a response to Dr Pepper's Ghost, an assertion that staged magic lantern shows were not the only venues for thrilling visual illusions. Pepper's eerily lifelike phantom captivated audiences, but, as Groth points out, the purpose of the performance was primarily to demystify the moving spectral image (p. 117). *Our Mutual Friend*, on the other hand, revitalizes an unscientific and more fanciful form of imagination by staging acts of textual and visual media literacies alongside scenes of bodily reanimation and fireside animation.

The novel's preoccupation with bodily reanimation and media literacies indicates print's ability to preserve older forms of moving-image technologies, like fire-gazing, while also anticipating future innovations, like the cinema. The theme of reanimation begins with Old Harmon's will, which 'directs himself to be buried with certain eccentric ceremonies and precautions against his coming to life' (p. 26). His heir, the 'living-dead man' John Harmon, mechanically imitates life under the alias of John Rokesmith while securing his fortune. Reanimation resurfaces dramatically when locals resuscitate Rogue Riderhood after his near-fatal collision with a steamship and the narrator exclaims, 'See! A token of life! An indubitable token of life! The spark may smoulder and go out, or it may glow and expand, but see!' (p. 440). The animating spark, rekindled after colliding with modern technology, links fire with reanimation and underscores the vitality of the moving pictures that Lizzie Hexam sees while fire-gazing. Dickens's tendency to use coal-fuelled fire-gazing as a symbol of the imagination has been described as a form of escape for abused or impoverished characters according to Garrett Stewart, and as economically impossible and 'ahistorical' by Adelene Buckland.[28] Buckland explains

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as indicative of Redlaw's troubled memories and his inability to distinguish between reality and hallucinations, see pp. 100–25. Her chapter, which demonstrates that 'automatism' and 'wonder' operate in both Dickens's *Haunted Man* and Pepper's Ghost despite Dickens's dislike of mechanized entertainments and Pepper's preferences for scientific accuracy, also includes a great analysis of Tenniel's and Leech's illustrations for *The Haunted Man*.

[28] See Garrett Stewart, *Dickens and the Trials of Imagination* (Cambridge, MA: Harvard University Press, 1974), pp. 160–70; and Adelene Buckland, '"Pictures in the Fire": The Dickensian Hearth and the Concept of History', *Romanticism and Victorianism on the Net*, 53 (2009) <https://doi.org/10.7202/029902ar> (para. 5–7 of 30). Buckland also discusses Eugene Wrayburn's and Mortimer Lightwood's disguises as lime merchants, and their fire-inspired names, within the context of industrialized light and fears of diminishing coal supplies (para. 26–27). Also, for a related discus-

that Dickens often overlooked the material and economic limitations of coal fires in favour of coal's symbolic value as a source of humanity, transformation, and the imagination. Coal's symbolism, Buckland argues, illuminates how Lizzie Hexam's fire-gazing helps rehabilitate Bella Wilfer, and why a reformed Scrooge stokes a generous coal fire in the conclusion of *A Christmas Carol* (1843) (Buckland, para. 29, 8). Following the analysis of Stewart and Buckland, I argue that Dickens returns to coal in *Our Mutual Friend* to reanimate, in print, an unscientific and more fanciful form of media literacy. The novel's preoccupation with fire and (re)animation presents fire-gazing as a moving-image technology that retains its associations with domestic firesides and becomes a humanizing force in an industrial, artificially illuminated, and media-saturated era.

Rather than dismissing Lizzie's fire-gazing as childish fancy, as her brother Charley does later in the novel, Dickens foregrounds her fireside reverie as a vital form of media literacy.[29] Early in the novel, Lizzie confides in Charley that when she 'sit[s] a-looking' at the fire, the 'dull glow near' the coals 'comes like pictures' to her (p. 37). Prompted by the flicker fusion of the flames themselves, the associative pictures that 'come and go' recall both Hunt's account of the Firesider as well as the dissolving views of magic lantern shows.[30] Importantly, as the scene unfolds, Charley's reliance on textual literacy and scientific accuracy only highlights Lizzie's more creative reverie. When Charley looks at the burning coals, he announces:

> 'That's gas, that is, [...] coming out of a bit of a forest that's been under the mud that was under the water in the days of Noah's Ark. Look here! When I take the poker — so — and give it a dig —.' (p. 37)

