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## 29. STAGING DARWIN'S SCIENCE THROUGH BIOGRAPHICAL NARRATIVES

### INTRODUCTION

Darwin has been the subject of many published biographies (e.g. Desmond & Moore, 1991; Browne, 1995, 2003) and, as a prolific correspondent (see Chapter 3), offers extensive personal material with which to build a biographical reading of his life, his science and the landscapes in which he developed his ideas. It has been suggested that Charles Darwin's story is 'the story of an era' (Browne, 1995, p.xiii) and as such offers educators a platform for learners to engage with scientific ideas throughout his life, and to appreciate the 'power of place' (Browne, 2003) written into his scientific identity. This chapter proposes a biographical model for using the work of scientists in teaching science. It will draw on the writings of Hustak and Myers (2013), Avraamidou and Osborne (2009), Browne (2005), Szybek (1999) and Bruner (1986, 2004) in developing a narrative-based approach through which to stage Darwin's science. In so doing it will build on Browne's assertion that, 'the material grounds of lived experience provide an avenue of historical access extending beyond the reaches of textual evidence' (Browne, 2005, p. 273).

### SCIENTIFIC BIOGRAPHY

Söderqvist (2007, p. 2) laments the lack of research attention given to the cultural impact of scientific biography, and poses two critical questions for science education: how has scientific biography contributed to (1) 'the recruitment and socialisation of young scientists' and (2) 'the self-understanding and formation of scientists, engineers and clinicians'? If biographical narratives are to be used in ways that inspire young scientists, or at the very least engender greater interest in school science, then it is necessary to reflect on how these life-stories are constructed, in order to avoid scenarios in which the narrative is 'not a biography, but a laboratory report on a specimen that seems never to have been alive' (Shalin, 1963, p. 27). Lemke situates these issues of relevance in a wider culture of what he terms the 'mystique of science':

In teaching the content of the science curriculum, and the values that often go with it, science education, sometimes unwittingly, also perpetuates a certain harmful 'mystique of science'. That mystique tends to make science seem

dogmatic, authoritarian, impersonal and even inhuman to many students. It also portrays science as being much more difficult than it is, and scientists as being geniuses that students cannot identify with. It alienates students from science. (Lemke, 1990, p. xi)

Building on Lemke's work, Avraamidou and Osborne (2009) present the case for the use of narratives in science education 'as a way of making it meaningful, relevant, and accessible' (p. 1704). In this chapter, I will frame two biographical narrative-based approaches to Darwin-inspired learning:

- Using Boehm's statue of Darwin in the Natural History Museum, London to stage his science as one which bridged 'the lab-field border'. (Kohler, 2002, p. 1)
- Bringing Darwin, the kinaesthetic scientist, alive through his personal correspondence.

#### *Visual Representation and Scientific Biography*

Fara has eloquently critiqued the privileging of textual over visual evidence in biographical contexts; in so doing she asserts the value of portraiture:

