JEWELS OF THE NATURAL HISTORY MUSEUM: GENDERED AESTHETICS IN SOUTH KENSINGTON, C. 1850-1900

PANDORA KATHLEEN CRUISE SYPEREK

PH.D. HISTORY OF ART

UCL

I, PANDORA KATHLEEN CRUISE SYPEREK confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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ABSTRACT

Several collections of brilliant objects were put on display following the opening of the British Museum (Natural History) in South Kensington in 1881. These objects resemble jewels both in their exquisite lustre and in their hybrid status between nature and culture, science and art. This thesis asks how these jewel-like hybrids – including shiny preserved beetles, iridescent taxidermised hummingbirds, translucent glass jellyfish as well as crystals and minerals themselves – functioned outside of normative gender expectations of Victorian museums and scientific culture. Such displays' dazzling spectacles refract the linear expectations of earlier natural history taxonomies and confound the narrative of evolutionary habitat dioramas. As such, they challenge the hierarchies underlying both orders and their implications for gender, race and class. Objects on display are compared with relevant cultural phenomena including museum architecture, natural history illustration, literature, commercial display, decorative art and dress, and evaluated in light of issues such as transgressive animal sexualities, the performativity of objects, technologies of visualisation and contemporary aesthetic and evolutionary theory. Feminist theory in the history of science and new materialist philosophy by Donna Haraway, Elizabeth Grosz, Karen Barad and Rosi Braidotti inform analysis into how objects on display complicate nature/culture binaries in the museum of natural history. The aim of this study is to go beyond dichotomised interpretations of the role of gender in science and museology in order to present a more nuanced and at times chaotic picture of sexual relations as reflected in late nineteenth-century scientific and material culture. By considering the spaces in between art and science, natural theology and evolution, taxonomy and naturalism, masculine and feminine, different, sometimes queer, configurations of gender emerge in the displays of the Natural History Museum.

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1.18 Alfred Waterhouse, Natural History Museum, front façade, east wing (detail): pterodactyl, 1881.

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1.24 Alfred Waterhouse, Natural History Museum, front façade, east wing (detail), 1881.

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1.44 Case Illustrating Adaptation of Colour to Surroundings, Index Museum, 1895. Photograph: K Marion Reynolds. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

1.45 Case Illustrating Adaptation of Colour to Surroundings, Index Museum, 1895. Photograph: K Marion Reynolds. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

1.46 Case Illustrating Albinism in Index Museum, 1895. Photograph: K Marion Reynolds. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

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2.2 The Couttet Rose-Fluors. Natural History Museum, London.

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3.11 Coral Gallery, Natural History Museum, 1882. Photograph: Anthony Gepp. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

3.12 'Curious Objects Often Seen on the Sea-Shore at Low Water', in *Harper's Weekly* (11 Sept. 1858), 592.

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3.31 Leopold and Rudolf Blaschka, Drawing of jewellery from sketchbook, date unknown. Rakow Library Archives, Corning Museum of Glass.

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4.5 Blackbird display, c. 1875-81. Natural History Museum, London.

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4.23 Gould Hummingbird collection. Natural History Museum, Tring.

4.24 John Everett Millais, *The Ornithologist* (also known as *The Ruling Passion*), 1883. Oil on canvas. Glasgow Museums: Kelvingrove Art Gallery and Museum.

4.25 James Abbott McNeill Whistler, *Harmony in Blue and Gold: The Peacock Room*, 1877. Freer Gallery of Art, Smithsonian Institution.

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4.30 M&E Natté, Fan (detail), 1880s. Stuffed bird, feathers, wrapped silk, ivory, glued beetle. V&A.

4.31 Flower spray, 1894. Wire, silk, Coppery-headed emerald humming bird feathers and beetle wings. V&A.

4.32 Harry Emanuel, earrings, c. 1865. Bird heads, mounted in gold, with red glass eyes. V&A.

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4.38 'A Bird of Prey'. *Punch* (14 May 1892).

4.39 John Gould, Hummingbird Display: *Chlorostilbon atala*, with case painted black, c. 1909. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

4.40 George Cruikshank, *Humming-birds – or a Dandy Trio*, published 15 July 1819. Hand-coloured etching on paper. Art Institute Chicago.

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5.4 Buprestid (jewel beetle), handled by Malcolm Kerley, curator of coleoptera. Natural History Museum, London.

5.5 Buprestid (jewel beetle), handled by Malcolm Kerley, curator of coleoptera. Natural History Museum, London.

5.6 Nest of a Wasp, date unknown. Photograph: F.J. Kent, 1908. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

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5.21 Late Victorian necklace set in nine carat gold with nine beetles. Private collection.

