



On the Singularity of Early Photography: William Henry Fox Talbot's Botanical Images

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In his 1844 introductory remarks to his first book of photographs, *The Pencil of Nature*, William Henry Fox Talbot emphasized that paper photographs were 'formed or depicted by optical and chemical means alone, and without the aid of any one acquainted with the art of drawing'.¹ Traditionally scholars interpreted this emphasis on the removal of the 'artist's hand' in favour of 'the pencil of nature', as marking a shift from manual to 'mechanical' and more accurate or 'objective' systems of representation.² Yet, as photography historians recently have shown, in the early years of paper photography many of the images were produced through contact printing without the aid of the camera obscura. Rather than a mechanical copy that is based on resemblance, some historians argue, the early photograph, in its inseparability from nature, was conceived to be an inscription of the natural world, an image that traces and 'authenticates' nature rather than resembles it.³ This article reconsiders the epistemological status of the early photograph through an analysis of Talbot's writings and botanical photographs. It argues that the encounter between nature and image in early photography was seen as defying the philosophical premises informing the camera obscura. Consequently, the early photograph was not conceived to be identical to the image of the camera obscura, but as inherently different from it.

This article focuses exclusively on Talbot's conceptualization of photography within the context of English science. By focusing on the first decade of paper photography, it also aims to rethink notions of historical continuity and discontinuity within the field of the history and theory of photography. In particular, the idea that with digitalization analogical photography became obsolete as suggested by the term 'post-photography'. With the shift to digital forms of production, it is argued, photography loses its privileged 'indexical' relation to its referent and thus can no longer function as a document that authenticates the 'real', a form of evidentiary 'truth'.⁴ Yet, does the shift to digital forms of production mark an 'epistemological break' in the history of photography? Are notions of historical discontinuity as evident as they appear to those who proclaim 'the death of photography' in the face of the 'virtual'? This article proposes that what the current state of 'post-photography' enables is precisely the recognition that photography's philosophical and cultural significance was not always associated with the epistemological 'quest' for 'evidence' and objective 'truth'. And consequently, it was not always its status as a 'mechanical' copy that defined the specificity of the photographic image. History presents different regimes of 'truth' and forms of intelligibility in which the photograph's epistemological role as a document can be highly specific and inconsistent.

Detail from William Henry Fox Talbot, *Wild Fennel*, 1841–42 (plate 4).

DOI:
10.1111/j.1467-8365.2011.00852.x
Art History | ISSN 0141-6790
34 | 5 | November 2011 | pages
958-977

Representation

For Talbot the paper photograph was a new kind of image, not necessarily because of its unique visual character, but because of the absolute exclusion of the artist's hand: 'it is not the artist who makes the picture, but the picture makes ITSELF.'⁵ Yet, Talbot still thought that photographic images were 'drawings' and insisted on the name 'photogenic drawing' for his first photographic process.⁶ Thus in a famous statement from his 1839 discovery account describing the first architectural images taken with the camera obscura, he states: 'And this building I believe to be the first that was ever yet known to have drawn its own picture.'⁷ In this regard photography, as Geoffrey Batchen states, 'is both a mode of drawing and a system of representation in which no drawing takes place'.⁸ Talbot removes the 'artist's hand' only to reinsert it in the form of 'nature's pencil'. And this is precisely the point where conceptual indeterminacy emerges, since it is not clear whether photographic images are simply identical copies of preexisting images such as engravings, and therefore possess no unique conceptual identity as images, or independent depictions of nature in which both drawing and painting are redefined according to a new logic of production and new forms of intelligibility.⁹

The prevailing question with regard to the new image was whether its inseparability from nature made it a 'mechanical copy' or an 'organic imitation'. Yet, this concern had nothing to do with any specific machine for the production of images. Instead it had to do with the romantic aesthetic opposition, best exemplified by S. T. Coleridge's theory of the imagination, between copying in which external appearances are privileged and a whole is created through an arbitrary addition of 'dead' parts, and imitation in which it is the invisible powers which animate nature that are addressed. Thus, the whole is always more than the sum of its parts because it synthesizes them into a new form of unity.¹⁰ Based on this distinction early reviewers often criticized photography, arguing that: 'the value of the Talbotype is its perfect precision and accuracy; but for this very reason it will be found of no great value to the mere servile copyist. It preserves all the details, but it requires a fresh exercise of the plastic powers to restore to those details the thought that gave them life and the spirit that infused them into harmonious combination.'¹¹

A mechanical copy is based on accuracy regardless of the way it was made, and for Coleridge it was actually painting which manifested the logic of copying as opposed to poetry. As Joel Snyder has shown, the use of the term 'mechanical' in the early years of photography simply indicated 'the qualities of a picture (its precise delineation of the subject in all its particularity)' and 'the skills of hand that produced it ... The machinery of photographic production is in no way central to this use of "mechanical".'¹² Snyder's argument is supported by the fact that in Talbot's first public presentations he displayed mainly photogenic drawings of objects that were made through contact printing and not camera images.¹³ In 1839 it was the contact negative image, mostly of botanical specimens, through which Talbot exhibited the potential benefits of his new copying method.¹⁴

For Talbot photography offered a new method of 'mechanical' copying not because it applied machinery but because it was quicker than manual copying and grounded in de-skilling. Steve Edwards has argued that Talbot's autogenic conception of the photograph as a picture that makes itself or pictures that are made by the sun 'is a powerful homologous displacement of human agency from the scene of production'.¹⁵ Edwards points to the way Talbot's emphasis on the self-making of the photograph relates to theories of labour such as Andrew Ure's *The Philosophy of Manufactures* (1835). Talbot's account also implicitly evokes Charles Babbage's

influential essay *On the Economy of Machinery and Manufactures* (1832), in which Babbage describes copying systems, namely lithography and engraving, as embodying the ‘essence’ of mechanical labour; that is, it is copying that serves as a model to mechanization and not vice versa.¹⁶ And while Babbage emphasizes the benefits of mechanization in terms of external corrective regulation, predictability, and accuracy because all copies of products are identical, it was precisely these qualities which photographic images lacked during this period. Practitioners of photography, amateurs and professionals alike, frequently mentioned the unpredictability of photographic processes, particularly those on paper, due to the uneven textural surfaces of unstandardized papers and the use of homemade chemicals.¹⁷ This of course resulted in unregulated forms of production which simply did not adhere to a unified and coherent standard of picture-making. Consequently, Talbot’s early emphasis on the ‘mechanical nature’ of photography was found by many practitioners to be extremely misleading.¹⁸

The failure of the early photograph to function as a ‘mechanical copy’ led historians, notably Carol Armstrong, to argue that the photograph was considered to be a unique kind of image. As Talbot famously stated in his 1839 account:

The phænomenon which I have now briefly mentioned appears to me to partake of the character of the marvellous, almost as much as any fact which physical investigation has yet brought to our knowledge. The most transitory of things, a shadow, the proverbial emblem of all that is fleeting and momentary, may be fettered by the spells of our ‘natural magic’, and may be fixed for ever in the position which it seemed only destined for a single instant to occupy.¹⁹

This statement is often interpreted in light of Roland Barthes’s claim in *Camera Lucida* that ‘the realists do not take the photograph for a “copy” of reality, but for an emanation of past reality: a magic, not an art.’²⁰ In its status as an emanation from a ‘real body’, the photograph becomes a ‘certificate of presence’, the ultimate proof that something ‘has been’. Thus from a phenomenological point of view, Barthes argues, the photograph’s ‘power of authentication exceeds the power of representation’.²¹ Referring to Barthes’s argument, Armstrong states that for nineteenth-century practitioners: ‘photography seemed to proffer something extraordinary, without precedent, whose uses could only just begin to be imagined. That something was the photograph’s unique ability to authenticate. This was a function of its fundamental indexicality, ... its status as a “literal emanation from the referent,” ... and its “tautological” relation to it.’²²

