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Ophthalmoscopy in Charlotte Brontë's *Villette*

Katherine Inglis

Charlotte Brontë's *Villette* (1853) is a hyper-visual novel. It attends to the operation of vision not only within the body of the individual but also within the social body. Criticism of the novel has tended to isolate these two aspects of sight, distinguishing between vision, which is represented as a subjective, phenomenological experience, perpetually shifting, unstable, and impossible to fix; and surveillance, which organizes and imposes discipline within the social body, operating infallibly via the distant, impersonal scrutiny of an oppressive gaze. Paradoxically, the critical interest in these two aspects of vision, particularly surveillance, has obscured the novel's fascination with the *eye*. In what follows, I suggest that an alternative system of scopic control underlies the narrative of *Villette*: a mode of seeing that is intimately related to the dramatic advances in the scientific understanding of embodied sight during the era of the novel's composition. This third system challenges and progressively undermines the surveillance system. One hazard of basing generalizations on the panoptic structure is that we lose sight of the body, particularly the body of the observer, which is usually rendered as the 'disembodied gaze' in critical shorthand. This structure and terminology is unhelpful when trying to navigate *Villette*'s myriad visualities, which have real, physical impact on the bodies (specifically, the retinas) of both observers and the observed. As Christopher Otter has argued in *The Victorian Eye*, a historical study that resists the 'retrospective panopticization of a society that was, historically, not panoptic', the dominance of the Panopticon in nineteenth-century studies, in diverse disciplines, is sustained by critical blindness to the period's manifold competing visual discourses, including ocular physiology, which is 'routinely ignored in both technological and cultural histories of light'.¹ Reading *Villette* with an eye for ocular physiology renders the supremacy of panopticism untenable. The eye, for Brontë, was plainly vulnerable, corporeal, and – if caught in the act of observation – agonized. Surveillance can be a hazardous activity.

Criticism that attends to the novel's interest in the phenomenological experience of sight focuses on the perceptual apparatus of Lucy Snowe, *Villette*'s narrator.² Lucy describes the experience of sensational overload in an unfamiliar, foreign society that bombards her hypersensitive sensorium with impressions and (often contradictory or impossible) information. For example, Heather Glen argues that in contrast to her predecessor, Jane Eyre, whose active, artistic vision enabled her to exert a degree of control over her perception of the world, Lucy is overwhelmed by unwelcome sights that she cannot repel nor comprehend.³ She fails to see or to process visual information, refuses to report that which she does see, or – in the most extreme instances of distorted perception – she describes vivid visual hallucinations. Lucy Snowe, according to the critical history of this novel, is the unreliable narrator *par excellence*. The second critical approach, which emphasizes the operation of surveillance, is concerned less with the reliability of the embodied observer/narrator than it is with the bounded subjectivity of an observed narrator in a panoptic disciplinary society. For instance, in Sally Shuttleworth's analysis of the operation of surveillance in medical, industrial and religious discourse, *Villette* describes 'the ways in which the very experience of selfhood is socially defined'.⁴

It is true that *Villette* is concerned with the fashioning of selfhood in a culture of visual discipline. Lucy defines her English Protestant identity in explicit opposition to a foreign Catholicism that is experienced primarily as an oppressive structure of observation, ostensibly covert, in actuality overt. The novel is set principally in a girls' boarding school (Madame Beck's Pensionnat) in Villette, 'the great capital of the great kingdom of Labassecour'. Villette and Labassecour are fictionalized versions of Brussels and Belgium, where Charlotte and Emily Brontë had attended and taught at such a school in 1842-3.⁵ *Villette* dramatizes a clash of cultures, setting Lucy, the lone champion of self-scrutiny and individualism, against a caricature of Jesuitical surveillance-as-discipline: 'the surveillance of a sleepless eye' (503). This collision is elaborated through a series of encounters between Lucy and *surveillantes*, creating a picture of a society that is governed by surveillance in all its aspects: religious, political, social and domestic. Through Lucy's combative analysis, this ubiquitous visual discipline is characterized as the antithesis of 'Englishness', as when Lucy is first subjected to surveillance in the form of Madame Beck's nocturnal scrutiny of her person and

possessions: Madame's 'taste for research' prompts her to secretly study Lucy's face, turn out her pocket, read her memorandum-book and inspect her property; 'all this', Lucy observes, 'was very un-English: truly I was in a foreign land'(132-3).

As Lucy becomes increasingly familiar with Villettes's social order, the association of surveillance with an 'un-English' identity is reinforced by encounters with the architecture and technology of panopticism. Villettes is composed of observed subjects and *surveillantes*; its architecture creates panoptic spaces where covert surveillance can be practised; its myriad mirrors and glass panels deflect and refract light in such a way that the gaze can rarely be traced back to its origin. The temptation to identify panopticism in *Villettes* is – understandably – strong, and post-structuralist attentiveness to the novel's architecture of power has yielded insightful, inventive scholarship. Critical responses to the operation of surveillance in the novel have located its emphasis on visibility and observation within diverse practices and theoretical models that seek to reveal the subject, such as phrenology, psychoanalysis, and semiotics.⁶ Drawing on Foucault's analysis of Jeremy Bentham's Panopticon as a model for a surveillance system that 'automatizes and disindividualizes power', critics posit that surveillance works in the same way in *Villettes*: possession of the line of sight in itself empowers the *surveillante*; being the potential object of scrutiny in itself ensures the obedience of the subject, just as in Foucault's model 'he who is subjected to a field of visibility, and who knows it, assumes responsibility for the constraints of power' and 'becomes the principle of his own subjection'.⁷ Joseph Boone, for example, argues that the novel's 'circuit of surveillance and voyeuristic delight' foreshadows modern disciplinary society as described in *Discipline and Punish*:

Making sure that those spied-upon *know* that the spying eye has penetrated their inmost secrets becomes a perverse way of consolidating and displaying one's superior powers. [...] Such a society, emerging in the early nineteenth century, maintains its power not by sovereign rule, but by making *each* of its citizens an agent of surveillance and regulation: as we police each other, that is, we internalize the law and become our own policing agents.⁸

In an effort to 'depolice' *Villettes*, Boone cautions that critics must not let 'our excitement over discovering the Foucauldian prisons lurking in so much novelistic discourse' obscure fiction's

dialogical subversion of totalizing systems, yet he remains silent on Lucy Snowe's strident condemnation of *Villette*'s surveillance systems.⁹ Boone collates an impressive range of panoptic forms and surveillance activities in *Villette*, but omits equally significant instances of surveillance's failure noted by Lucy, who – though she may be an unreliable narrator – is an astute critic. Recent scholarship has called for a move away from the Panopticon, to moderate its paradigmatic methodology and attend to the nuances, particularities and multiplicities of alternate, competing visual discourses. As Lauren Goodlad observes, we have tended 'to think more about Bentham than about those who rejected him; more about panopticism than about why it was that nineteenth-century Britains declined to build any Panopticons' and in consequence have paid insufficient attention to 'the difference between the disciplinary subject of Foucault's Franco-oriented and presentist genealogy, and the modes of character idealized by and produced in Britain's self-consciously liberal society'.¹⁰ In criticism of *Villette*, this bias manifests as inattention to the novel's painstaking anatomization and deconstruction of the surveillance system. Surveillance does not operate quite so simply, nor so effectively, in *Villette* as in Foucault's system, nor can the Panopticon be merged seamlessly with the Pensionnat. Through Lucy's gradual disenchantment with the disciplinary order, Brontë exposes surveillance as a fallible, ineffective method of control, a 'hollow system', to use Lucy's phrase (158). As the surveillance system is hollowed out, its place is taken by a system of scopic control focused on the vulnerable retinas of both observed and observing subjects.