But Lizzie intercedes, preventing Charley's overzealous stirring of the fire: 'Don't disturb it, Charley, or it'll be all in a blaze' (p. 37). Charley represents an artless fire-gazer, his perception constrained by geological history and biblical narratives, knowledge that he has accumulated, presumably, under Bradley Headstone's tutelage. Initially, Charley expresses interest in learning from Lizzie as well as Headstone, and implicitly invites the reader to join the instructional scene of fireside reverie when he directs Lizzie to 'show us a picture' and 'tell us where to look' (p. 37). At her brother's insistence, Lizzie gazes into the burning coals and a montage of their childhood memories materializes while Lizzie narrates: 'Sometimes

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sion about the association between fire and reverie in Elizabeth Gaskell's works, see Richard Leahy, 'Fire and Reverie: Domestic Light and the Individual in *Cranford* and *Mary Barton*', *Gaskell Society Journal*, 28 (2014), 73–88.

[29] Charley dismisses Lizzie's fire-gazing as dreaming and says it is necessary instead to '[look] into the real world' and to 'control your fancies a little' (pp. 227, 228).

[30] Isobel Armstrong discusses the technical aspects of dissolving views in magic lantern shows in *Victorian Glassworlds*, pp. 258–59.

we are sleepy […], sometimes we are very hungry, sometimes we are a little frightened' (p. 37). Impressed, Charley tells Lizzie that she has substituted 'the hollow down by the flare' for a 'library of books', placing her fireside reverie on a continuum with, though definitely secondary to, books and textual literacy (p. 39).

Skilfully combining conscious and unconscious modes of perception, Lizzie's fire-gazing produces pictures from their personal histories rather than simply repeating the history of the coal itself. Though Lizzie guides Charley's gaze, he complains, 'There seems to be the deuce-and-all in the hollow down by the flare' (p. 38). Charley is a helpless pupil when it comes to imaginative 'a-looking', and his failure foreshadows a growing divide between Charley and the Hexam fireside. Lizzie foresees this rift when Charley requests a 'fortune-telling' picture, and the pictures in the fire show him becoming a teacher while she stays home with their illiterate father, Gaffer Hexam (pp. 38–39). Lizzie's attitude towards education is fundamentally different from Gaffer's, who proudly illustrates that he cannot read by pointing to the handbills 'stuck against the wall' in his home and announcing that he 'know[s] 'em by their places on the wall' (p. 31). Gaffer reduces printed words to static shapes decipherable only by the handbills' relative spatial arrangement, whereas Lizzie's moving pictures in the fire, remediated in text, suggest that printed words can also conjure moving pictures. Prompted by the 'natural light' of the coal fire, Lizzie's fire-gazing models collaborative image making for the reader, if not for the hopelessly unimaginative Charley, and draws upon the cultural memories of coal and fire-gazing as outmoded technologies to navigate tensions between individualized imaginations and mass-produced media.

Though Lizzie's fire-gazing enabled Charlie's scholastic ambitions, Bradley Headstone's inflexible educational methods cannot tolerate her highly individualized 'a-looking'. For instance, when Charley first explains to Headstone that Lizzie has substituted pictures in the fire for books, Headstone tersely replies, 'I don't like that' (p. 230). His rigid response suggests his disapproval of fire-gazing's primitive connotations and his inability to accommodate an unregulated form of imagination not subject to the narrative constraints of other frameworks, a point visually reinforced by the fact that the Hexams' coal-fire grate is not enclosed by a fireplace. Lizzie's textual illiteracy is an obstacle that she wants to overcome, but her fire-gazing reappears throughout the novel, offering a humanizing alternative to the rote and strictly textual literacy represented by Bradley Headstone and, consequently, by Charley Hexam. The Hexam siblings' disparate modes of perception dramatize the thematic conflict between rote education and fancy that Dickens memorably explored a decade earlier in *Hard Times* (1854), a novel that features another educator with an alarming surname. Valuing only facts and abhorring fancy, Mr Gradgrind's teaching

philosophy is as pulverizing as Headstone's is deadening, and we see its detrimental impact on the imagination of his daughter, Louisa Gradgrind, who often gazes into the fire but only sees 'the short-lived sparks that so soon subsided into ashes'.[31] Lizzie avoids Louisa's fate as she learns to read, weaving together textual and visual literacies.