Yet, Barthes’s insistence on the photograph’s ‘extraordinary’ character has no conceptual and discursive affinity with Talbot’s statement regardless of their use of similar words. Talbot explicitly states that the phenomenon he discovered is (almost) ‘as much as any fact which physical investigation has yet brought to our knowledge’, indicating that the ‘marvellous’ or ‘magic’ nature of the phenomenon he discovered is inseparable from the scientific method he applied in his discovery as he explicitly immediately states: ‘This remarkable phænomenon, of whatever value it may turn out in its application to the arts, will at least be accepted as a new proof of the value of the inductive methods of modern science.’²³ Talbot’s conceptualization evokes not only the inductive method but also the philosophical premises informing this mode of investigation within the discourse and practice of natural philosophy. This becomes quite clear when Talbot’s statement is read in light of John Herschel’s *A Preliminary*

Discourse on the Study of Natural Philosophy (1830), which articulated the role of the natural philosopher's inquiry within English science:

The character of the true philosopher is to hope all things not impossible, and to believe all things not unreasonable ... Accustomed to trace the operation of general causes, and the exemplification of general laws, in circumstances where the uninformed and unenquiring eye perceives neither novelty nor beauty, he walks in the midst of wonders: every object which falls in his way elucidates some principle, affords some instruction, and impresses him with a sense of harmony and order.²⁴

Herschel's statement encapsulates the epistemological law of what Michel Foucault, in *The Order of Things*, terms 'representation'. Natural phenomena are 'wonders' because they repeatedly expose, against plain logic, the necessary metaphysical continuity and correspondence between nature and the human mind. Consequently, they reinforce simultaneously theological convictions of the divine design argument and the 'independent' validity of scientific modes of inquiry. Talbot's statement thus indicates the discursive status of the photograph as both a natural phenomenon produced by light and an inductively discovered scientific object produced by an artificial chemical process – a *fixed shadow*.

The undecided epistemological status of phenomena within natural philosophy as direct objects of observation and as scientific abstractions or instrumental productions is in fact precisely what marks, according to Simon Schaffer, the discursive specificity of natural philosophy as a form of scientific practice. He emphasizes that the discourse of natural philosophy was 'structured by the dialectic of the anomalous in contrast with the common-sensical'.²⁵ Talbot's formulation simply reinforces the conformity of the photograph to specific modes of physical investigation and to the philosophical conditions informing them, rather than pointing to its 'extraordinary' character. It is therefore not a subjective phenomenological response to the uniqueness of the photograph as a 'real' trace of the past which constitutes it as 'magic', but the historical and discursive conditions of its formation. The issue is not photography's 'mad' status as a 'direct emanation from the referent', but its reducibility to specific scientific and philosophical forms of intelligibility in which the observation of nature is subjected to theological convictions than cannot be grounded epistemologically or materially. In this regard the photograph is not a proof that an object 'has been there'. Instead it demonstrates the fact that in the 1830s, following the challenges British empiricism faced from David Hume's scepticist attack on the law of causality and the introduction of Immanuel Kant's transcendental philosophy to England by Romantic poets such as Coleridge, the validity of induction can only be based on 'Common Sense' principles, which are, as Thomas Reid argued, impossible to disbelieve and impossible to prove.²⁶ After all, in his account Talbot claims that the photograph provides a 'new proof' for the value of the inductive method, indicating the necessity of providing a proof in the first place.²⁷

Paradoxically, by the time nature inherently became an image, it was no longer *conceived* to be an image. While under the Classical episteme and the logic of representation, as can be seen in Talbot's statements, the character and status of phenomena were conceived as inseparable from the methods through which it was possible to study nature, such that the observable empirical fact was always a part of a scientific classification 'table' and simultaneously a visible 'image' of a divine

design. With emergence of the Modern episteme, Foucault argues, nature becomes separated from thought and unfolds in its own space. Historians and philosophers of science also point out that the 1830s mark the emergence of modern physics and the end of natural philosophy as a viable framework for the study of nature.²⁸ In new physical theories, like the wave theory of light, the conceptual focus was on continuous processes of motion rather than on substances and matter, and this led to the introduction of temporality into explanatory models of natural systems.²⁹ Within new knowledge formations time, and not the spatial table of representation, came to define the status and mode of being of things. History, Foucault states, 'is not to be understood as the compilation of factual successions or sequences as they may have occurred; it is the fundamental mode of being of empiricities, upon the basis of which they are affirmed, posited, arranged, and distributed in the space of knowledge for the use of such disciplines or sciences as may arise'.³⁰ To conceive of living beings as 'historical' or as formed in time means to move beyond the visible observable table into the 'dark' side of internal, invisible, and dynamic forces that animate nature and operate independently from any theological or metaphysical convictions. As Foucault points out, 'When the Same and the Other both belong to a single space there is *natural history*; something like *biology* becomes possible when this unity of level begins to break up, and when differences stand out against the background of an identity that is deeper and, as it were, more serious than that unity.'³¹ The deeper and invisible 'identity' Foucault refers to is the biological concept of 'life' which marked the fact that the study of nature is no longer based on atoms and predictable mechanisms, but on vital processes that cannot be fully accounted for.

More than anything it is Coleridge's romantic theory of the imagination that demonstrates the radical shift in the epistemological conditions of knowledge in England in the early nineteenth century.³² Coleridge's romantic rebellion against the 'despotism of the eye' in his *Biographia Literaria* indicates that by the 1820s the study of nature can no longer be reduced to its visible and mechanical aspects.³³ The imagination marks the eclipse of representation because it is a *synthetic* faculty whose primary function, for both Kant and Coleridge, is to link the transcendental principles of reason to empirical sense perception, but whose very existence marks the impossibility of an epistemological synthesis of knowledge outside the space of representation.³⁴ That is, the imagination becomes necessary precisely because nature and man no longer occupy the same space and thus the validity of knowledge can no longer be grounded metaphysically through the circular law of representation and induction. Knowledge is now located within 'Man' as an 'empirico-transcendental doublet' whose sensorial density challenges any claim for the universality of knowledge. Thus for Coleridge the faculty of the imagination simultaneously marks the creative potential of 'Man', yet, at the same time, it points to his inherent limits, what Foucault terms 'finitude'. Hence the emphasis in romantic aesthetic theory on unity between man and nature as a goal to be attained not a condition that can be safely assumed.

Significantly, the role of the imagination, and of the active mind, was at the centre of a debate surrounding induction as a method of discovery. While Herschel in the *Discourse* describes the role of the mind in discovery as primarily passive and 'ideas' (or laws) as simply 'accumulated sensations', the outcome a gradual and continuous process of generalization whose validity is based on the metaphysical design argument. In opposition to this view, William Whewell in his *History* (1837) and *Philosophy of the Inductive Sciences* (1840) emphasized the active role of the mind in discovery and insisted that there exists a clear qualitative distinction between ideas

and sensations. Whewell shows that there are 'fundamental ideas' which transcend the conditions of experience. Experience can discover general truths, but it cannot give those truths universality; on the other hand, universal truths, though they borrow their form from ideas, cannot be understood except by the actual study of nature. He therefore defines discovery as a creative process in which scientific conceptions emerge in a discontinuous and unexpected manner in the mind of a genius. Ideas in discovery present 'inexplicable strokes of inventive talent', revealing an irreducible subjective imaginative process that cannot be fully accounted for.³⁵