Written and published in the early 1850s, *Villette* participates in the decade's reassessment of the human eye. Advances in optical technology and the understanding of physiology contributed to a gradual reconfiguration of the eye through the 1850s. In the light of contemporary discoveries in microscopic, macroscopic, and spectral extremes the human eye was recast as a relatively unresponsive organ, imperfect in design, inherently astigmatic, and of restricted acuity.¹² It is unsurprising that Brontë should have been sensitive to this shift: myopic, fearful of losing her sight, and silent observer of the extraction of her father's cataracts, she was acutely aware of the fragility and fallibility of the human eye.¹³ Given the reconfiguration of sight in mid-Victorian Britain, *Villette*'s surveillance system rests on unstable foundations. This essay seeks to emulate Lucy

Snowe's acuity and see through the surveillance system, to take *Villette*'s visual exchanges back to the corporeal eye of an active, designing, embodied subject. This entails confronting the novel's painfully vivid representation of optical conflict, in which the observer is a sadistic adversary and the human retina a point of vulnerability. Visual exchanges are related not in the disembodied abstractions of panopticism, but with a violent lexicon derived, in part, from the novel terminology of ophthalmoscopy. To see is to risk being 'pierced' (423), 'struck' (201) and 'transfixed through [the] very pupil' (411). Sharp instruments and aggressive looks inflict agony, catching, spearing and puncturing vulnerable eyes. Yet paradoxically, pain ultimately proves liberating, enhancing rather than impairing the agency of the beset object of scrutiny. Various innovations in the 1850s, beginning with the invention of the ophthalmoscope, contributed to the rapid expansion of the discipline of ophthalmology, making possible new methods of examination, operation, and rectification of sight-loss. Surgery could be agonising, but ultimately, by restoring or improving sight, it restored and enhanced freedom. By reading beyond the Foucauldian model of surveillance and attending to the technology of ocular physiology, *Villette*'s optical conflict can be reappraised. The novel puts forward a remedial medical narrative that equates clarity of perception with freedom. The process of acquiring clear sight and agency is organized around three devices designed respectively to look into, perforate, and enhance the human eye: the ophthalmoscope, the stylet, and spectacles.

I: Surveillance – The Hollow System

In her influential analysis of corporeal sight in *Villette*, Heather Glen has demonstrated the effect on the novel of Brontë's visit in 1851 to the Great Exhibition with Sir David Brewster, the eminent authority on optics. Brontë found Brewster a congenial and lucid guide who 'gave information in the kindest and simplest manner', but her letters also emphasize her inability to comprehend this 'marvellous, stirring, bewildering sight', so 'strange new and impossible to describe'.¹⁴ By drawing a parallel between Brontë's recollection of sensory overload and the representation of sight in *Villette*, Glen contends that 'the image recurs of the eye less as organizing than as simply receiving

impressions, of a world that baffles, bewilders, dazzles, strikes'.¹⁵ Brontë's embodied observer is overwhelmed by the volume and variety of information presented to her perception, unable to respond, able only to receive:

And that sense of the perceiver's passivity implicit in such descriptions is underlined elsewhere by an emphasis – both metaphoric and literal – on the physiology of perception. Lucy speaks not of impersonal overview, but of partial, corporeal vision, and not of visual agency, but of defencelessness in the face of an impinging phenomenal world. [...] The sense, is indeed, often, of an aggressive assault on the eye.¹⁶

Sight in *Villette*, Glen argues, signifies 'fixity, rather than freedom; a peculiar, painful passivity, rather than pleasurable choice and control'.¹⁷ By taking Glen's analysis as a foundation and a point of departure, I will qualify her insistence on Lucy's passivity, but elaborate on her insights into aggressive dazzle and corporeal sight in the context of contemporary innovations in eye surgery and optics. That impinging phenomenal world, striking upon Lucy's hypersensitive retina, produces not just pain, but optical agony; yet rather than remaining passive under these assaults, Lucy becomes a reluctant combatant, learning to value the pain evoked by dazzle as a way of resisting the numbing effects of surveillance.

Glen has noted the prominence of visual aids and prostheses in the text, which are often employed to enable covert surveillance at the Pensionnat.¹⁸ Indirect lines of sight are maintained across great distances, through surfaces and at impossible angles, transcending the limits of organic perception. Madame Beck uses a 'reflector' (163) to see round corners and monitors Lucy through a 'spy-hole' (144); Monsieur Paul Emanuel, Madame's cousin and the second authority in the school, uses a 'glass' (455) to monitor the pupils and teachers in the Pensionnat's garden. For Foucault, discipline is strengthened by distance:

The external power throws off its physical weight; it tends to the non-corporeal; and, the more it approaches this limit, the more constant, profound and permanent are its effects: it is a perpetual victory that avoids any physical confrontation and which is always decided in advance.¹⁹

This is where the mapping of the Pensionnat onto the Panopticon breaks down. Lucy realizes that distance disadvantages the observer, though in her early career she is seduced by the apparent power of the *surveillante*'s position:

Thus did the view appear, seen through the enchantment of distance; but there came a time when distance was to melt for me, when I was to be called down from my watch-tower of the nursery, whence I had hitherto made my observations, and was to be compelled into closer intercourse with this little world of Rue Fossette. (138)

Brontë conflates the *surveillante*'s watch-tower with the nursery. Her *surveillante* is not the empowered observer in the Panopticon's tower. To survey from a distance disempowers the detached observer, reducing her to an infantile position.