The motif of animating fire continues in Mr Venus's shop, and the narration of the scene, combined with Marcus Stone's wood engraving, shows how print media can remediate fire as a moving-image technology. In Stone's illustration, 'Mr Venus Surrounded by the Trophies of his Art', a kettle boils in the fireplace and its steam entwines with the fire's smoke, providing an illusion of movement that contrasts with the still-life figures that adorn the taxidermist's shop (*Fig. 2*).

The movement represented in Stone's illustration reflects Mr Venus's pride in capturing potential movement in his taxidermy figures. Referencing a canary, Mr Venus declares, 'There's animation! On a twig, making up his mind to hop!' (p. 86). Mr Venus's skills already convey a semblance of animation, but when Silas Wegg opens the door to leave the shop, the light of a guttering candle flame springs the shop into flickering motion:

> The movement so shakes the crazy shop, and so shakes a momentary flare out of the candle, as that the babies — Hindoo, African, and British — the 'human warious', the French gentleman, the green glass-eyed cats, the dogs, the ducks, and all the rest of the collection, show for an instant as if paralytically animated. (p. 91)

The narration remediates the inherent flicker fusion of firelight, creating not only the illusion of motion, but reanimating stilled life into living, moving pictures. The setting of the taxidermist's shop is particularly important for demonstrating that print can preserve and reanimate outmoded animation technologies. Like Lizzie's fire-gazing, Dickens's narration and Stone's illustration prompt the reader to participate in animating the scene.[32] Stone's illustration and Mr Venus's taxidermy both suggest movement, and Dickens's narration of a flickering candle flame highlights the interactions between fire, image, and text.

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[31] Charles Dickens, *Hard Times*, ed. by Paul Schlicke (Oxford: Oxford University Press, 1998), p. 124. The relationship between fire-gazing and literacy appears in this novel as well. In one scene, Louisa seems 'as if she were reading what she asked in the fire, and it were not quite plainly written there' (p. 69).

[32] Jane R. Cohen describes the collaborative relationship between Dickens and Marcus Stone in *Charles Dickens and His Original Illustrators* (Columbus: Ohio State University Press, 1980), pp. 203–09. Cohen notes that Stone readily accepted Dickens's directions and that Dickens, in turn, granted Stone some degree of autonomy.

Fig. 2: Marcus Stone, 'Mr Venus Surrounded by the Trophies of his Art', wood engraving, in Charles Dickens, *Our Mutual Friend*, 2 vols (London: Chapman and Hall, 1865), I, facing p. 61. RB 122456. The Huntington Library, San Marino, California.

Lizzie herself becomes an animated fireside image in the mind of Eugene Wrayburn, recalling older technologies of the moving image as well as prefiguring the early film technologies that would emerge in the late nineteenth century. After first encountering Lizzie sitting by the fire engaged in needlework, Eugene confesses to Mortimer Lightwood, 'that lonely girl with the dark hair runs in my head. It was little more than a glimpse we had of her that last time, and yet I almost see her waiting by the fire to-night' (p. 163). Lizzie Hexam's image *runs* like an endlessly repeatable moving image or a continuous film strip approximately twenty years before Eadweard Muybridge's Zoopraxiscope 'projected some of the world's first moving pictures in 1882' (Castle, p. 41). In a later scene, after leaving the Six Jolly Fellowship Porters, Eugene creeps up to the Hexams' window. From Eugene's point of view, the window frames Lizzie's reverie and makes her private fire-gazing available for public consumption (*Fig. 3*). As Eugene gazes through the window, the narrator describes her sitting

> on the ground, looking at the brazier, with her face leaning on her hand. There was a kind of film or flicker on her face, which at first he took to be the fitful firelight; but, on a second look, he saw that she was weeping. (pp. 164–66)