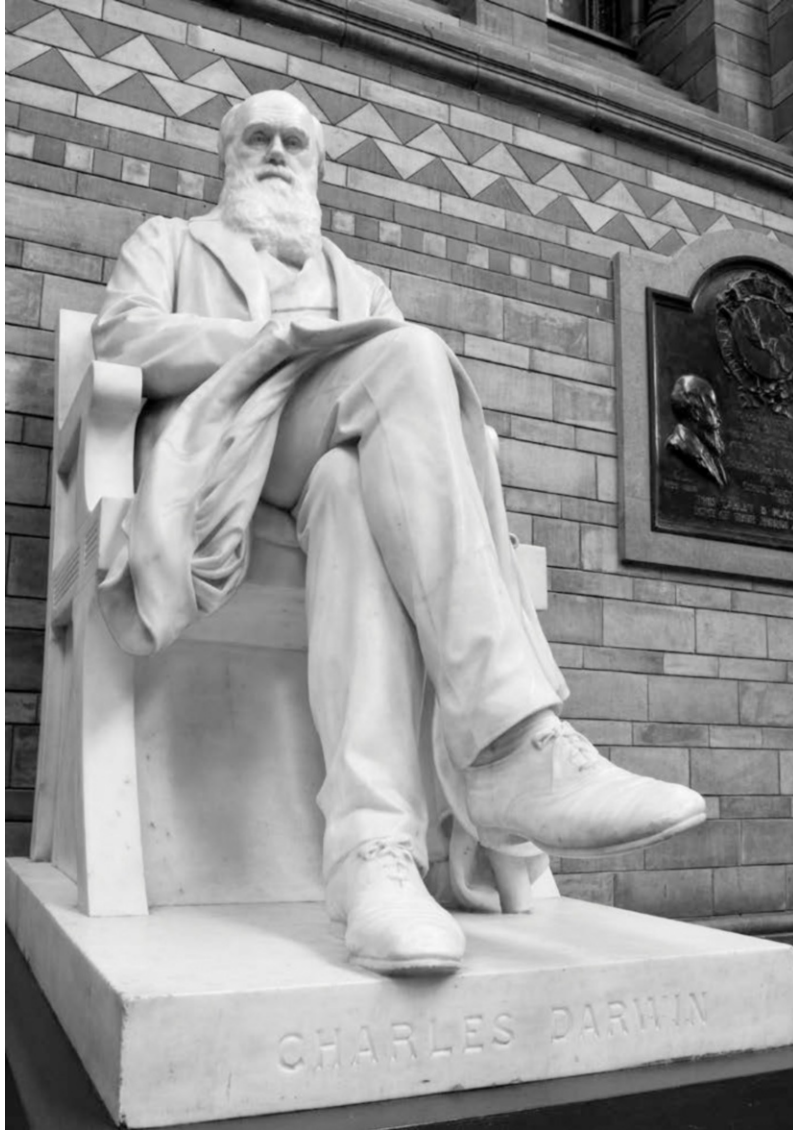
Despite being unable to offer the unmediated insights into character that some authors would like to derive, portraits can – like texts and other sources – yield unique information about a sitter. They are instructive not because of what they *do* show, but also because they are imbued with assumptions of what *should* be shown or concealed. (Fara, 2007, p. 73)

In the case of Darwin, Fara notes that his personal responses to commissioned portraiture have survived (Fara, 2000) and thus we know that Darwin disliked the portrait he received as a present on his 64<sup>th</sup> birthday because he felt the image presented him 'as a very venerable, acute, melancholy old dog' (Fara, 2000, p. 143). Likewise, Darwin considered a photographic '*cartes de visite*' to portray him as 'atrociously wicked' (Fara, 2007, p.76). Browne (2003) points out he did, however, feel more positive about another portrait, for use with family and friends, in which he was dressed in fashionable 'Great Exhibition' check trousers, albeit both portrait and response were as a younger man. In this chapter I will focus mainly on one representational portrait of Darwin – the seated, full body statue in the central hall of the Natural History Museum, London (see [Figure 1](#)).

I have chosen this statue for three reasons: it is in a public museum and therefore accessible to regular viewings by a broad range of visitors; it is extensively used in the museum-learning programme<sup>1</sup>; and specific elements of this statue can be interpreted as representations of Darwin's science out-of-doors<sup>2</sup>.