As a purely visual practice, *Villette*'s supplemented surveillance is mostly successful, but as a method of social control it proves a wholly ineffective 'hollow system' (158). Through his glass, Paul sees pupils stealing fruit, Madame Beck stalking Lucy, and Zelie's secret impropriety – but no punishment follows, and no-one realizes that they have been seen. Nor do the prisoners of this Panopticon care if they are observed. Paul scorns the system after he is caught rifling Lucy's desk: 'Do you think I care for being caught? Not I' (432). Madame Beck, who at first seems so powerful, is soon shown to be a rather impotent threat, at least as a *surveillante*. As Sandra M. Gilbert and Susan Gubar noted, surveillance is called into question by Madame Beck's inability to restrain either her delinquent daughter Désirée, the alcoholic teacher 'Madame Svini', or Ginevra Fanshawe, who conducts a secret love affair, eventually escaping to get married.²⁰ Madame Beck relies on 'd'une surveillance toute particulière' (a most particular surveillance) to control Désirée, but fails to follow the detection of crime with punishment (158). Lucy's verdict on Madame and her system is damning: 'Surveillance must work the whole cure. It failed of course' (158). Désirée knows that no real consequence succeeds detection and so continues to misbehave. Madame Beck's power as a 'first-rate *surveillante*' is undermined further when Ginevra and Lucy evade her to spy on the male guests at the Pensionnat ball (213). Ginevra declares 'we shall be scolded if we are seen, but never mind' (216). In matters as trivial as spying on young men or rifling a desk, and in ones as serious as an elopement, the

threat of discovery alone is an ineffective deterrent and the *surveillante* a rather deluded tyrant. The supplemented *surveillante* operates at a distance from the observed subject – a fact which the observed subjects exploit. There is always time to escape or adopt an innocent expression. The result is the mere illusion of order.

II: Ophthalmic Conflict – Gazing into the Living Interior

Villette gradually exposes surveillance as a hollow system of discipline, fatally undermined by its reliance on two false premises: that distance empowers the observer; and that observation compels the observed to modify their behaviour. Surveillance, as Lucy eventually realizes, effects only superficial modifications. When this is exposed, the disciplinary order maintained by surveillance collapses. Its place is taken by an alternative model of visual discipline founded on the weakness of the corporeal eye that effects radical modifications in behaviour, attitude and identity. In contrast to surveillance, this practice is conducted in confined spaces where gazer and victim share an unobstructed view of each other. Proximity produces instant, cataclysmic crises. This alternative method of visual control may well be derived from the objects and practices associated with ophthalmology, which emerged as a distinct medical discipline in the first half of the nineteenth century. Europe's first eye hospital was founded in Vienna in 1768; in 1805, the London Dispensary for Curing Diseases of the Eye and Ears opened (later renamed the Royal London Ophthalmic Hospital, now Moorfields Eye Hospital) followed by ophthalmological institutions and departments throughout the country; the first major English-language textbooks on ophthalmology were published in the 1830s, and ophthalmology journals appeared in the late 1850s.²¹ Perhaps the most important factor in the establishment of ophthalmology as a discipline was Hermann von Helmholtz's invention of the 'Augen-Spiegel', now known as the ophthalmoscope, in 1850 (see Fig. 1). The publication of *Beschreibung eines Augen-Spiegels (A Description of an Eye-Speculum)* in October 1851 (contemporary with the writing of *Villette*) precipitated a revolution in ophthalmology.²² For the first time, medical practitioners could look into the interior of the living eye; the mysterious eye diseases

referred to as ‘black cataract’ would no longer be ‘*terra incognita*’, Helmholtz wrote.²³ Since we live in an age in which imagery of the bodily interior is commonplace and the ophthalmoscope as familiar as the stethoscope, it is easy for us to miss Brontë’s poetic, innovative depiction of ophthalmology and examinations of the living retina. In the ‘direct’ method of ophthalmoscopy (see Fig. 2) the examiner is close to the patient, looking at a virtual, upright, highly magnified image of the patient’s fundus (literally, the bottom of the eye; the part of the interior of the eye opposite to the pupil). Helmholtz preferred this method to the ‘indirect’ method introduced by Theodor Ruete in 1852, in which the examiner uses a lens to view a real, inverted panoramic image of the fundus, sitting at a distance from the patient rather than gazing directly into the interior of the eye.²⁴ The direct method’s proximate, illuminated, intimate relation between ophthalmologist and patient sets the paradigm for visual relations in *Villette*.

It had long been known that the eye was not luminescent, but investigations in the 1820s by Jan Purkinje and by William Cumming and Ernst von Brücke in the 1840s had shown that eyes could appear luminous if the observer was in a position to intercept rays reflected from the subject’s fundus.²⁵ This observation anticipated the first operating principle of the ophthalmoscope, which is that both patient and observer must be ‘emmetropic’, so that ‘a point of focus on the retina of the patient would emanate from the eye in parallel rays of light and focus on the retina of the observer’.²⁶ Emmetropia characterizes the perfect eye: because the retina is positioned precisely at the eye’s focal point, rather than behind (hypermetropia) or in front of it (myopia), light rays focus correctly. In addition, the patient’s retina must be illuminated, and the light source and the observer’s pupil must be aligned.²⁷ Helmholtz realized that light emitted from the pupil follows the same course it took in entering the pupil, returning to its source, so that to obtain an image of the patient’s fundus ‘he had only to devise an instrument by which his own eye could be placed in line with the rays of light that were entering and leaving the observed eye’, without interrupting the incident rays.²⁸ His elegant, simple design uses three plates of glass, which act as lenses *and* mirrors, to enable the examiner to receive light rays emitted from the interior of the subject’s eye (see Fig. 3). Helmholtz reported his ‘great joy’ at ‘being the first who saw before him a living human retina’.²⁹

Although the ophthalmoscope's practical applications were appreciated immediately, it had vocal detractors. A colleague warned Helmholtz that 'it was dangerous to admit crude light into diseased eyes'.³⁰ Similar attitudes were articulated in Britain and America in the early 1850s.³¹ James Dixon, surgeon at the Royal London Ophthalmic Hospital, admitted that the device had proved its value, but cautioned that 'the searching glare of the Ophthalmoscope' might aggravate incipient conditions:

So much has lately been written about the value of the Ophthalmoscope as a means of detecting *incipient* disease of the retina, that the student must be warned against the irreparable mischief he may inflict upon an eye, in which vision is only slightly impaired, by subjecting it to an intense glare of concentrated light. [...] Until the observer has thoroughly satisfied himself that [the cornea and lens] are transparent, let him not subject the retina to the possibly irritating effects of concentrated light.³²

Excessive illumination might dazzle the retina and cause sight-loss, much as staring at the sun to study retinal afterimages had permanently impaired the vision of Brewster and other optical investigators.³³ *Villette* imagines this unpleasant scenario, in which observer and subject adopt the position of examiner and patient, gaze into each other's eyes, and are mutually endangered: proximate sources of illumination dazzle the subject's weak eyes, or light rays emerge from scrutinized eyes and wound the observer's retina. As we shall see, it is as if Brontë has coupled the ophthalmoscope to a 'burning-mirror', a convex lens which collects light rays dispersed over its surface into a focal point, producing a single ray of great intensity. In 1851-52, there would have been a logical etymological association between Helmholtz's device and mirrors. C. Wilbur Rucker has noted that 'Augen-spiegel' proved a troublesome term in England and France in the early years of ophthalmoscopy: various translations were tried, including 'miroir oculaire' (eye mirror) and 'eye speculum', an ambiguous name, suggestive both of a device to reflect light and one to dilate the pupil; 'ophthalmoscope' was not used in Britain until September 1853.³⁴ An allusion to burning-mirrors is encoded in *Villette*'s enigmatic title. Villette, the capital city of Labassecour, can be translated as 'little town', and is usually held to be a sardonic jibe at the expense of Brussels, while Brontë's