Talbot's 1844 introduction to *The Pencil of Nature*, 'A Brief Historical Sketch of the Invention of the Art', is informed by Whewell's model of discovery and signals a significant shift from his 1839 discovery account. By this time, five years after his first public announcement, Talbot no longer emphasizes the inductive logical process through which he conducted his experiments, but focuses instead on the 'original idea', fixing the images of the camera obscura, which led to his actual experiments in the first place. And following Whewell's description of the discovery process, Talbot dramatizes the specific moment of discovery during a vacation on the shores of Lake Como in 1833 as an unexpected moment of illumination that cannot be explained through any kind of method.³⁶ Talbot thus presents himself as the discoverer of 'the principles and practice of Photogenic Drawing', and therefore his account of his discovery now becomes the history of the Art. In this regard his two different discovery accounts are symptomatic of the shift in models of discovery that Schaffer describes as marking the end of natural philosophy and the emergence of modern professionalized science.³⁷

Historians of photography already pointed to the relation between Coleridge's aesthetic theories and early writings on photography.³⁸ Yet, what is significant for an understanding of the relations between the early photograph and nature is the way Coleridge's theory of the imagination is informed by his essay *Theory of Life*.³⁹ Coleridge defines life as 'the principle of individuation' and a 'power which discloses itself from within as a principle of unity in the many' or 'unity in multitude'.⁴⁰ Life is a force that discloses itself in a range of different phenomena as that which both divides (such as polarity in magnetism) and connects (such as electricity). Similarly, he defines the imagination in the *Biographia* as an echo of the divine act of creation that 'dissolves, diffuses, dissipates, in order to recreate; or where this process is rendered impossible, yet still at all events it struggles to idealise and to unify. It is essentially vital, even as all objects (as objects) are essentially fixed or dead'.⁴¹ Both the imagination and life are conceptualized as forces, ceaseless acts of differentiation which exhibit the same unresolved tension between unity and multiplicity.⁴²

The correspondence between the faculty of the imagination and the idea of life indicates that Coleridge's aesthetics was grounded in the new epistemological concerns that came to redefine what an image was in terms of its double relation to both nature and thought. Thus his well-known aesthetic distinctions between 'mechanical copying' and 'organic imitation' or between symbol and allegory were not just aesthetic 'rules' for artists and photographers to apply, but concepts that were devised by Coleridge in order to challenge the epistemological and mechanical premises of British empiricism by outlining a radical form of vitalist ontology.⁴³ It is within this new 'organic' economy of the empirical and the idea of life as a vital temporal force, this essay argues, that the specificity of the early photograph and its relation to nature need to be accounted for. The specific historical conditions outlined so far also indicate that it is not possible to simply align the history of photography with the history of the camera obscura as part of a teleological universal quest after

verisimilitude. As Jonathan Crary argues, 'the camera obscura and the photographic camera, as assemblages, practices, and social objects, belong to two fundamentally different organizations of representation and the observer, as well as the observer's relation to the visible.'⁴⁴

Difference: A Singular Image

Early practitioners of photography came quickly to see that the early photograph was not an 'Image of Thought', a term Gilles Deleuze uses to describe the philosophical logic of representation in *Difference and Repetition*.⁴⁵ The photographic image, as a new kind of image, was found to be very different from the image of the camera obscura regardless of its early association with it. In a striking text by Antoine Claudet, the author notes the diminished 'artistic effect' of photographic portraits when compared to the images of the camera obscura. He offers an explanation in which he explicitly addresses the camera obscura as a model of vision:

There is a great difference between the instantaneous effect by which the sight perceives objects, and that of a certain period during which the Photographic Image is produced. Whatever may be the manner in which an object is illuminated by the light of the day, the eye perceives instantly all the points of the object, and there exists sufficient reflected light to illuminate the parts in shadow. If we suppose that the parts strongly lighted have an intensity a hundred times greater than the parts in the shadow, *this proportion will always remain the same for the eye; there is no accumulation of effect; when the eye is fixed upon the same object, there exists for each instant a complete and instantaneous perception.* If we look at an object during one or a hundred seconds there always appears to us the same relation between the strong lights, the half-tints, and the shadows. But this is not so with the effect produced upon the Photographic Plate; *the light operates gradually; at first the strong lights only are visible. If we stop at this point, the half-tints and shadows will be invisible; by continuing, the half-tints develop themselves, and during this time the lights have become more intense; lastly, the shadows appear; during the whole time the lights have been operating . . . There is nothing like this in the production of the visual image of the camera obscura; it remains always the same, and for this reason appears more perfect.*⁴⁶

The perfection and identity of the camera image is grounded in its adherence to a model of vision in which the operation of the eye and perception in general are described in isolation from the operations of any specific body or sensorial organization.⁴⁷ Perception is described as a relation of spatial synchronicity in which the identity of the object is epistemologically grounded in the consistency of perception, while the continuous receptivity of the eye is predicated on the fixed identity of the object. Time as an inherent or qualitative factor of perception is excluded from this model 'as there is no accumulation of effect', and its exclusion is a condition for the identity of the camera image as 'always the same' and therefore perfect. Sameness thus hinges on the exclusion of time as a differentiating element.

The exclusion of time and the emphasis on perceptual correspondence points to a model of thought in which the sensible is a form or quality that is presupposed by the faculties. In this model of thought, thinking consists in the conformity of being to transcendental forms and concepts which determine in advance what form the empirical can have. This is why Claudet can safely assume that as long as perceptual continuity is maintained, both resemblance and sameness can be predicted and thus

1 William Henry Fox Talbot,
A Cascade of Spruce Needles,
1839. Photogenic drawing,
22.7 × 18.5 cm. London: The
British Library (Talbot 10/12).
Photo: © The British Library
Board.



the camera image will always be identical. The camera image is an ‘image of thought’, because the camera obscura in its mechanical form exemplifies the philosophical logic of representation in which the sensorial faculties of the subject and the attributes of the object are given in advance and therefore can be represented in the form of the ‘same’.

In contrast, the photographic image can be seen as a site of an unregulated temporal ‘encounter’ between light and a sensitive surface whose outcome cannot be fully predicted. The photographic image, in its inseparability from ‘nature’, introduces unpredictability and *difference* as a function of the photograph’s dependency on solar light. In its temporal formation the photographic image turns nature into a ground out of which any form of differentiation (strong lights, half-tints, and shadows) emerges. The photograph transcribes or embodies the movement of difference in a way that cannot be fixed in advance. As Talbot argued, ‘it is not the artist who makes the picture but the picture makes itself.’ The photographic plate thus embodies a model of thought in which the sensible is an effect that can only be sensed in its temporal accumulation but not known; that is, cannot be presupposed

and represented in an identical form as there is no way to predict its mode of formation. Consequently, the image is not an emblem of identity and sameness, but a mark of what Deleuze terms singularity.

The idea of a picture that ‘makes itself’ or ‘develops itself’ as Talbot later argued in relation to his second photographic process, the calotype, emphasizes the empirical way the photograph is formed. This process is echoed not only in the botanical imagery Talbot selected, but also in the modes of arrangement and delimitation that underline the compositional aspects of his images. Consider Talbot’s most striking cameraless image of 1839, *A Cascade of Spruce Needles* (plate 1) in which it is not the plant’s particular arrangement on the paper that creates the image, but the different intensities of its needles’ distribution on the paper’s surface that present the plant as an extensive diagram of entangled lines and flat shifting planes. The needles spread out on the paper in a way that suggests no start or end point, bottom or top for the image, but a detachable, reversible, and constantly modifiable map. Thus it is not the needles that are delimited by the paper, but the paper itself which is articulated and punctuated by their exceeding movement and ceaseless dispersion. The image displays neither a centralized structure nor a clear outline division into parts that can be identified or traced against a fixed ‘table’ of classification, yet something is formed: an abstract dynamic map composed of material effects that are at the same time formal signs.