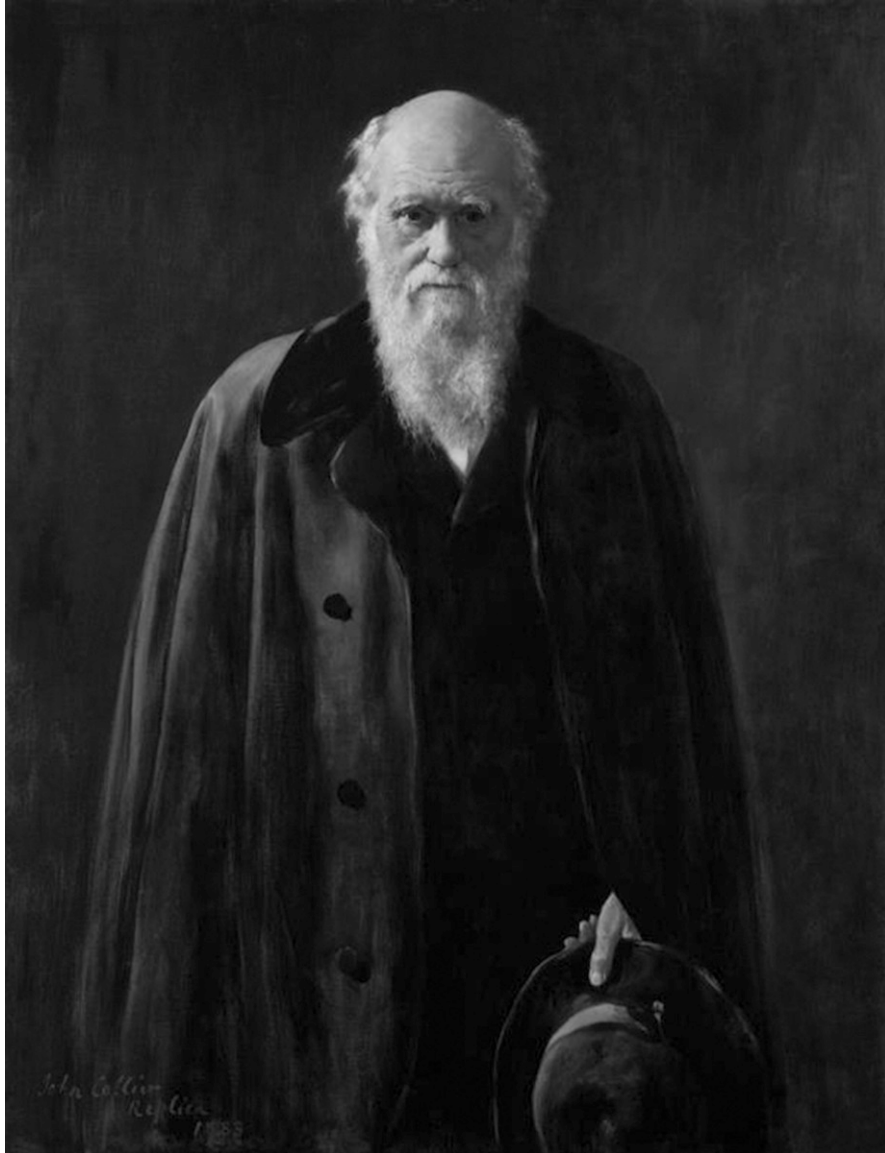
In her discussion of scientific biography and portraiture, Fara (2007) focuses our attention on Collier's painting of 1881 (see [Figure 2](#)) with its large swathes of dark clothes, in a setting devoid of books and scientific instruments, as a 'reflective and intimate' (p. 87) study of Darwin. In contrast, the statue by Joseph Boehm,

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*Figure 1. Boehm's statue of Darwin. (© The Trustees of the Natural History Museum, London)*

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*Figure 2. Collier's portrait of Darwin. (© The National Portrait Gallery, London)*

unveiled in 1885 (Figure 1), is replete with symbols of Darwin's active scientific self: the overcoat lain across his lap, the creased walking shoes, the possibilities that his notebook, a magnifying lens and other scientific accoutrement could be in one of his pockets. Darwin's chair, in this representation, with its cushion behind his back, embodies both the domestic intimacy of Down House and, at the same time, symbolises the study in which he theorised from his outdoor experiences. His eyes are contemplating distant horizons and his hands intertwined. Thus, this three dimensional portrait presents Darwin in a different light, one in which scientific knowledge is staged as 'rooted in the soil of individual experiences of, and in, the world ... and preceded by bodily experiences in particular situations' (Szybek, 1999, p. 28). In using such a representation of Darwin the man and Darwin the scientist, students' 'horizon of expectations' (Szybek, 1999, p. 157)<sup>3</sup> regarding his biography can be enlarged by 'looking at the modalities and relationships which are there, as well as by looking at what is absent' (Szybek, 1999, p. 140). In this, Darwin's statue both shows an individual and 'yet simultaneously' reveals 'the face of science itself' (Fara, 2007, p. 79). In terms of portraiture, however, there is an interesting twist to this narrative – Collier's original painting, commissioned by The Linnean Society and completed in 1881, was observed from the living man, whereas Boehm's sculpture is a posthumous commission possibly inspired by a photograph taken by Leonard of his father at Down House in 1874 (Browne, 2005). Both representations focus on ordinary day clothes, potential walks and thus opportunities for science out-of-doors, and both position Darwin's eyes contemplating middle to far distant views – inferring outdoor landscapes as the inspirational source of his science.