venom is even more apparent in the nomination of Belgium as Labasseccour, which translated literally, means ‘low court’, but is commonly understood to mean ‘barnyard’ or ‘pig-sty’.³⁵ However, another dimension is brought to these insults to Belgium and Brussels by the allusion to burning-mirrors. In both the *Treatise on Optics* and the *Edinburgh Encyclopaedia*, David Brewster had described the destructive power of the burning-mirrors manufactured by François Villette.³⁶ Brewster explained in his *Treatise on Optics* that the burning-mirror’s focal point was known by the evocative name ‘*fire-place*, because the rays thus collected have the power of burning any inflammable body placed there’.³⁷ A Villette mirror tested at Whitehall in 1718 melted an eccentric selection of substances: coins, tin, cast iron, emerald, diamond, slate, bone and a piece of Pompey’s pillar. In *Jane Eyre* (1847), Brontë had turned to burning-mirrors to convey Jane’s agony under the scrutiny of a classroom when unjustly accused of lying: she recalls that she ‘felt their eyes directed like burning-glasses against my scorched skin’ (98).³⁸ Light proves just as destructive in *Villette*.

Brontë imagines the reception of light rays from another person’s eyes to be devastating, the exchange of glances an act of distressing intimacy. Perhaps Brontë was familiar with Brewster’s account of light as a corporeal particle, for luminous gazes are imagined to possess material properties and exert physical pressure upon receptive retinas.³⁹ The victim’s eye is a point of weakness, the pupil a vulnerable aperture, the retina a target. It is all too easy to sustain permanent retinal damage, as Lucy appreciates: she avoids looking at Dr John because ‘I value vision, and dread being struck stone blind’ (520). Her fear is realized when Paulina’s acute perception is damaged by proximity to the dangerously attractive doctor: ‘cloudless happiness had dazzled her native clear sight’ (520). Ginevra Fanshawe’s malicious glances at Dr John during the fête become ‘shafts’ and ‘arrows’, so that Cupid’s arrows are optical weapons (210). Brontë takes the familiar motif of blind love and restores the barb to the cliché.

Lucy is always conscious of the hazards of looking unguardedly. To look into another’s eyes endangers both observer and observed, placing them in the position of the ophthalmologist and the patient: both risk receiving into their bodies rays emitted from the other. To share a look is an exchange almost as intimate as touch. It is because of the fear of having to look into Madame Beck’s

eyes that Lucy never confronts her in her repeated, fruitless acts of espionage, her systematic searching of Lucy's belongings for evidence of non-existent love-affairs: to do so would bring 'catastrophe' (186):

There would have been nothing for it then but a scene, and she and I would have had to come all at once, with a sudden clash, to a thorough knowledge of each other: down would have gone conventionalities, away – swept disguises, and *I* should have looked into her eyes, and *she* into mine – we should have known that we could work together no more. (186)

The intimate look is more potent, dangerous and destructive than that of the *surveillante*. Surveillance is used to police the Pensionnat, to maintain order, or if not order then at least the semblance of propriety; wider society is policed by the 'surveillance of a sleepless eye', the monitoring gaze of the confessor (503). Both prove ineffective, unable to withstand the destructive, transformative effect of this proximate gaze. The polite conventions established and maintained by the surveillance system are swept away 'all at once' by catastrophic energy.

III: The Stylet – Impression and Inscription

The shared look is painful emotionally and physically, felt almost literally as an impression upon the retina. In her last desperate attempt to separate Paul and Lucy, Madame Beck looks directly into Lucy's eyes and wounds her:

'Come, Paul!' she reiterated, her eye grazing me with its hard ray like a steel stylet.

[...] Pierced deeper than I could endure, made now to feel what defied suppression, I cried –

'My heart will break!'

What I felt seemed literal heart-break. (580)

Lucy's emphasis on the literality of this pain stresses the physical impact an apparently immaterial gaze has upon the body. The gaze is as solid and sharp as a 'stylet'. The word derives from stiletto,

and like the slim dagger, stylets pierce and perforate. Nineteenth-century surgical instrument catalogues refer to fine probes called variously stylets, stilettes, and styles, which were used to stop the seepage of fluid from lacrimal fistulas (abscesses of the tear-duct, referred to in the nineteenth century as *fistula lachrymalis*), as in this description from Joseph-François Malgaigne's *Manual of Operative Surgery* (1846):

Ware accidentally observed that when a metallic stylet is placed in the canal, the overflow of tears almost immediately ceases [...] His stylet is a metallic wire about an inch and a quarter long, straight in almost all its extent, but curved at its upper part at an obtuse angle. The inferior end, very long, is intended to occupy the duct; the superior is only two lines long, and terminates by a circular flat head about two lines in diameter. When the stylet is placed, its superior branch rests in the course of the incision made into the lachrymal sac, and its flat head covers and masks the external wound. [...] The patient wears it all his life.⁴⁰

Fig. 4 shows a plate of instruments used for operations on lacrimal fistulas: the instruments numbered 9, 10, 16, 17, and 18 constitute the different elements described above. Malgaigne stressed that the stylet had to be manipulated with great care when probing the lacrimal passages. He directed surgeons to hold the stylet 'as a pen' when introducing it to the body, a phrase that connects with another sense of 'stylet', a type of writing instrument used by the blind to write.⁴¹ In the second half of the nineteenth-century, 'stylet' could also mean a tool for engraving. Indeed, the *OED* cites *Villette* as the first instance of this usage. However, given the prominence of optical damage in *Villette*, it seems appropriate to connect Brontë's stylet to both surgery *and* inscription. As a probe the stylet enabled the physician to penetrate the surface of the body; as a graving instrument it enabled the writer to inscribe text. Thus a stylet gaze signals the wielder's intention to pierce and write upon the body of the victim, to impress their will onto a receptive substance.

Optical assaults leave permanent legible marks upon the body as text or decipherable pictures. Dr John's letter leaves a 'printed' impression on 'the retina of an inward vision' (318); Paul's 'picture' is 'printed upon' Lucy's brain (579). Praising Dr John's handwriting, Paulina comments on the absence of 'pointed turns harshly pricking the optic nerve' (464). Visual impressions are violently

inscribed upon and within the body as if carved by a metal stylet. When Paul examines Lucy after their encounter with Madame Beck, he detects the ‘signature’ of such an instrument:

‘Well,’ said he, after some seconds’ scrutiny, ‘there is no denying that signature:

Constancy wrote it, her pen is of iron. Was the record painful?’

‘Severely painful,’ I said, with truth. ‘Withdraw her hand, monsieur; I can bear its inscribing force no more.’ (583)

Similarly, Lucy detected ‘strong hieroglyphics graven as with iron stylet’ on the King’s face, declaring ‘Hypochondria’ to be the author (290). Given the body’s susceptibility to the impress of the stylet gaze, it is unsurprising that Lucy cultivates privacy and scrupulously avoids scrutiny. Yet her avoidance strategies only modulate the methods she used when still enchanted by surveillance, rendering her inconspicuous rather than openly challenging the surveillante’s power or the dangerous glance. She still fears to look into Madame Beck’s eyes and shatter the system. The prompt for revolution comes from elsewhere, from the most adept practitioner and saboteur of Villette’s twin systems of optical control, Paul. He wears a fitting symbol for his role as a double agent –his ambiguous spectacles.