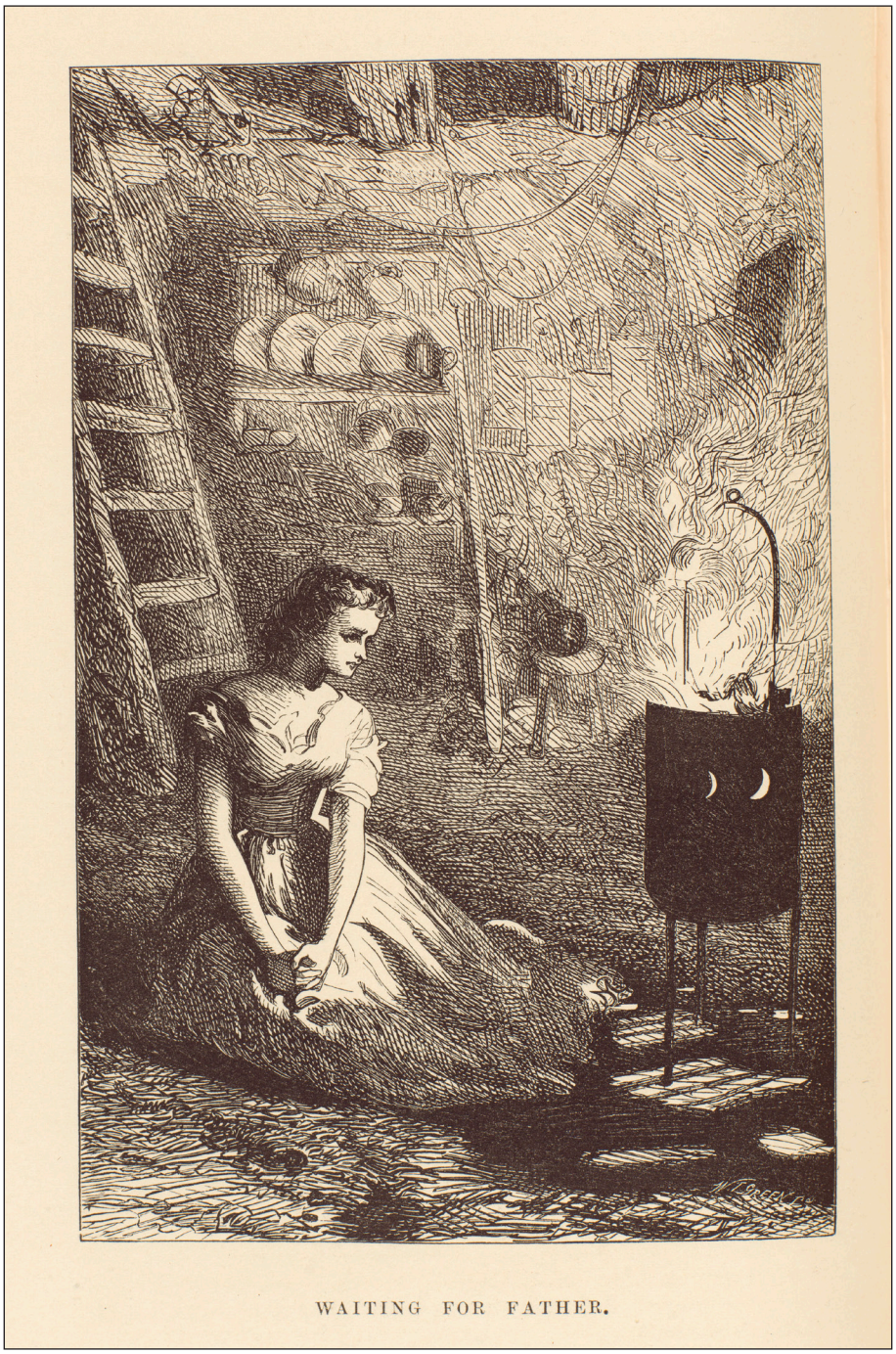

Fig. 3: Marcus Stone, 'Waiting for Father', wood engraving, in Charles Dickens, *Our Mutual Friend*, 2 vols (London: Chapman and Hall, 1865), I, facing p. 124. RB 122456. The Huntington Library, San Marino, California.

The visual effects created by firelight playing on her tears prefigure the incipient cinematic qualities of fire, and Eugene's gaze figuratively transforms the private glow of the domestic coal fire into the glare of a theatre gas lamp, evocative of other theatrical entertainments, including the use of silhouettes on stage and 'shadow shows'.[33] Peering through a glass aperture into an illuminated interior also emulates peep-show entertainments, but I am more interested in how the fire where Lizzie sits 'a-looking' projects the domestic scene onto the windowpane, or through the glass and into the street. The spatial configurations of the scene imitate the image-projection technology of magic lanterns: the coal fire acts as an enclosed flame that then projects Lizzie's image onto or through a glass slide. Stone's illustration replicates the square window frame, working in tandem with the narration to align the reader's gaze with Eugene's. Individual and mass-media consumption converge in this scene through Lizzie's fire-gazing, Stone's illustration, and the narration of Eugene's point of view. Scenes of fireside animation and reanimation in *Our Mutual Friend* reassert the importance of older forms of animation in an era with emerging cinematic technologies, and present print media as a particularly malleable medium for staging overlaps and exchanges across past, present, and future forms of media technologies.