#### *A Sensory and Tactile Science*

Darwin's letters and many of his books are filled with sensory and tactile language, orientating his scientific life around verbs and adjectives, rather than solely, as is often the case with scientific texts, a noun-based 'arrested universe' (Martin, 1993). He was, as has been stated by several authors, aware of the need to use the tools of communication used by novelists and poets to bring his scientific ideas to a readership subscribing to such literary resources as Mudie's travelling library (Otis, 2002; Browne, 2003). This is especially the case for *On the origin of species*, which uses analogy and metaphor to engage his popular audience with his 'big idea'. As a nineteenth-century scientist, Darwin occupies a specific place in the cultural milieu of his time and the history of science. Boehm's statue holds many narrative possibilities with which to imagine Darwin's scientific life. The scale of the statue and its prominent position – at the top of a staircase overlooking the central hall of the museum – provides opportunities to look in detail at the 'small stories' (Bamberg & Georgakopoulou 2008) often obscured by the 'grand narrative' (Lyotard, 1984) of Darwin as the 'father of evolution'. For example, we can look closely at his hands and consider his letter to Hooker: 'After having been so many years employed in writing my old geological observations it is delightful

to use one's eyes and fingers again<sup>74</sup>. His shoes, in Boehm's statue, are creased and worn – the shoes of a man who walked regularly, indeed Browne, (2005) observes the 'lovingly wrought' shoelaces as those of a 'naturalist waiting to go for a walk' (p. 265). In Collier's painting too we have an image of Darwin in which 'ordinary-ness' is exemplified – 'No scholarly gown, no classical toga, the usual symbols of intellect and wisdom' (Browne, 2005, p. 265) a man in his overcoat, fingers wrapped round the brim of his hat; 'ready to go for a walk' (Browne, 2005, p. 265). We see recognition of the walking scientist in Moore's chapter in which he states, for Darwin 'to walk, however, was to think' (see Chapter 7, p. 94). Selles observes that students walking in the same places in Brazil as young Darwin were motivated to 'search for their own stories, to deal with their memories, and to discover themselves as part of history' (see Chapter 6, p. 75). We can imagine Darwin and Miss Thorley on their hands and knees counting and identifying plants in Great Pucklands meadow while we read the report of scientists attempting a similar survey in the twenty-first century. Through these narratives students can reflect on the situational science embodied in such everyday clothing.

Darwin's overcoat, as depicted in Boehm's statue and in Collier's painting, suggests a man for whom science was not practised solely indoors, a man whose garden was part of his life and science: 'Darwin became at the end what he had always been in his heart, almost part of nature himself, a man with time to lean on a spade and think, a gardener' (Browne, 2003, p. 480). In our book, Chapters 2 (The World of Downe), 27 (Transformation of the School grounds) and 10 (Sailing the Backyard *Beagle*) situate Darwin's science at Downe. This overcoat represents a scientific life lived out-of-doors, a creative doorway through which students can begin to build an understanding of Darwin's experience of *being* a scientist (see Chapter 4). The many pockets of possibilities in his waistcoat, jacket and overcoat in Boehm's rendition, although not visibly explicit, allow students to imagine their contents, as Darwin metaphorically sailed his 'scientific ship' (Browne, 1995, p. 530) across the grounds at Down House and beyond. What 'random odds and ends were creatively assembled into problem-solving tools' (see Chapter 10) for his science. Might a strand of Emma's hair or even a bit of old toenail reside in these temporary stores of everyday objects awaiting a scientific task? Moreover, we can ask students to imagine how Darwin used these objects in his 'multisensory experiments' (Hustak and Myers, 2013 p. 94) as discussed by Costa (see Chapter 10).

Staging Darwin's life and science through portraiture challenges educators to consider the possibilities of experiencing scientists beyond 'life as a noun' (Martin, 1993, p. 221), perhaps enabling science educators, as Avraamidou and Osborne (2009) suggest, to 'forge a stable plane between scientific and non-scientific speech' (Montgomery, 1996, p. 52), embodied in the 'small stories' (Bamberg & Georgakopoulou, 2008, p. 377) of diverse scientific lives, both historic and modern. Portraiture, whether it be in paint, print or carved stone, offers students a setting which 'makes us see the person in a specific way, it makes the person specific' (Szybek, 1999, p. 60) and, in the case of Boehm's portrayal of Darwin, represents

science as 'enacted' (Szybek, 1999, p. 208) in an 'affective ecology that also includes the scientist' (Hustak & Myers, 2013, p. 94); thus, science is represented as an essentially human endeavour rather than the actions of seemingly distant geniuses from which students can, and often do, feel alienated.