Consider also *Leaves of the Pæony* (plate 2) in which the depicted object is squeezed into the paper edges and the paper itself is trimmed irregularly in a way which further emphasizes the pointed but also rounded shape of the leaves. The most striking features of the image are the leaves’ outline forms that are clearly emphasized against the dark background, and the leaves’ legible inner veins and patterns. Yet, the plant’s leaves are also seen as inseparable from one another both by ‘nature’ and due to their specific condensed arrangement on the paper. This produces a sense of expended linear continuum in the image and dismantles the clear spatial separation between the external outline forms and the inner patterns. In its specific arrangement on the paper’s surface and in its own ‘life’ specificity, the plant suggests the infiltration of accumulating processes of differentiation. These processes spread from the inner veins’ patterns, building themselves one on top of the other, into the outline forms of the leaves that are now seen as extensions of lines expanding irregularly and continuously. Finally, even the trimmed and jagged edges of the paper now appear as part of these processes of differentiation. And again, it is not the division into parts that marks the specificity of the depicted plant, but the adding up of dimensions, the inherent variations of lines within an expansive plane. It is thus through arrangement, delimitation and the plant’s irreducible specificity that difference is seen as working simultaneously from both within and without, ‘growing’ and evolving infinitely.

This reading of the images suggests that the early photograph, both in its mode of formation and imagery, no longer represents the static ‘order of things’, but registers an evolving visual map in which vital forces mark themselves as they unfold in time. These images suggest that Talbot’s continuous emphasis on the self-agency of nature points not to the ‘mechanical’ or ‘automatic’ aspects of the image, but precisely to its empirical and ‘aesthetic’ ones. Aesthetic because within the context of romanticism, the idea of life as an act of differentiation encapsulates the very idea of creation as argued earlier with regard to Coleridge’s theory of the imagination where the principles of divine and human poetic creation are closely aligned. Thus in the early photograph, like in Coleridge’s definition of the symbol, the sensible is conceived to

be inseparable from the intelligible as nature is both the source of difference and its object; while in the camera obscura or in allegory objects of sense are represented by predetermined abstract terms that bear no essential 'organic' relation to them, only an arbitrary one. The crucial point is that, as Thomas McFarland argues, the symbol is in its origin a physical thing rather than a rhetorical trope whose meaning is restricted to the realm of language.⁴⁸ The symbol is an empirical entity that stands for a new 'organic' economy of visibility and intelligibility in the Modern episteme of knowledge.⁴⁹ It is thus defined by the 'translucence of the Special in the Individual, or of the General in the Especial ... Above all by the translucence of the Eternal through



2 William Henry Fox Talbot, *Foglia di Peonia* [Peony Leaf], 1839. Antonio Bertoloni Album, leaf 14 recto. Photogenic drawing, 18.6 × 12.0 cm, irregularly trimmed. New York: The Metropolitan Museum of Art (Harris Brisbane Dick Fund, 1936 (36.37 (9))). Photo: © The Metropolitan Museum of Art/ Art Resource, NY.

and in the Temporal'.⁵⁰ And again, like the imagination, as much as the symbol suggests a synthesis, it also manifests an unbridgeable gap between the empirical and the transcendental which remains sustained but temporarily suspended. Yet, while Coleridge emphasizes that both the imagination and the symbol can 'idealize' nature by suspending difference and the movement of time, it is precisely the unlimited capacity of nature to manifest change and its resistance to fixed identity that is marked as unique to the photograph.

For Talbot the unique temporality of the photographic image becomes particularly striking when, as part of his discovery of the calotype, he introduces the idea of 'latency' into paper photography: the idea that the image develops after an initial short exposure to light in the camera. As it is precisely the inherent productivity of the calotype negative that is emphasized by Talbot:

After a Calotype picture has furnished several copies, it sometimes grows faint, and no more good copies then can be made from it. But these pictures possess the beautiful and extraordinary property of being susceptible of revival ... In reviving the picture it sometimes happens that various details make their appearance *which had not before been seen, having been latent all the time*, yet nevertheless not destroyed by their long exposure to sunshine.⁵¹

In order to make more copies from it, the calotype negative image is revived by the chemical reapplication of the developer gallic acid and this process reintroduces potentiality: the capacity to produce more images that are not identical. The latent image is actualized through further differentiation (more details are exposed), and Talbot actually ends his text by stating that the difference between a photogenic drawing negative and the calotype negative is that the latter 'receives a virtual instead of an actual impression from the light, which it requires a subsequent process to develop'.⁵² Obviously, this use of the term 'virtual' bares no similarity to contemporary uses of the term as it seems that Talbot might be just referring to the fact that the change in the exposed paper was invisible until further chemical development. Yet the idea that the image 'develops' highlights the temporal process of its production and the unpredictable reintroduction of difference.

What is emphasized in Talbot's writings after the discovery of the calotype is precisely the lack of mechanical identity with regard to the production of photographs. His latter statements present a reconsideration of his earlier ones:

I remember it was said by many persons, at the time when photogenic drawing was first spoken of, that it was likely to prove injurious to art, as substituting mere *mechanical labour* in lieu of talent and experience. Now, so far from this being the case, I find that in this, as in most other things, there is ample room for the exercise of skill and judgment. It would hardly be believed how different an effect is produced by a longer or shorter exposure to the light, and, also, by mere variation in the fixing process, by means of which almost any tint, cold or warm, may be thrown over the picture, and the effect of bright or gloomy weather may be imitated at pleasure. All this falls within the artist's province to combine and to regulate.⁵³

Talbot now acknowledges that rather than copying or tracing, nature as a force differentiates by producing multiple and irreducible effects. The identity of the

image is determined by the artist according to the norms of conventional imitation and therefore implies the execution of artistic skill. The agency and skill of the artist is reintroduced into the process, I further argue, because nature *repeats* more than it 'traces' or 'resembles'.⁵⁴

Repetition: Botanical Diagrams

It was mainly during the production of *The Pencil of Nature* that Talbot noticed that copies made from a single negative were not identical and differed in their colours and tonality due to changing light conditions and chemical composition. Yet rather than 'correcting' this lack of uniformity he ends up praising it: 'as the process presents us spontaneously with a variety of shades of colour, it was thought best to admit whichever appeared pleasing to the eye, without aiming at a uniformity which is hardly attainable.'⁵⁵ Talbot's photographs are singular copies since, as the reviewer of *The Art-Union* stated, 'no two are exactly alike'.⁵⁶ Thus as singular copies they exemplify the epistemological logic of the simulacrum as a *failed copy* which displays a model only in a form which dismantles its possibility.

The simulacrum is an emblem of repetition, yet while in representation repetition is understood as 'perfect resemblance', for Deleuze it signals a power which is concerned with singularities, with the *universality of the singular*, as opposed to the generality of the particular. He defines repetition as a 'difference without concept', difference which is unmarked by the transcendental concept or Idea but is nevertheless constituting itself in the existent in the form of twins, reflections, echoes, and doubles.⁵⁷ Talbot's copies are singular since each of them repeats by interiorizing an inherently irreducible difference in nature itself which destroys the possibility of a model as a static form of identity. This concept of repetition accounts for the failure of the early photograph to function as botanical illustration, and further elucidates the way the encounter between nature and image manifests itself materially, formally and visually in Talbot's botanical photographs.

In her comprehensive account of botanical forms of illustration in the nineteenth century, Carol Armstrong argues that the early photograph failed to serve as a botanical form of illustration because of its inherent (ontological) failure to 'signify'.⁵⁸ Armstrong constructs a hierarchical spectrum of different kinds of illustrations: from the 'certificate' (the real dried specimen) to the 'code' (handmade botanical drawing) and situates photography in the middle as a form of nature print or drawing.⁵⁹ Photography, she states, 'is the natural progeny of nature drawing as much as it is its alter-ego and other, its trace as much as its eclipse. This is a medium-specificity in which photography, like nature drawing, is constituted as an inscription of the natural world on a surface (paper) derived from the natural world, whose nature-made marks are inseparable from and intertwined with the nature-made ground of which they have become an integral part.'⁶⁰ Armstrong argues that the early cameraless photograph manifested the 'essence' of photography as an indexical sign because it could authenticate nature, but could not encode or classify it as photographs failed to indicate colour, volume, cross-section and internal structure, all necessary for identification and classification.