IV: Transfixed by the Lunettes

Glen observes that Paul’s ‘terrifying, vulnerable “lunettes”’ have a dual function, symbolising ‘defective vision’, and as a ‘metonymic detail’ figuring Paul himself.⁴² This metonymic function is emphatically marked. Paul is introduced as ‘a small, dark and spare man, in spectacles’, almost subordinate to his eyewear (128). He is blended with his spectacles from the first, so that his physiognomic reading of Lucy seems to have been conducted by his glasses; ‘The little man fixed on me his spectacles [...] he meant to see through me’ (128). Similarly, Rosine projects her fear of Paul onto his glasses, declaring that ‘Monsieur’s lunettes are really terrible’ (410). Lucy treats the glasses

as antagonists, confessing that she ‘could have exulted to burst on his vision, confront and confound his “lunettes”’ (442-43). The glasses’ power resides in their liminality. They represent Paul’s unique ability to move between systems of optical control, to survey and withstand surveillance, to dazzle without fearing that his look might be returned, to see *through* as well as survey. Even though, like Paul, they are destroyed, they (also like Paul) gesture toward a way through *Villette*’s optical warfare.

The inelegant predecessors of Paul’s lunettes are William Crimsworth’s glasses in *The Professor* (1857). *The Professor*, Brontë’s first novel, was published posthumously. It has often been treated as an inferior proto-*Villette*, for its setting and aggressive visual exchanges anticipate the later work. Crimsworth, like Lucy, is an English Protestant teacher immured in a hostile Catholic Pensionnat. Recent criticism however, has sought to reclaim *The Professor*. Glen reads it as a perceptive critique of the discourse of self-help.⁴³ William A. Cohen’s analysis of corporeal vision in *The Professor* unfolds its unsettling, sometimes unpleasant emphasis on the permeability of the body. Cohen’s analysis attends to the mutual vulnerability of observer and observed in a way that is precluded by panoptic readings that insist on the incorporeality of sight: corporeal sight appropriates vision to ‘senses that eliminate the distance between subject and object’ (smell, taste, and most dangerously, touch) and ‘thereby redound as much on the agent as on their object’.⁴⁴ The embodied gaze renders both observer and observed subject to the same field of perception and sensation, so that, potentially, ‘sight itself is a means of egress and contact’.⁴⁵ Crimsworth’s myopia, Cohen points out, ‘impedes the lure of disembodied surveillance’.⁴⁶ However, the technological remedy for myopia, glasses, serves to deflect the embodied gaze. Like Paul, Crimsworth uses his ‘bésicles’ (an archaic term for glasses) to reclaim his authority. Surprised by an unexpected visitor who has assumed a degree of intimacy which he finds irritating, Crimsworth uses his glasses to re-establish distance:

I wiped the glasses very deliberately, and put them on quite as deliberately; adjusting them so as not to hurt the bridge of my nose, or get entangled in my short tufts of dun hair. I was sitting in the window-seat, with my back to the light, and I had him *vis-à-vis*; a position he would much rather have had reversed; for, at any time, he preferred scrutinizing to being scrutinized. [...] Being in no hurry to address him, I sat and stared at my ease.⁴⁷

The bécicles restore order, setting the *surveillant* at a distance, acting as shields as well as optical aids. They both augment and baffle sight, two functions that are fully exploited by Paul in *Villette*. However, Crimsworth's elaborate performance with the bécicles also points to a potential capacity for harm, an anxiety which is developed in *Villette*. Crimsworth's precautions when donning his glasses are intended principally to irritate his visitor, but in *Villette* glasses are genuinely dangerous objects.

Paul's glasses supplement and enhance surveillance and retinal attack. Their power is demonstrated in Paul's ability to see through surfaces and catch Lucy in supposedly compromising positions: flirting with Dr John, looking at salacious paintings, savouring a love letter:

The closed door of the first classe – my sanctuary – offered no obstacle; it burst open, and a paletôt, and a bonnet grec filled the void; also two eyes first vaguely struck upon, and then hungrily dived into me. (201)

Piercing the same wall, and close beside the stove, was a window, looking also into the carré; as I looked up a cap-tassel, a brow, two eyes filled a pane of that window; the fixed gaze of those two eyes hit right against my own glance: they were watching me. [...] It was very much his habit to wear eyes before, behind, and on each side of him: he had seen me through the little window – he now opened the refectory door and there he stood. (310)

The bespectacled Argus is the most efficient spy in *Villette*. Paul's sight is characterized differently to the distant, emotionless, monitoring gaze of the novel's female *surveillantes*. The 'male spy' always pursues that which he detects, closing on his prey to admonish or praise, so that in contrast to Madame Beck's system, consequence follows detection (310).

He followed footprints that, as they approached the bourne, were sometimes marked in blood – followed them grimly, holding the austere police-watch over the pain pressed pilgrim. And when at last he allowed a rest, before slumber might close the eyelids, he opened those same lids wide, with pitiless finger and thumb, and gazed deep through the pupil and the irids into the brain, into the heart. (438)

Paul crowns the method of the detective with that of the newly-created ophthalmologist, closing the distance between the observer and the scrutinized patient/victim to penetrate the eye and look into the living interior of the subject.

Paul's visual practices are described with a lexicon of perforation which overlaps with that of the stilet: his gaze 'hungrily dived into' Lucy (201), his 'basilisk attention' is directed according to 'the terrible unerring penetration of instinct, and pierced in its hiding-place the last lurking thought of the heart' (423); he levels 'unspeakable looks' through his 'dart-dealing spectacles' (409), and fixes on Lucy 'a vigilant, piercing, and often malicious eye' (442). Paul's gaze establishes a connection with the observed subject, penetrating her surface, yoking her (willing or not) into an intimate exchange so that his gaze has to be returned.⁴⁸ Madame Beck aims not to be detected in acts of surveillance, but Paul's idiosyncratic gaze hits 'right against' that of the observed subject in an antagonistic challenge (310). When Lucy attempts to spy on him, he trumps surveillance with retinal assault, pinioning the audacious *surveillante*'s eye through her defenceless pupil:

Twice did I enjoy this side-view with impunity, advancing and receding unseen; the third time my eye had scarce dawned beyond the obscurity of the desk, when it was caught and transfixed through its very pupil – transfixed by the 'lunettes.' Rosine was right; these utensils had in them a blank and immutable terror, beyond the mobile wrath of the wearer's own unglazed eyes. (411)

The image of Lucy's hypersensitive eye caught by its pupil is almost too vivid. The glasses operate more like an amplified ophthalmoscope than corrective lenses, concentrating the intensity of Paul's perforating gaze to an unbearable degree of sharpness that enables him to penetrate into the interior of the would-be *surveillante*'s eye.