5.22 Late Victorian necklace set in nine carat gold with nine beetles (detail). Private Collection

5.23 Earrings, c. 1850. Tortoise beetles on gilt metal leaves. V&A.

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5.29 Edward Linley Sambourne, *Next Hideous 'Sensation Chignon'*, *Punch* (30 Nov. 1867).

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5.33 Streeter & Co., Brooch, c. 1870. Gold. British Museum.

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5.37 Alice Comyns Carr, Robe for Ellen Terry, 1888. Smallhythe Place.

5.38 Alice Comyns Carr, Beetle Wing Dress for Ellen Terry (detail), 1888. Smallhythe Place.

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5.43 Carl Kauba, desk ornament, c. 1905. Bronze. Anderson Collection of Art Nouveau. Univerity of East Anglia.

5.44 Carl Kauba, desk ornament, c. 1905. Bronze. Anderson Collection of Art Nouveau. Univerity of East Anglia.

5.45 René Lalique, *Dragonfly Woman*, corsage ornament, c. 1897-98. Gold, enamel, chrysoprase, moonstones and diamonds. Calouste Gulbenkian Museum, Lisbon.

5.46 René Lalique, *Dragonfly Woman*, corsage ornament, c. 1897-98. Gold, enamel, chrysoprase, moonstones and diamonds. Calouste Gulbenkian Museum, Lisbon.

5.47 Fleas and plague display, 1927. Photographer unknown. NHM Archives. Courtesy of the Trustees of the Natural History Museum (London).

6.1 'Dippy' the Diplodocus skeleton cast, central hall, 2014. Natural History Museum, London.

6.2 Artist's projection of blue whale skeleton in the Hintze Hall (formerly Central Hall), 2015. Courtesy of the Trustees of the Natural History Museum (London).

6.3 Darwin Centre, 2009. Natural History Museum, London.

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6.6 Goshka Macuga, *Sleep of Ulro*, 2006. Mixed media. A Foundation, Liverpool.

6.7 Goshka Macuga, *Sleep of Ulro* (detail: fungi and orchids), 2006. Mixed media. A Foundation, Liverpool.

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6.10 Goshka Macuga, *Objects in Relation*, 2007. Mixed media. Tate.

6.11 David Altmejd, *The Index*, 2007. Steel, foam, wood, glass, mirror, Plexiglas, lighting system, silicone, resin, taxidermy birds and animals, synthetic plants, synthetic tree branches, bronze, fibreglass, paint, burlap, leather, pinecones, horse hair, synthetic hair, chains, wire, feather. Art Gallery of Ontario.

6.12 Robert Smithson, *Corner Mirror with Coral*, 1969. Museum of Modern Art, New York.

6.13 David Altmejd, *The Giant 2*, 2007. Foam, wood, glass, mirror, Plexiglas, resin, silicone, taxidermy birds and animals, synthetic plants, paint, pinecones, burlap, chains, wire, feathers, quartz, pyrite, jewellery, beads, glitter. Stuart Shave/Modern Art, London.

6.14 David Altmejd, *Le ventre*, 2012. Plexiglas, resin, coconut shells, chain, thread, acrylic paint, metal wire. Stuart Shave/Modern Art, London.

6.15 Kate MccGwire, *Skirmish*, 2015. Mixed media with pheasant feathers in antique dome. Courtesy of the artist.

Gendering Brilliant Objects in the Natural History Museum

> The multitude have no eyes for the mammals. They rapidly pass by those eldest-born of the globe. They find them cold and damp. They mount towards the light, towards the mass of brilliant objects. Mother-of-pearl, butterflies' wings, feathers of birds – these are the things which charm.[1]
>
> Jules Michelet, *The Sea*, 1861

> I will sing a spectacle worthy of your admiration, though of things minute.[2]
>
> Virgil, 'Georgics IV', c. 29 BCE

Today when one thinks of the natural history museum, the objects that are most likely to come to mind are dinosaur bones, or casts of dinosaur bones, mounted to create a skeletal dramatisation of those ancient giants. This in itself draws attention to a legacy of masculinism in museums of natural history, owing to such objects' 'macho' associations: specimens that are large, male or gendered male are frequently given centre stage in natural history exhibitions.[3] 'Dippy' the diplodocus skeleton cast who has resided in the central hall of London's Natural History Museum for almost four decades is a case in point, but 100 years before 'he' was installed, Museum founder Richard Owen envisioned superlative specimens in the very same place, which would impress with their bulk, height and weaponry.[4] However, these are subjects for a different study.[5] While fossils

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[1] Jules Michelet, *The Sea* (1861), trans. W.H. Davenport Adams, London: T. Nelson & Sons, 1875), 118.