In contrast, this article argues, that as a simulacrum, a 'copy without an original', the early photograph resisted not only resemblance, but also notions of identity and presence as these underline Barthes's concept of the index. I contend that the failure of the photograph to serve as a botanical form of illustration had to do with the introduction of time into the conditions of knowledge in the early nineteenth century. Following Coleridge's aesthetic theory, this failure resulted from the



3 William Henry Fox Talbot, *Branch of Leaves of Mercurialis perennis*, 1839. Photogenic drawing, 11.6 × 17.2 cm. Washington, DC: Photographic History Collection, Natural Museum of American History, Smithsonian Institution (AFS 206). Photo: © Photographic History Collection/ National Museum of American History.

impossible encounter between botany as a science of classification and chemistry as the science of forces.⁶¹ How can the dynamic and conflicting forces of nature realize themselves in the fixed and dead categories of botany and representation which reduce nature to its visible aspects? How can life manifest itself in a form which resists its capacity for change and inherent differentiation? This problem manifests itself in Talbot's cameraless images in which the temporal 'encounter' of the photograph with nature is much more *productive* than simply reproductive or tautological. As was shown in the analysis of *A Cascade of Spruce Needles*, the image is not tracing the plant but turns it into a dynamic map, a site of an unpredictable encounter that results in nonrepresentational visual forms.

Talbot's botanical images function as temporal diagrams that unfold through variation and expansion. What defines them is not the structural logic of a particular sign, but a substantive heterogeneity in which signs are produced inseparably from the actual process of differentiation (both natural and chemical) that produces the image. Consider Talbot's *Branch of Leaves of Mercurialis perennis* (plate 3). In this image the branch is centralized, its stem is cut by the paper, and its leaves' outline forms are clearly presented, but the leaves also overlap in a manner that creates an internal pattern like a distinct visual rhythm. Another visual pattern is suggested by the irregular shift from dark to light areas and the inconsistent degrees of translucency due to the varied thickness of the leaves and the uneven sensitivity of the paper. The result is that each leaf appears different from the other leaves, while its own specific texture is presented discontinuously with areas that are either erased, blocked, or blurred. This inner process of *folding* in the image hovers between materiality (chemical sensitivity, conditions of luminosity) and signification (patterning and

coding). It produces effects that are at the same time signs that are inseparable from the depicted object. In this regard the image does not trace or 'resemble' the plant but connects different semiotic chains (material, formal, biological, chemical) within the image's different states of formation. Signification 'develops' inseparably from the material processes of the image's formation in its encounter with the plant. This is in direct opposition to the index, in which signification is always presented as necessarily divorced from authentication, that is, from the image's process of production.

Finally, consider Talbot's *Wild Fennel* (plate 4). This image can be read as an emblem of singularity and not of particularity; that its entangled linearity and excessive intricacy presents not the reproduced structure of a plant, but an abstract diagram of change and growth. The early photographic image could not be an 'identical' or a 'mechanical' copy due to the specific conditions of its production; at the same time, it could not have functioned as a 'natural copy', since within the specific historical conditions of its formation it was no longer possible to conceive of nature as a static 'image' that tautologically reinforced the necessary epistemological correspondence between nature and human nature. As a 'failed copy', a simulacrum, it manifested the limitations of representation and the epistemological incompatibility of its pictorial and visual forms in the face of the disseminating force of time through which things

4 William Henry Fox Talbot, *Wild Fennel* [previous title *A Branch of Elderberry*], 1841–42. Salted paper print, 18.7 × 22.7 cm, corners clipped. New York: The Metropolitan Museum of Art (Gilman Collection, Purchase, Denise and Andrew Saul Gift, 2005 (2005.100.260)). Photo: © The Metropolitan Museum of Art/Art Resource, NY.



come into being. In its own inherent abstractness as a productive map of immanent difference it came to embody, materially and conceptually, not the visible 'table of things', but the invisible potential forces of 'life'.

For some scholars, notably Rosalind Krauss, the simulacrum is the very condition of the photographic image and not of its historical specificity, as argued here. Krauss argues that the condition of photography as the 'false copy' deconstructed 'the whole system of model and copy'. Photography introduces the same and the indifferent into the modern aesthetic discourse of art, which reifies difference since it is grounded in notions of authenticity, originality and uniqueness. She thus concludes: 'There is a discourse proper to photography; only, we would have to add, it is not an aesthetic discourse. It is a project of deconstruction in which art is distanced and separated from itself.'⁶² Yet, as this article shows, in the early years of its formation, it was rather the incompatibility of the photographic image with resemblance and identity which marked its condition. Its status as a simulacrum resulted not in the abolition of difference through mechanical resemblance, but precisely in the reintroduction of difference through repetition. The photographic image repeats and dismantles the possibility of model and copy as Krauss states, yet this possibility has nothing to do with representation but with time. While for postmodern thinkers, like Jean Baudrillard, the simulacrum is a sign that indicates that there is no reality, but only 'reality effect, the product of simulations and signs',⁶³ for Deleuze, it is what marks the inherent ontological temporal capacity of being to introduce difference and change. For Deleuze, the operations of the simulacrum are not reducible to logical or linguistic models and are therefore not spatial or semiotic, but substantive in the sense that they precede any form of 'representation'. This is why Deleuze's criticism does not end up, like Krauss's criticism, excluding the possibility of an aesthetic discourse as part of a postmodern critique of the 'real', but instead offers the suggestion that aesthetics will become the model science of the sensible, yet one in which the sensible is not that which presupposes the exercise of the faculties, but that which can only be sensed, 'the very being of the sensible'.⁶⁴

Thus while the simulacrum is not an essential form of photographic intelligibility but a historically specific one, its operations do not in any way exclude the possibility of an aesthetic discourse for photography and art. They obviously exclude the possibility of a modernist discourse that is grounded on notions of originality and authenticity as Krauss demonstrates, yet this should not suggest that aesthetics *in toto* should be rejected. As 'the science of the sensible' aesthetics is not simply a 'disinterested' discourse of art, but as Deleuze suggests, a virtual set of possibilities within that which exists, a modality of difference that is grounded in the sensible itself, in its history and genesis before its consolidation into 'representation' as a concept or idea, a defined subject and object.

Yet in emphasizing the early status of the photograph as a 'failed copy', a simulacrum, this article is not attributing a new form of ontological intelligibility to photography. Quite the opposite: the argument is Foucauldian in the sense that it aims to point to historical difference and epistemological discontinuity between different forms of photographic intelligibility: the mechanical copy, the natural copy, and the failed copy. At the same time, this analysis is also meant to introduce continuity into the history of photography by suggesting that virtuality is not the new condition which defines photography but precisely what points to its long-term and highly complicated relation to the epistemological regimes in which it was formed. It also suggests that materiality, in the context of photography, is not in itself a guarantee of 'truth' that marks a privileged 'authenticating' relation to the 'real'.

Thus the elimination of photo-chemical materiality in favour of the digital does not necessarily signal an 'epistemological break'. The historicity of the photograph pertains not only to its material modes of production, but also to its forms of intelligibility that are much more varied and complex than the by-now exhausted reductive opposition between representation and authentication.

The concept of the simulacrum also problematizes the historical division between modern and postmodern discourses of art. This division has recently been challenged by Jacques Rancière, who has shown that the historical and theoretical assumption of a radical break cannot be historically and conceptually sustained because terms such as political or non-political, aesthetic and anti-aesthetic, can be assigned with equal justification to either side of the break. Rancière argues that the arts of the modern era belong to what he calls an 'aesthetic regime', which manifests not an exclusive opposition between aesthetic autonomy and the demand 'for the integration of art into life', but an effective negotiation between autonomy and heteronomy.⁶⁵ This article employs the same critical strategy by showing that the concept of the simulacrum can be credited to the early history of photography and not only to its 'postmodern condition' as a 'theoretical object' or to its current 'virtual' condition.