Paul's glasses also protect him from attack, presenting a 'blank' surface which resists intrusion or interrogation. Nineteenth-century ophthalmic literature had much to say about the value of glasses as preservers of sight. Not only would they improve weak sight, they could protect healthy eyes from domestic dangers: tallow candles, bright white paper, and reading at night were all potential

hazards to the vulnerable retina.⁴⁹ Over time, one guide on glasses warned its readers, the effect of light hitting the red damask hangings of first-class rail carriages would produce ‘*éblouissement très pénible*’, a painful dazzling effect, thus coloured protective glasses were deemed indispensable for railway travellers.⁵⁰ Glasses impart an almost unsurpassable advantage, for they are weapons as well as shields, baffling both surveys and hostile looks. Lucy avoided Madame Beck’s gaze for fear of destroying their precarious truce, but she could not have looked past Paul’s glasses, even had she dared. Paul’s glasses are more than prosthetic remedies for weak sight: they are technological enhancements which render him impervious to the two visual systems of control and punishment. Armed with his baffling lunettes, Paul spies more efficiently than Madame Beck, controls the Pensionnat with his terrible, agonising gaze, and ultimately outwits the surveillance system to buy Lucy a future.

Yet it must be acknowledged that Paul’s glasses also reflect his vulnerability. The price of extreme long-sight is that one cannot see what is close. Being of a peculiar prescription, the glasses overcompensate for Paul’s short-sightedness, giving him a telescopic gaze that functions superbly at a distance but poorly for close work. Proximity neutralizes the lunettes:

I now found the advantage of proximity: these short-sighted ‘lunettes’ were useless for the inspection of a criminal under Monsieur’s nose; accordingly, he doffed them, and he and I stood on more equal terms.

I am glad I was not really much afraid of him – that, indeed, close in his presence, I felt no terror at all. (411)

Without his glasses, Paul is Lucy’s equal – and he and his glasses are unsafe. His will and his glasses break together, leaving him tractable and ‘graciously pliant’ (413):

The light steel-framed ‘lunettes’ [...] fell to the estrade [...] they so fell that each clear pebble became a shivered and shapeless star. [...] I knew the value of those ‘lunettes:’ M. Paul’s sight was peculiar, not easily fitted, and these glasses suited him. I had heard him call them his treasures: as I picked them up, cracked and worthless, my hand trembled. [...] ‘*Là!*’ said he:

‘me voilà veuf de mes lunettes! [‘there I am, widowed of my glasses!’] [...] You are resolved to have me quite blind and helpless in your hands!’ (413)

The shattering of the lunettes is not only a material loss (prescription glasses were expensive items) but also indicates a shift of power in Lucy and Paul’s relationship.⁵¹ ‘Pebble’ glasses like Paul’s were clear as glass yet extremely hard and durable, so were recommended by oculists as ‘not so liable to break with a slight blow or accident’.⁵² Yet Lucy manages this feat. Deprived of his optical enhancers, Paul declares that ‘he dared not but obey one who had given such an instance of her dangerous prowess’ (413). Armed with replacements, Paul becomes cantankerous again: his ‘lunettes being on the alert, he gleamed up every stray look; I don’t think he lost one: the consequence was, his eyes soon discarded a screen, that their blaze might sparkle free’ (417).⁵³ Yet the shattering of the lunettes has revealed that Paul can be dazzled by Lucy. The chapter concludes with Lucy’s realization that she has become luminous: ‘it is a new thing to see one testily lifting his hand to screen his eyes, because you tease him with an obtrusive ray’ (421). The shattering of the lunettes and the resultant temporary liberation prefigure Lucy’s eventual transcendence of *Villette*’s twin systems of optical control.

V: From Spectral Vision to Clarity

Ultimately, Lucy nullifies surveillance and optical assault by surviving their application. She braves a direct confrontation with Madame Beck, presenting herself for the scrutiny of the stylet gaze. Stylets are used to stem the flow of tears, but Madame’s inexpertly wielded gaze releases a long-dammed flood. Heart-break is succeeded by the breaking of the ‘seal of another fountain’, and ‘with relief’, Lucy weeps (580). Her tears bring Paul to her defence. Subjected to one last ophthalmological inspection – ‘he consulted my eyes with a most piercing glance’ (591) – she declares her jealousy of Justine Marie, which elicits Paul’s declaration of love. The infantile security of the *surveillante* was only a virtual life; by exposing her retina to optical pain Lucy discovers the agony but also the

pleasure of embodiment. Her experience and testimony of pain bring the pleasure of Paul's protection, one blissful afternoon and three years of happiness.

Lucy's revolution recalls Brontë's father's recovery after cataract surgery, an experience that influenced the end of *Jane Eyre*. The Reverend Brontë's blindness had made him increasingly dependent on his children. In the immediate aftermath of the cataract extraction he was reduced to an almost infantile condition, but recovered his independence as his sight improved. Following 'the advice of an eminent oculist', Rochester eventually recovers sight in one eye, which restores his independence so that 'he can find his way without being led by the hand'.⁵⁴ Pain brings clarity, transparency supersedes opacity, and intervention restores agency. When Lucy awakes at La Terrasse following a nervous collapse, optical distress is a precursor to her engagement with the world beyond the Pensionnat. La Terrasse is the home of Lucy's godmother, Mrs Bretton, with whom she had lost contact in England. She is brought unconscious to La Terrasse to be tended by Mrs Bretton's son, Graham, who is also 'Dr John', the attendant physician at the Pensionnat. Initially, she finds it impossible to distinguish between classes of objects:

At first I knew nothing I looked on: a wall was not a wall – a lamp not a lamp. I should have understood what we call a ghost, as well as I did the commonest object; which is another way of intimating that all my eye rested on struck it as spectral. (237)

Brewster had noted a similar phenomenon when supervising the display of gems at the Crystal Palace, for he found that spectators could not distinguish between the great Koh-i-Noor diamond and the hollow foil of its case:

In the spectra produced by broad luminous spaces, all the colours are recombined into white light, and hence the disappointment which every person has experienced at the first sight of these singular gems. [...] It would have been desirable to place all the diamonds (as the Koh-i-Noor is on Fridays and Saturdays) in a dark apartment illuminated by numerous small and brilliant lights. Till this was done with the Koh-i-Noor, nobody had any idea of its purity and beauty, and indeed no-body till then could say that it was not a piece of glass.⁵⁵

Precious diamonds are indistinguishable from glass. This defamiliarization of the visual field touches the experience of the cataract patient, blind from birth, whose sight is restored by surgery: at first, the patient cannot process visual information.⁵⁶ Having researched cataract surgery for her father, Brontë would have been familiar with William Cheselden's famous account (published in the *Philosophical Transactions of the Royal Society* in 1728) of a patient's perceptual disorientation following couching (i.e. depression of the cataract). The thirteen-year-old boy reported disorientation similar to Lucy's. Cheselden noted that never having learned depth perception, the boy 'was so far from making any Judgment about Distance, that he thought all Objects whatever touch'd his Eyes (as he express'd it) as what he felt, did his Skin' and was unable to understand two-dimensional representations of three-dimensional objects.⁵⁷ Lucy's disorientation, like that of Cheselden's patient, is an intermediate stage between blindness and comprehension. Optical confusion is succeeded by a sequence of revelations as opacity becomes transparency: Lucy reveals her identity to Mrs Bretton, Dr John is revealed to be Graham, and a beautiful stranger is revealed to be Paulina Home, who had lived with Lucy and the Brettons as a child. Things come back into focus, like the Koh-i-Noor in a darkened room. This pattern in which revelation succeeds optical distress is repeated in the aftermath of Lucy's ordeal under Madame Beck's stylet gaze. It is as if a cataract has been lacerated, allowing her to reinterpret the shadows and indistinct figures that had distressed her as a surveillante: Lucy's supposed rival is Paul's god-daughter, and Paul's real secrets are his love and Lucy's school. 'Seeing' these realities, Lucy is free to act, build a career and write her narrative.