#### DARWIN'S HANDS

Darwin's hands have received somewhat prejudicial attention from a range of interested spectators, both within and beyond familial contexts. For example, in his book *Celebrated Hands*, Claude Warren writes, next to a traced sketch of Darwin's hands:

Darwin is rather a large man, and his hand is not a large one in proportion. It is hard and rough, (the right one most so), very spatulous, and rather hairy, with knotty fingers; the lines are numerous and confused. It is a very interesting hand to those studying 'fingerology', for instance compare it with that of an artist, or, of a man devoid of reasoning power. (Warren, 1881)

Although Boehm's sculpture was, in general, well-received, the hands were much critiqued:

Concerning the statue itself, we have only to speak in terms of almost unqualified praise. It is, in the truest sense of the phrase, a noble work of art. The attitude is not only easy and dignified, but also natural and characteristic; the modelling of the head and face is unexceptionable, and the portrait is admirable. The only criticism we have to advance has reference to the hands, which not only do not bear the smallest resemblance to those of Mr. Darwin, but are of a kind which, had they been possessed by him, would have rendered impossible the accomplishment of much of his work. Although this misrepresentation is a matter to be deplored, it is not one for which the artist can be justly held responsible. Never having had the advantage of seeing Mr. Darwin, Mr. Boehm has only to be congratulated upon the wonderful success which has attended his portraiture of the face and figure; the hands were no doubt supplied by guess-work, and therefore we have only to regret that the guess did not happen to be more fortunate. (*Popular Science Monthly*, 1885, p. 533)

Family memories have inscribed Darwin's hands as 'large, long and pointed' (Keynes, personal communication) suggesting that the Tissot cartoon from *Vanity Fair* (see [Figure 3](#)) best fits that view (Keynes, personal communication). Perhaps, the aforementioned criticism of Boehm's rendition of Darwin's hands is not simply a question of scale but an aesthetic consciousness imbued with associations of profession, and thereby social class, commonplace amongst affluent Victorians. Such distinctions could produce rich debate between students studying Darwin in their science lessons and Victorian Britain in history.



*Figure 3. 'Natural Selection'-a caricature of Darwin in the magazine Vanity Fair, 30 September 1871 by James Tissot.*

#### SCIENTIFIC OBSERVATION

The essence of Darwin's scientific 'persona' (Daston & Sibum, 2003) was his use of continuous and critical observation using simple microscopes and lenses in combination with asking timely questions as a 'powerful heuristic' (Eberbach & Crowley, 2009 p. 43). In two letters to Hooker in November 1846<sup>5</sup> and 1 May 1847<sup>6</sup>, Darwin describes how delighted he is with his 'splendid plaything' – his new microscope. In a long and detailed letter to Richard Owen in March 1848, Darwin eulogises on the effectiveness of his new microscope made by Smith and Beck and asks Owen to recommend such a 'simple microscope' if he is 'consulted by any young naturalist'. Darwin is forthright in his feelings for his new microscope, for which he feels 'quite a personal gratitude', and his old one, for which he holds 'quite a hatred'<sup>7</sup>. This same microscope, as described in the letter to Owen, allows him to observe in detail colour changes in the valves of



a barnacle (see further discussion in Chapter 20). In writing to John Herschel, Darwin notes:

The borders of the valves when a slice is scaled off are of a very fine blue colour, but which colour, (& this is the point) on slight pressure instantly changes into a translucent red like the clouds of sunset. It is curious under the microscope to press it with a needle & see spot after spot assume this fine permanent glow of red.<sup>8</sup>

Thomashow reflects on 'the learning pathways of the naturalist sensibility' (2002, p. 83). He suggests the following pathways are implicit to the naturalist practice:

- Collecting and systematising as a means of organising knowledge of the natural world.
- Striving to ascertain patterns in nature.
- Being a passionate explorer.

In addition to these 'learning pathways', Thomashow characterises what he defines as 'the deliberate gaze' in which 'wonder, intent and consideration' are combined using sensory awareness, detailed scientific observation and imagination – 'interconnected approaches' which he considers 'crucial for observing the natural world' (Thomashow, 2002, pp. 82-83). In defining these learning pathways and approaches, Thomashow (2002) argues for 'a place-based perceptual ecology' (p. 73) in which 'proximity and attentiveness' (p. 75) thrive. Darwin's letters, concerning the joy of using his 'simple microscope' and the sensory mapping of his observations in the example of the barnacle valve, present an attentive and proximal view of the natural world. Moreover, Darwin's detailed descriptions of his experiments with weeds, orchids, insectivorous plants, barnacles and pigeons demonstrate his 'kinaesthetic dexterities' and 'an experimental form of life contoured by both love and violence' (Hustak & Myers, 2013, p. 93).