Conclusion

The remediation of fire-gazing continues beyond the nineteenth century, but in ways that evade the teleology of perfection that media archaeologists caution against. For instance, the short 1908 silent film *Fireside Reminiscences* imperfectly remediates fire-gazing as a moving-image technology for projecting memories.[34] Directed by Edwin S. Porter and J. Searle Dawley, the film opens with the scene of a husband and wife who separate after suspicions of her infidelity. A title card with the words 'Three years later'

[33] For more information about shadow shows, see Altick, pp. 117–19.

[34] *Fireside Reminiscences*, dir. by Edwin S. Porter and J. Searle Dawley (Edison Manufacturing Company, 1908). According to Charles Musser, Porter's audiences would have recognized the film as a modified adaptation of a popular song 'After the Ball', an external narrative framework that would have aided interpretation: see Charles Musser, *Before the Nickelodeon: Edwin S. Porter and the Edison Manufacturing Company* (Berkeley: University of California Press, 1991), pp. 411–12. I am grateful to Tom Gunning for recommending this film during a particularly generative conversation at the 2014 Interdisciplinary Nineteenth-Century Studies Conference. For Gunning's interpretation of the film's temporal ambiguities, see Tom Gunning, *D. W. Griffith and the Origins of American Narrative Film* (Urbana: University of Illinois Press, 1991), p. 117.

appears before revealing the same man finishing his dinner alone and kissing his daughter goodnight. Afterwards, he sits in front of his fireplace and a small flutter of light appears just above the logs — a flicker of flame perhaps, or a tendril of smoke — which seemingly expands, or is replaced, when the image of his wife's face is projected into the alcove. Subsequent vignettes from their courtship and marriage dissolve into and out of view, including the confrontation from the film's opening scene. The film relies on the audience's familiarity with fire-gazing as a narrative framework to interpret the series of images as a meaningful sequence. The husband remains relatively motionless, passively absorbing the dissolving views that are framed and collected in the square alcove of the fireplace. As with Lizzie's narration of the Hexam children's past and future, the glowing images shift from the past to the present or near future, revealing the figure of a woman collapsing in the snow outside the house gates. Once the pictures subside, the man's servant enters the room and alerts him that his wife really has collapsed outside, and the film concludes with their reconciliation. The shared architectural iconography of hearth, stage, and screen transforms the fireplace into a repository for a cultural history of the moving image. However, while this particular example of remediation preserves fire-gazing to a certain extent, it also ossifies the former ally of the plastic imagination. Images flicker above the logs, replacing flames with projected cinematic light, and the character's externalized reflections limit the potential for audiences to generate their own individualized memories and associations.

If nineteenth-century gas flames only conjured images of the gas bill before audiences ultimately turned their gazes elsewhere, as Schivelbusch suggests, then twenty-first century audiences are even less likely to lose themselves in dreams of 'primeval fire'. Doing away with the inconveniences of wood and coal fires, modern fireplaces can now rely on gas flames and concrete logs, and homes without fireplaces can repurpose television and computer screens, casting the synthetic glow of digitalized or pre-recorded flames.[35] Porter and Dawley's *Fireside Reminiscences* participates in this turn away from flames and towards screens, and if we were to create a modern retelling of the film, the character's mental pictures would most likely appear on a television screen mounted above the fireplace. Artificial fires on screens may remind us of fire's multisensory properties, but they do not enable the kinetic, aural, tactile experiences that print remediation approximates as we mentally assume the pose of the Firesider while reading Hunt, or sit a-looking with Lizzie Hexam at the pictures that come and go in the hollow down by the flare.

[35] See, for example, *Fireplace 4K: Classic Crackling Fireplace for Your Home*, dir. by George Ford (Netflix, 2015).

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