Optical intervention is agonising but produces clear sight. Paul is the principal emblem of this visual practice, a merciless autocratic ophthalmologist who brings pain but also palliation. Named after the saint who was blinded then saw truth, Paul wounds the eye to bring clarity. His mind, Lucy confesses, is like 'collyrium to the spirit's eyes' (collyrium was a traditional remedy for eye-strain): perusing his 'tomes of thought', her 'inward sight grew clear and strong' (472). Metonymically associated with his lunettes, Paul remedies Lucy's limited, bedazzled vision; metonymically associated with the ophthalmologist, Paul's intrusive, intimate practices are a necessary precursor to the restoration of sight. In *Villette's* final paradox, optical assault restores clarity, and agony forces

agency. The study of ophthalmoscopy in *Villette* reveals a narrator who has been tried severely by the optical ordeal, whose suffering has been vividly represented without the solace of the rhetoric of improvement, whose tale ends in loss. Nevertheless, the enigmatic conclusion permits (just enough) freedom for an interpretation that traces a developmental narrative from infantile *surveillante* to battle-hardened survivor. *Villette* ends with a devastating storm that has (or, perhaps, has not) overwhelmed the ship bringing Paul back to Lucy. Lucy does not tell us. 'Here pause: pause at once. There is enough said' she insists, withholding narrative closure one last time (596). The onus falls instead on the reader, who must make a conscious choice between interpretations; so 'let sunny imaginations hope' indeed (596), but for the survival of Lucy's agency, not the return of the bridegroom. Rather than closing down its narrative, *Villette*'s conclusion extends the novel's horizons, shifting focus from the anticipated but never-to-be fulfilled return of the liberator to the expansive perception of the narrator. In the aftermath of her optical ordeal, Lucy sees with brutal clarity all that is within her now impossibly large (panoptic) field of vision, describing wreckage strewn across the Atlantic (596). Here is the catastrophic revolution threatened by visual exchange. Yet the sunny optimist will notice that Lucy is *not* overwhelmed by the storm, that her story does *not* end with Paul's death and the last page. *Villette* is related retrospectively, after Lucy has acquired financial independence, escaped the Pensionnat, and survived this 'Juggernaut' (592); she never specifies the length of time that has passed since the events related in her narrative occurred, but has previously implied that it may be substantial: 'I speak of a time gone by: my hair which till a late period withstood the frosts of time, lies now, at last white' (105). Writing retrospectively, with the enhanced clarity of hindsight, Lucy brings her previously disordered, limited perception under control, turning a critical eye on the surveillance system that had aggravated her perceptual disorder. Brontë ends on a painful note, but with the intimation that the independent Lucy will not be incapacitated by pain, for long after the storm has passed, her older self will look back and write the narrative that is *Villette*.

- ¹ Christopher Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800-1910*, (Chicago: The University of Chicago Press, 2008), p. 4, p. 9.
- ² See Jessica Brent, 'Haunting Pictures, Missing Letters: Visual Displacement and Narrative Elision in *Villette*', *Novel*, 37 (2003), 86-111; Paul Wotipka, 'Ocularity and Irony: Pictorialism in *Villette*', *Word & Image: A Journal of Verbal/Visual Enquiry*, 8 (1992), 100-8.
- ³ Heather Glen, *Charlotte Brontë: The Imagination in History* (Oxford: Oxford University Press, 2002), pp. 197-284.
- ⁴ Sally Shuttleworth, *Charlotte Brontë and Victorian Psychology* (Cambridge: Cambridge University Press, 1996), p. 244.
- ⁵ Charlotte Brontë, *Villette*, ed. by Mark Lilly (London: Penguin, 1979), p. 116. Further references are given as page numbers from this edition in parentheses in the text.
- ⁶ Nicholas Dames, *Amnesiac Selves: Nostalgia, Forgetting and British Fiction, 1810-1870* (Oxford: Oxford University Press, 2001); Janet Gezari, *Charlotte Brontë and Defensive Conduct: The Author and the Body at Risk* (Philadelphia: University of Pennsylvania Press, 1992), pp. 140-57; Mark M. Hennelly, 'The "Surveillance of Désirée": Freud, Foucault, and *Villette*', *Victorian Literature and Culture*, 26:2 (1998), 421-40; Diane Long Hoeveler, 'The Obscured Eye: Visual Imagery as Theme and Structure in *Villette*', *Ball State University Forum*, 19 (1978), 23-30; Mary Jacobus, 'The Buried Letter: Feminism and Romanticism in *Villette*', in *Women Writing and Writing About Women*, ed. by Mary Jacobus (London: Croom Helm, 1979), pp. 42-60; Karen Lawrence, 'The Cypher: Disclosure and Reticence in *Villette*', *Nineteenth-Century Literature*, 42 (1988), 448-466; Margaret L. Shaw, 'Narrative Surveillance and Social Control in *Villette*', *Studies in English Literature*, 34:4 (1994), 813-33.
- ⁷ Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. by Alan Sheridan (London: Allen Lane, 1975), 202-03.
- ⁸ Joseph A. Boone, 'Depolicing *Villette*: Surveillance, Invisibility, and the Female Erotics of "Heretic Narrative"', *Novel*, 26 (1992) 20-21.
- ⁹ Boone, 42.
- ¹⁰ Lauren M.E. Goodlad, *Victorian Literature and the Victorian State: Character and Governance in Liberal Society* (Baltimore: Johns Hopkins University Press, 2003), p. x.
- ¹² Gillian Beer, '"Authentic Tidings of Invisible Things": Vision and the Invisible in the Later Nineteenth Century', in *Vision in Context: Historical and Contemporary Perspectives on Sight*, ed. by Teresa Brennan and Martin Jay (New York: Routledge, 1996), pp. 83-98.
- ¹³ Elizabeth Gaskell, *The Life of Charlotte Brontë*, ed. by Elisabeth Jay (London: Penguin, 1997), p. 230; Juliet Barker, *The Brontës* (London: Weidenfeld and Nicolson, 1994), p. 506.
- ¹⁴ Charlotte Brontë (CB) to James Taylor, 15 November 1851, in *The Letters of Charlotte Brontë: With a Selection of Letters by Family and Friends*, ed. by Margaret Smith, 3 vols (Oxford: Clarendon Press, 2000), II, p. 718. CB to Ellen Nussey, 2 June [1851], p. 628; CB to Revd Patrick Brontë, 7 June [1851], pp. 630-31.
- ¹⁵ Glen, *The Imagination in History*, p. 223.
- ¹⁶ Glen, p. 224.
- ¹⁷ Glen, p. 229.
- ¹⁸ Glen, pp. 228-29.
- ¹⁹ Foucault, *Discipline and Punish*, p. 203.
- ²⁰ Sandra M. Gilbert and Susan Gubar, *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*, 2nd ed. (New Haven: Yale Nota Bene, 2000), p. 409.
- ²¹ Daniel M. Albert, *Dates in Ophthalmology* (London: Parthenon, 2002), p. 61, p. 67; C.N. Chua, 'Ophthalmology in the British Isles', <<http://www.mrcophth.com/Historyofophthalmology/ophthalmologyinuk.htm>> [accessed 17 June 2009].
- ²² Hermann von Helmholtz, *Beschreibung eines Augen-Spiegels zur Untersuchung der Netzhaut im lebenden Auge* (1851; Leipzig: Johann Ambrosius Barth, 1910).
- ²³ Hermann von Helmholtz to his father, 17 December 1850, in C. Wilbur Rucker, *A History of the Ophthalmoscope* (Rochester, Minnesota: Whiting, 1971), pp. 23-25.
- ²⁴ Alfred Schett, *The Ophthalmoscope: A Contribution to the History of its Development up to the Beginning of the 20th Century*, trans. by Donald L. Blanchard, 2 vols, Hirschberg History of Ophthalmology 1 (Ostend: J.P. Wayeborgh, 1996), pp. 14-15.
- ²⁵ C.N. Chua, 'The Ophthalmoscope', <<http://www.mrcophth.com/Historyofophthalmology/ophthalmoscope.html>>, [accessed 17 June 2009].
- ²⁶ Spencer E. Sherman, 'History of the Ophthalmoscope', *Actes du 3ème Colloque des conservateurs des musées d'histoire des sciences médicales*, ed. Christa Habrich and Juliane C. Wilmanns (Ingolstadt: Deutsches Medizinhistorisches Museum Ingolstadt, 1986), p. 85.
- ²⁷ Sherman, p. 85.