Moreover, the simulacrum illustrates the fact that criticality is not opposed to aesthetics. It thus opens the possibility to extract a different genealogy of aesthetics that is not the 'Other' of politics. From Coleridge to Deleuze to Rancière, aesthetics is not simply a 'theory of art' or a 'science of beauty' but a discourse that takes part in the constitution of forms of knowledge and models of subjectivity. For Coleridge aesthetics signals the unresolved relations between the empirical and the transcendental, for Deleuze it marks the inherent virtuality of being, and for Rancière aesthetics is a factor of a specific organization of social roles and communality. Thus while the critical viability of photography does not necessarily hinge on its materiality and indexicality, its political currency is not predicated on the elimination of an aesthetic discourse for photography. Photography's current epistemological role will need to be defined not only in relation to its technological mode of production or its 'anti-aesthetic' operations, but primarily in relation to broad, and as it now seems highly contested, 'aesthetic' political regimes of sense and meaning.

Notes

I sincerely thank Seth McCormick and Steve Edwards for their critical comments and editorial suggestions on an earlier version of the essay. I am grateful to the Getty Foundation for awarding me a post-doctoral fellowship that enabled me to write this article.

- 1 William Henry Fox Talbot, *The Pencil of Nature* [1844], New York, 1969, n.p.
- 2 See for example Martin Kemp's assertion that photography is 'a logical (if not inevitable) outcome' of the long-term 'ambition to invent a machine or device for the "perfect" imitation of nature'. Martin Kemp, *The Science of Art*, New Haven, 1992, 167. See also Beaumont Newhall's statement that 'The physical aid of camera obscura and camera lucida had drawn men so near to an exact copying of nature and to the satisfaction of the current craving for reality that they could not abide the intrusion of the pencil of man to close the gap. Only the pencil of nature would do'. *History of Photography*, 5th edn, New York, 1982, 11.
- 3 See Carol Armstrong, *Scenes in a Library: Reading the Photograph in the Book, 1843–1875*, Cambridge, MA, 1988. See also her essay 'Cameraless:

From natural illustrations and nature prints to manual and photogenic drawings and other botanographs', in Carol Armstrong and Catherine de Zegher, eds, *Ocean Flowers: Impressions from Nature*, Princeton, NJ and Oxford, 2004, 54–165.

- 4 The canonical text on the condition of post-photography is William J. Mitchell, *The Reconfigured Eye: Visual Truth in the Post-Photographic Era*, Cambridge, MA, 1992. For a critical response to Mitchell's conceptualization of digital photography see Lev Manovich, 'The paradoxes of digital photography', in Hubertus v. Amelunxen et al., eds, *Photography after Photography: Memory and Representation in the Digital Age*, Amsterdam and Munich, 1996, 57–65. See also the collection in Mark Haworth-Booth, ed., *Metamorphoses: Photography in the Electronic Age*, New York, 1994; Anne-Marie Willis, 'Digitisation and the living death of photography', in Philip Howard, ed., *Culture, Technology and Creativity in the Late Twentieth century*, London, 1990, 197–208; Kevin Robins, 'The virtual unconscious in post-photography', *Science as Culture*, 3: 14, 1992, 99–115; and Geoffrey Batchen, 'On post-photography', *Afterimage*, 20: 3, October 1992, 17.
- 5 *The Literary Gazette*, 1150, 2 February 1839, 73 (emphasis in original).
- 6 Talbot's first photographic process, photogenic drawing, was a 'print-out' process that fully depended on solar energy for the production

- of negative images. Alternately, his second photographic process, the calotype, was a 'developed-out' process in which after a short exposure time an invisible image is formed and later developed by chemical means (gallic acid, the chemical agent Talbot claimed he discovered in 1841). These terms are used by Larry Schaaf in his *The Photographic Art of William Henry Fox Talbot*, Princeton, NJ, 2000, 17.
- 7 William Henry Fox Talbot, 'Some account of the art of photogenic drawing, or, the process by which natural objects may be made to delineate themselves without the aid of the artist's pencil', in Vicki Goldberg, ed., *Photography in Print*, Albuquerque, NM, 1981, 46 (emphasis in original).
 - 8 Geoffrey Batchen, *Burning with Desire: The Conception of Photography*, Cambridge, MA, 1997, 68.
 - 9 In his 'Enabling confusion', Joel Snyder formulates the problem in terms of physical agency: 'This equivocation about the physical agency or the efficient cause of the photograph – is it the building or the camera obscura image that causes the picture? – is vexing'. *History of Photography*, 26: 2, Summer 2002, 157.
 - 10 In his *Biographia Literaria* Coleridge stated, 'Could a rule be given from without, poetry would cease to be poetry, and sink into a mechanical art. It would be a fashioning, not a creation. The rules of the IMAGINATION are themselves the very powers of growth and production. The words, to which they are reducible, present only the outlines and external appearance of a fruit.' S. T. Coleridge, *Biographia Literaria* II [1817], *The Collected Works of Samuel Taylor Coleridge*, vol. 7, eds James Engell and W. Jackson Bate, London and Princeton, NJ, 1983, 83–4 (emphasis in original).
 - 11 *The Art-Union*, 8: 92, 1 July 1846, 195.
 - 12 Joel Snyder, 'Res ipsa loquitur', in Lorraine Daston, ed., *Things that Talk: Object Lessons from Art and Science*, New York, 2004, 202.
 - 13 For his first major exhibition in August 1839 at the British Association for the Advancement of Science (BAAS) annual meeting in Birmingham, Talbot prepared an inventory of about ninety images from which only twenty were positive camera images of architectural views and interiors. The inventory is reproduced in *Henry Fox Talbot: Selected Texts and Bibliography*, ed. Mike Weaver, Oxford, 1992, 58.
 - 14 In his 1839 inventory Talbot didn't use the terms 'negative' and 'positive', but respectively 'images obtained by the direct action of light, and of the same size with the objects' and 'reversed images, requiring the action of light to be twice employed'. At a later point Talbot adopted the terms 'negative' and 'positive' which were suggested by John Herschel in his paper 'On the chemical action of the rays of the solar spectrum on preparations of silver and other substances, both metallic and non-metallic, and on some photographic processes', in *Philosophical Transactions of the Royal Society of London*, 130, 1840, 3. Yet, as late as 1844, Talbot still found the negative image of lace or leaves as intelligible as a positive image of these objects. As he states in his comments to plate XX 'Lace' in *The Pencil of Nature*: '[I]n copying such things as lace or leaves of plants, a negative image is perfectly allowable, black lace being as familiar to the eye as white lace, and the object being only to exhibit the pattern with accuracy.' Talbot, *The Pencil of Nature*, n.p.
 - 15 Steve Edwards, *The Making of English Photography*, University Park, PA, 2006, 44. See also his essay 'The dialectics of skill in Talbot's dream world', *History of Photography*, 26: 2, Summer 2002, 113–18.
 - 16 Babbage argues: 'Nothing is more remarkable, and yet less unexpected, than the perfect identity of things manufactured by the same tool ... The same identity pervades all the arts of printing; the impressions from the same block, or the same copperplate, have a similarity which no labour could produce by hand. The minutest traces are transferred to all the impressions, and no omission can arise from the inattention of the operator ... The accuracy with which the machinery executes its work is, perhaps, one of its most important advantages: it may, however, be contended, that a considerable portion of this advantage may be resolved into saving of time.' Charles Babbage, *The Works of Charles Babbage*, vol. 8, ed. Martin Campbell-Kelly, London, 1989, 47–8.
 - 17 Larry Schaaf states that 'Photographic chemicals were often made up in the kitchen by the photographer himself. Those purchased from a chemist adhered to no standard. Even discounting cheating and dishonest practices, few chemists employed the same approaches as others, and often were not consistent themselves from week to week. Similar capriciousness was found in the manufacture of papers, which presented even greater problems.' *Out of the Shadows: Herschel, Talbot and the Invention of Photography*, London and New Haven, 1992, 59.
 - 18 By 1847, the idea of photography as a 'mechanical' procedure was ridiculed, for example, by Antoine Claudet, a professional photographer: 'In Photography the difficulties are very great, although it is generally imagined that it is merely a mechanical operation, which depends solely upon the possession of a patented apparatus, with which we expect to become painters of miniatures, as the organ boy becomes a musician by turning the handle of his instrument.' Antoine Claudet, 'Progress of photography', in *Transactions of the Society for the Encouragement of Art, Manufactures and Commerce*, London, 1852, 205. A similar view is expressed by Robert Hunt in the introduction to his 1841 *Popular Treatise* (the first history of photography published in England). See Robert Hunt, *A Popular Treatise on the Art of Photography*, Glasgow, 1841, iii–iv.
 - 19 Talbot, 'Some account of the art of photogenic drawing', 40–1 (emphasis in original).
 - 20 Roland Barthes, *Camera Lucida*, trans. Richard Howard, New York, 1982, 88 (emphasis in original).
 - 21 Barthes, *Camera Lucida*, 89.
 - 22 Armstrong, *Scenes in a Library*, 12–13. The status and meaning of the index has become highly debated in recent photography theory. See the collection of essays, comments, and in particular the round table discussion in *Photography Theory* in which it is suggested that the way the term index is applied to photography theory by art historians is based on a misreading of C. S. Peirce's analysis of signs. *Photography Theory*, ed. James Elkins, New York and London, 2007. See also James Elkins, 'What does Peirce's sign system have to say to art history?', *Culture, Theory, and Critique*, 44: 1, 2003, 5–22.
 - 23 Talbot's complete statement is: 'This remarkable phaenomenon, of whatever value it may turn out in its application to the arts, will at least be accepted as a new proof of the value of the inductive methods of modern science, which by noticing the occurrence of unusual circumstances (which accident perhaps first manifests in some small degree), and by following them up with experiments, and varying the conditions of these until the true law of nature which they express is apprehended, conducts us at length to consequences altogether unexpected, remote from usual experience, and contrary to almost universal belief.' Talbot, 'Some account of the art of photogenic drawing', 40 (emphasis added).
 - 24 John Herschel, *A Preliminary Discourse on the Study of Natural Philosophy*, Chicago, IL, 1987, 8, 15 (emphasis added). Herschel was a prominent 'Man of Science' and his *Discourse* is considered to be 'the epitome of the nature and ethos of early Victorian science' by historians of science. See Richard Yeo, 'Reviewing Herschel's *Discourse*', *Studies in History and Philosophy of Science*, 20: 4, 1989, 541. Herschel was closely involved in Talbot's photographic experiments and was himself the inventor of a number of photographic processes. He was also the one who suggested the term 'photography' for Talbot's early images. On the relations between the two and Herschel's photographic experiments see Larry Schaaf, *Out of the Shadows*.
 - 25 Simon Schaffer, 'Natural philosophy', in G. S. Rousseau and Roy Porter, eds, *The Ferment of Knowledge*, Cambridge, 1980, 78.
 - 26 Richard Olson has shown that Common Sense philosophy was established in Scotland in response to the philosophical work of Hume. Thus Thomas Reid's 1764 *Inquiry Into the Human Mind* was conceived to defend the religious beliefs and moral tenets of moderate Scottish Presbyterianism against the corrosive influences of atheistical scepticism on the one hand, and necessitarian materialism (as argued by David Hartley and later Joseph Priestley) on the other. Richard Olson, *Scottish Philosophy and British Physics 1750–1880*, Princeton, NJ, 1975, 27–30. Herschel's *Discourse* was also indebted to the Scottish School of Common Sense of philosophy.
 - 27 Historians of science have shown that the prevalent evocation of scientific methods by 'Men of Science' in their accounts functioned mainly as a rhetorical tool to morally and culturally promote their discoveries not to epistemologically ground their validity. See Richard Yeo, 'Scientific method and the rhetoric of science in Britain, 1830–1917', in John A. Schuster and Richard Yeo, eds, *The Politics and Rhetoric of*