These life contours are exemplified by his letter to Hooker, concerning his 'Pigeon Fancy', in which Darwin says he now has 'pairs of nine very distinct varieties, & I love them to the extent I cannot bear to kill and skeletonise them'<sup>9</sup>, although, in reality, he did just that; 'The most tangible relic of Darwin's time as a pigeon-fancier was his set of dismembered skeletons and the dried skins of representative specimens. His pets had become data ready to be turned into ammunition' (Browne, 2003, p. 205) and see [Figure 4](#).

Jerome Bruner (2004) suggests that, 'narrative, even at its most primitive, is played out on a dual landscape'. These two landscapes he describes as one of action 'on which events unfold' and a second landscape 'of consciousness, the inner worlds of the protagonists involved in the action' (p. 698). The extensive archive of Darwin's letters, books and notebooks (see Chapters 3 and 8), along with the preservation of his house and garden at Downe, allow access to these dual narratives. An intensely documented history in which we find a man whose



Figure 4. A selection of Darwin's pigeons. (© The Trustees of the Natural History Museum, London)

scientific method 'refuses to emulate the idealized model of a disengaged, impartial, scientific observer. He participated actively with his experimental subjects, to such an extent that he moved with and was moved by them' (Hustack & Myers, 2013, p. 85). Using a range of artefacts, spaces and places through which to imagine Darwin's life separates 'learning to be a scientist' from 'learning science' (Bruner, 1986, p. 132). Thus, it becomes 'learning a culture, with all the attendant non-rational meaning-making that goes with it' (Bruner, 1986, p. 132). Such acts of imagination (Bruner, 1986) can create 'epiphanies of the ordinary' (Bruner, 2004; Joyce, 1914) rather than the 'mythic and allegorical' (Daston & Sibum, 2003, p. 7) lives so often characterised by school science. Furthermore, the multi-vocal language with which he voices the first edition of *On the origin of species* is, in Beer's words 'expressive rather than rigorous':

He accepts the variability within words, their tendency to dilate and contract across related senses, or to oscillate between significations. He is less interested in singleness than in mobility. In his use of words he is more preoccupied with relations and transformations than with limits. (Beer, 2009, p. 33)

Thus, through Darwin's words, we have a richly *sensed* scientific life from which to develop a narrative-based approach to learning science.

## ACKNOWLEDGEMENTS

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## NOTES

- <sup>1</sup> 'The Great Debate Workshop (KS4 14-16-year-olds) at The Natural History Museum plunges students into the heated debate surrounding the publication of Darwin's *On the origin of species*. With the main galleries as their stage, watch as your students become animated proponents of the historic protagonists' views' (Sally Collins, pers. Comm. Natural History Museum, London).
- <sup>2</sup> On May 6, 2009 Janet Browne gave a Burlington House Lecture entitled 'Two hundred Years of Evolution: Celebrating Charles Darwin in 2009'. During her lecture she suggested elements of Boehm's statue, such as the inclusion of an overcoat, could be taken as representations of Darwin's science out-of-doors. Since attending this lecture I have accessed her 2005 presidential address 'Commemorating Darwin' for the British Society for the History of Science.
- <sup>3</sup> Szybek draws on the theoretical works of Husserl and Merleau-Ponty to inform his work on 'Staging Science'.
- <sup>4</sup> Charles Darwin to J. D. Hooker, 6 November, 1846. Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-1018> accessed on 24 November 2013.
- <sup>5</sup> Charles Darwin to J. D. Hooker, 14 November, 1846. Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-1024> accessed on 24 November 2013.
- <sup>6</sup> Charles Darwin to J. D. Hooker, 1 May, 1847. Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-1085> accessed on 24 November 2013.
- <sup>7</sup> Charles Darwin to Richard Owen, 26 March, 1848. Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-1166> accessed on 14 October 2013.
- <sup>8</sup> Charles Darwin to John Herschel, 11 May, 1848. Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-1175> accessed on 14 October 2013.
- <sup>9</sup> Charles Darwin to J. D. Hooker, 8 November, 1855. Darwin Correspondence Database, <http://www.darwinproject.ac.uk/entry-1774> accessed on 24 November 2013.

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