- ²⁸ Rucker, *A History of the Ophthalmoscope*, pp. 21-23.
- ²⁹ Daniel M. Albert and Paul Henkind, *Men of Vision: Lives of Notable Figures in Ophthalmology* (Philadelphia: Saunders, 1993), p. 346.
- ³⁰ Albert and Henkind, p. 352.
- ³¹ Rucker, pp. 44-45.
- ³² James Dixon, *A Guide to the Practical Study of Diseases of the Eye: With an Outline of their Medical and Operative Treatment* (London: John Churchill, 1855), pp. 8-9.
- ³³ Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT, 1990), p. 141.
- ³⁴ Rucker, pp. 35-38.
- ³⁵ George S. Dunbar, 'Proper Names in *Villette*', *Nineteenth-Century Fiction*, 15:1 (1960-61), 77-80.
- ³⁶ David Brewster, *A Treatise on Optics* (London: Longman, Rees, Orme, Brown & Green, 1831), pp. 317-19; 'Burning Instruments', *The Edinburgh Encyclopaedia; Conducted by David Brewster, With the Assistance of Gentlemen Eminent in Science and Literature*, 18 vols (1830; London: Routledge, 1999), V, pp. 132-33.
- ³⁷ Brewster, *Treatise*, p. 9.
- ³⁸ Charlotte Brontë, *Jane Eyre*, ed. by Q.D. Leavis (London: Penguin, 1985), p. 98.
- ³⁹ Isobel Armstrong, *Victorian Glassworlds: Glass Culture and the Imagination 1830-1880* (Oxford: Oxford University Press, 2008), p. 283.
- ⁴⁰ J.F. Malgaigne, *Manual of Operative Surgery Based on Normal and Pathological Anatomy*, trans. by Frederick Brittan (London: Henry Renshaw, 1846), p. 271.
- ⁴¹ Malgaigne, p. 266.
- ⁴² Glen, p. 228.
- ⁴³ Glen, pp. 33-49.
- ⁴⁴ William A. Cohen, *Embodied Literature: Victorian Literature and the Senses* (Minneapolis: University of Minnesota Press, 2009), p. 28.
- ⁴⁵ Cohen, p. 63.
- ⁴⁶ Cohen, p. 63.
- ⁴⁷ Charlotte Brontë, *The Professor*, ed. by Heather Glen (London: Penguin, 1989), p. 226.
- ⁴⁸ Joseph Boone has discussed the erotic overtones of Paul's penetrating gaze: see Boone, pp. 33-34.
- ⁴⁹ See Richard Hengist Horne, 'Eyes and Eye-Glasses: A Friendly Treatise', *Fraser's Magazine*, 9:84 (December 1876), 698-722, for a survey of literature on spectacles.
- ⁵⁰ Magne, *Des Lunettes, Conserves, Lorgnons, etc., etc. Conseils Aux Personnes Qui Ont Recours a L'Art de l'Opticien* (Paris: Baillière, Masson, Richebourg, 1851), p. 40.
- ⁵¹ According to Asa Briggs, in 1854 glasses like Paul's for short-sight were priced from 7s. 6d to £4 10s.; J.T. Hudson gives the fair price for steel-framed glasses with pebble lenses for myopia in 1840 as 16s.: Asa Briggs, *Victorian Things*, rev. ed. (Sutton: Phoenix Mill, Thrupp, 2003), pp. 84-97; J.T. Hudson, *Useful Remarks upon Spectacles, Lenses, and Opera-Glasses; With Hints to Spectacle Wearers and others; Being an Epitome of Practical and Useful Knowledge Upon this Popular and Important Subject* (London: Joseph Thomas, 1840), pp. 16-17.
- ⁵² Horne, p. 715; Hudson, p. 16-17.
- ⁵³ The manuscript has 'he gleaned', but the first edition has 'he gleamed', a fortunate error that conveys Paul's optical acquisitiveness and aggressive luminescence.
- ⁵⁴ Brontë, *Jane Eyre*, p. 476.
- ⁵⁵ [David Brewster], 'The Exposition of 1851; or, Views of the Industry, the Sciences, and the Government of England. By Charles Babbage', *North British Review*, 15 (1851), 542-543.
- ⁵⁶ Isobel Armstrong connects Lucy's experience to Harriet Martineau's writing on mesmerism: Armstrong, pp. 243-44.
- ⁵⁷ Marjolein Degenaar, *Molyneux's Problem: Three Centuries of Discussion on the Perception of Forms*, trans. by Michael J. Collins (Dordrecht: Kluwer Academic Publishers, 1996), p. 54.

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