- Scientific Method, Dordrecht, 1986, 260. Yeo also explains how induction was a highly inconsistent and controversial term during this time. See his 'An idol of the market-place: Baconianism in nineteenth century Britain', *History of Science*, 23, 1985, 251–298.
- 28 See for example, P. M. Harman, *Energy, Force, and Matter*, Cambridge, 1982.
- 29 Norton Wise and Crosbie Smith argue that in the 1830s and 1840s 'a fundamental change in consciousness occurred within British scientific culture' due to a conceptual and philosophical shift brought about by the rebirth of mechanics through field theory and thermodynamics: 'Over a wide range of scientific subjects the economical metaphor "economy" came to mean evolution rather than balance, temporal dynamics rather than equilibrium.' Norton Wise and Crosbie Smith, 'Work and waste: Political economy and natural philosophy in nineteenth century Britain', Part 2, *History of Science*, 27, 1989, 391–92 (392). On the centrality of the wave theory of light to this shift see Robert H. Silliman, 'Fresnel and the emergence of physics as a discipline', *Historical Studies in the Physical Sciences*, 4, 1974, 156–7.
- 30 Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences*, New York, 1994, 219.
- 31 Foucault, *The Order of Things*, 265 (emphasis in original).
- 32 The importance of Kant's philosophical revolution and his concept of the organism to Romantic aesthetic theory have been pointed out and analysed by, among others, M. H. Abrams in his seminal *The Mirror and the Lamp: Romantic Theory and the critical Tradition*, New York, 1953.
- 33 As part of his criticism of mechanical science and material theories of association Coleridge states that 'Under that despotism of the eye ... under this strong sensuous influence, we are restless because invisible things are not the objects of vision; and metaphysical systems, for the most part, become popular, not for their truth, but in proportion as they attribute to causes a susceptibility of being seen, if only our visual organs were sufficiently powerful.' Coleridge, *Biographia Literaria*, vol. 1, London, 1962, 74 (emphasis in original).
- 34 On Coleridge's theory of the imagination see Nigel Leask, *The Politics of Imagination in Coleridge's Critical Thought*, Basingstoke, 1988; Forest Pyle, *The Ideology of Imagination*, Stanford, CA, 1995.
- 35 William Whewell, *Selected Writings on the History of Science*, ed. Yehuda Elkana, Chicago, IL, 1984, 210–11. Whewell's historians, Richard Yeo and Menachem Fisch, argue that Whewell's *Philosophy* marks a break from traditional English empiricism and show that his work was partly formed in response to Coleridge's aesthetic theory. See Menachem Fisch, *William Whewell, Philosopher of Science*, Oxford and New York, 1991; Richard Yeo, *Defining Science: William Whewell, Natural Knowledge, and Public Debate in early Victorian Britain*, Cambridge, 1993.
- 36 Talbot states that 'It was during these thoughts [on the beauty of the images of the camera obscura] that the idea occurred to me ... how charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper! Such was the idea that came into my mind. Whether it had ever occurred to me before amid floating philosophic visions, I know not, though I rather think it must have done so, because on this occasion it struck me so forcibly.' William Henry Fox Talbot, 'Brief historical sketch of the invention of the art', *The Pencil of Nature*, n.p., (emphasis added).
- 37 Simon Schaffer argues that 'where natural philosophers presented their histories as methods for training practitioners in discovery ... historians of the sciences from the early nineteenth century separated the disciplined training of scientists from the heroic discovery moment, for which no training was possible.' He thus shows that the end of natural philosophy was marked by the emergence of new models of scientific discovery which came out of the shift within the philosophy of science from discovery to justification, and the institutionalization of science as a professional practice. Simon Schaffer, 'Scientific discoveries and the end of natural philosophy', *Social Studies of Science*, 16: 3, August 1986, 387, 410.
- 38 Geoffrey Batches traces the personal relationship and correspondence between Coleridge, Tom Wedgwood, and Humphry Davy in order to show how Coleridge's views on representation, in particular his insistence on the 'interactive relation between nature and the viewing subject', informed early inventors' conception of photography. Batches, *Burning with Desire*, 60–2, 84–90. See also Anne McCauley, 'Talbot's Rouen window: Romanticism, Naturphilosophie and the invention of photography', *History of Photography*, 26: 2, Summer 2002, 124–31.
- 39 On the relations between Coleridge's *Biographia* and his *Theory of Life* see Timothy Corrigan, 'The *Biographia Literaria* and the language of science', in Harold Bloom, ed., *Modern Critical Views: Samuel Taylor Coleridge*, New York, 1986. On Coleridge's *Theory of Life* see R. Male, 'The background of Coleridge's *Theory of Life*', *Studies in English*, 33, 1954, 60–8; Alice D. Snyder, *Coleridge on Logic and Learning*, New Haven, 1929.
- 40 S. T. Coleridge, *Hints towards the Formation of a more comprehensive Theory of Life*, vol. 1, New York, 1853, 386–7 (emphasis in original).
- 41 Coleridge, *Biographia Literaria*, vol. 1, 202 (emphasis added).
- 42 Abrams points to the relation between the idea of organic evolution and the imagination in *The Mirror and the Lamp*, 220–1. See also Raimonda Modiano, *Coleridge and the Concept of Nature*, Tallahassee, FL, 1985, 139–40; Thomas McFarland, *Coleridge and the Pantheist Tradition*, Oxford, 1969.
- 43 Romanticism is often identified as an important predecessor to the work of vitalist philosophers such as Henri Bergson. See Jack H. Haeger, 'Samuel Taylor Coleridge and the Romantic background to Bergson', and George Rousseau, 'The perpetual crisis of modernism and the traditions of Enlightenment vitalism: With a note on Mikhail Bakhtin', both in Frederick Burwick and Paul Douglass, eds, *The Crisis in Modernism: Bergson and the Vitalist Controversy*, Cambridge, 1992, 98–108, 15–75, respectively.
- 44 Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*, Cambridge, MA, 1990, 32.
- 45 See Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton, New York, 1994, 129–67.
- 46 Claudet, 'Progress of photography', 207–8 (emphasis added). Claudet was a French-born merchant and professional photographer who lived in London and developed a method to increase the sensitivity of the Daguerreotype plate. In his text, Claudet refers to the Daguerreotype plate in the camera obscura. Still, his observations hold for the paper negative as well, since light affects a sensitive surface made of paper or of metal in a similar manner. The difference lies in the degree of sensitiveness of the chemical solution which is applied to the surface upon which the picture is impressed, and this only determines the speed of the action of light, not the nature of the action itself.
- 47 Jonathan Crary explains that a 'decisive function of the camera was to sunder the act of seeing from the physical body of the observer, to decorporealize vision. The monadic point of view of the individual is authenticated and legitimized by the camera obscura, but the observer's physical and sensory experience is supplanted by the relations between a mechanical apparatus and a pre-given world of objective truth.' Jonathan Crary, *Techniques of the Observer*, 39–40. This model of vision collapsed, Crary argues, in the 1820s and 1830s as with the emergence of the empirical and physiological sciences of Man vision was relocated within the human body.
- 48 Thomas McFarland, 'Involute and symbol in the Romantic imagination', in J. Robert Barth and John L. Mahoney, eds, *Coleridge, Keats and the Imagination*, London, 1990, 29–57. McFarland's essay was written in response to Paul De Man's famous attack on Coleridge's definition of the 'symbol' and his defense of allegory in his 'The rhetoric of temporality', in Charles S. Singleton, ed., *Interpretation: Theory and Practice*, Baltimore, MD, 1969, 173–91.
- 49 Jonathan Culler proposes a similar argument when he attributes the shift in literary sensibilities from allegory to symbol to the shift that Foucault outlined in *The Order of Things* from natural history and classical taxonomy to new botany and biology 'in which hidden properties become the most significant and the true defining characteristics of the organism. Instead of imposing on visible relations a nomenclature which made fauna and flora moments of an allegory of order, the new organicism tries ... to establish the correspondence between exterior and interior forms which are all integral parts of the animal's essence.' Jonathan Culler, 'Literary history, allegory and semiology', *New Literary History*, 7, 1976, 262.
- 50 S. T. Coleridge, *Lay Sermons, The Collected Works of Samuel Taylor Coleridge*, vol. 6, ed. R. J. White, London and Princeton, NJ, 1972, 30.
- 51 William Henry Fox Talbot, 'The process of calotype photogenic

- drawing', in *Photography: Essays and Images*, ed. Beaumont Newhall, New York, 1980, 35 (emphasis added).
- 52 Talbot, 'The process of calotype photogenic drawing', 35 (emphasis in original).
- 53 Talbot's statement appears in *The Literary Gazette*, 1256, 13 February 1841, 108 (emphasis added).
- 54 In the 1850s the photographic image entered into a different discursive order in which its mode of production and forms of intelligibility were redefined. As Jonathan Crary states, photography became the dominant mode of visual consumption in the nineteenth century because 'it recreated and perpetuated the fiction that the "free" subject of the camera obscura was still viable. Photographs seemed to be a continuation of older "naturalistic" pictorial modes, but only because their dominant conventions were restricted to a narrow range of technical possibilities (that is, shutter speeds and lens openings that rendered elapsed time invisible and recorded objects in focus). But photography has already abolished the inseparability of observer and camera obscura, bound together by a single point of view, and made the new camera an apparatus fundamentally independent of the spectator, yet which masqueraded as a transparent and incorporeal intermediary between observer and the world.' Jonathan Crary, *Techniques of the Observer*, 133–6.
- 55 Talbot, *The Pencil of Nature*, n.p.
- 56 In an extraordinary review of *The Pencil of Nature* the reviewer emphasized the singularity of photographic images. His complete statement reads: 'It cannot be understood that these are veritable *Phœbi labors* [sun pictures] — that no two are exactly alike, and that to copy them surpasses all human ingenuity, inasmuch as they are a transfer to paper of the masses and tracery of light and shade by a means utterly inimitable by the ordinary resources of Art.' *The Art-Union*, 8: 91, June 1846, 143 (emphasis added).
- 57 Deleuze, *Difference and Repetition*, 15.
- 58 See Carol Armstrong's analysis of Anna Atkins's botanical albums in her *Scenes in a Library*, 179–276; see also her 'Cameraless', 87–165.
- 59 Armstrong, *Scenes in a Library*, 207.
- 60 Armstrong, 'Cameraless', 93 (emphasis in the original).
- 61 In his essay on method Coleridge opposes botany as a science that is based on artificial classification and on the conception of nature as a sensible product to chemistry as a science of dynamic creativity and pure potentiality. Chemistry is the model for Coleridge's romantic conception of science and for the philosopher as a complementary figure to the poet. See S. T. Coleridge, 'Essays on the principles of method' in *The Friend I*, *The Collected Works of Samuel Taylor Coleridge*, vol. 4, ed. Barbara E. Rooke, London and Princeton, NJ, 1969, 470–1.
- 62 Rosalind Krauss, 'A note on photography and the simulacral', in Carol Squiers, ed., *The Critical Image*, Seattle, WA, 1990, 24 (emphasis in original).
- 63 Krauss, 'A note on photography and the simulacral', 24.
- 64 Deleuze, *Difference and Repetition*, 57 (emphasis in original).
- 65 See Jacques Rancière, *The Politics of Aesthetics*, trans. Gabriel Rockhill, London and New York, 2004, 7–45.