[2] Virgil, 'Georgics IV' (c. 29 BCE), in *The Works of Virgil Translated into English Prose*, trans. C. Davidson, vol. 1 (London: Geo. B. Whittaker et al, 1826), 148.

[3] See Rebecca Machin, 'Gender Representation in the Natural History Galleries at the Manchester Museum', *Museum and Society* 6.1 (Mar. 2008), 54-67. Also see Donna Haraway, 'Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936', *Social Text* 11 (winter 1984-85), 20-64; and Sally Gregory Kohlstedt, 'Nature by Design: Masculinity and Animal Display in Nineteenth-Century America', in Ann B. Shteir and Bernard Lightman, eds, *Figuring It Out: Science, Gender, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2006), 110-39. Machin points out that despite *Tyrannosaurus rex's* masculine name, the females were likely larger than males. Machin, 63.

[4] 'Dippy, *NHM website* <http://www.nhm.ac.uk/visit-us/galleries/green-zone/hintze-hall/dippy/index.html> (accessed 30 July 2015); 'Richard Owen, *Index Museum. Report by the Superintendant of Natural History* (British Museum (Natural History) (19 July 1880), 4, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

and remains of large prehistoric creatures as well as sizeable existing animals surely excited Victorian museum-goers as well as staff, a wealth of contemporary literature indicates the fascination smaller, more exquisite objects held for the museum visitor of the late nineteenth century. A newspaper preview of the opening of London's new Natural History Museum on Easter Monday, the 18 April 1881 stated:

> Fossils, most highly interesting to contemplate as they are as relics of former organic creations of the past ages of the world, are not so attractive to the eye of the artist or of the mass of mankind as birds, beasts, and fishes in all their completeness of form and beauty of various coloured skins, plumage, or glistening scales.[6]

As the Natural History Museum's first director, Owen conceded to the particular aesthetic value of certain types of specimens and hence their prevalence in natural history collections:

> Many animal forms do indeed accord with our apprehension of the Beautiful; some classes more especially, as e.g. that of birds, also the pearly shells in which molluscs "attend soft nutriment", the diversely-ramified or delicately-sculptured corals – all these are strikingly beautiful, and accordingly are the exemplifications of animated nature which are the first to be collected, and are usually the most extensively illustrated in museums.[7]

It is such 'brilliant objects', as French historian Jules Michelet titled the beautiful but small crowd-pleasers of natural history collections, that form the subject of this thesis. Specifically, I examine four collections that were installed in the galleries of the Natural History Museum in London following its opening in 1881 – minerals curated by John Ruskin, marine invertebrate models by the glassmakers Leopold and Rudolf Blaschka, hummingbird cases mounted by John Gould and beetles and butterflies collected by Alfred Russel Wallace and others – and the circumstances of their collection, creation and display. The focus on the contexts in which these – like all objects in the Museum – were selected, worked, preserved or modelled, refutes the myth that collections of natural history can ever

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[5] On fossils, see Martin J.S. Rudwick, *The Meaning of Fossils: Episodes in the History of Paleontology* (New York: Elsevier, 1972); Rudwick, *Scenes from Deep Time: Early Pictorial Representations of the Prehistoric World* (Chicago: University of Chicago Press, 1992); and W.J.T. Mitchell, 'Romanticism and the Life of Things: Fossils, Totems, and Images', *Critical Inquiry* 28.1 (autumn 2001), 167-84. On dinosaurs, see W.J.T. Mitchell, *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago: University of Chicago Press, 1998). On large mammals, see Karen Wonders, *Habitat Dioramas: Illusions of Wilderness in Museums of Natural History* (Uppsala: Almqvist and Wiksell, 1993); and Haraway, 'Teddy Bear Patriarchy'.

[6] 'The New Natural History Museum', source unknown (16 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

[7] Richard Owen, *On the Extent and Aims of a National Museum of Natural History* (London: Saunders, Otley and Co., 1862), 10-11.

be simply presented as found in nature. Even the display of these objects highlights their connection to the broader culture. Lists of '[m]other-of-pearl, butterflies' wings, feathers of birds' and 'various coloured skins, plumage, or glistening scales' suggest that more than a collection for scientific learning, natural history museums comprised a material archive with connections to other cultural institutions such as art and design museums – in the Natural History Museum's case, the next door South Kensington Museum[8] – and the department store.

Thus, the objects considered here are not only 'jewel-like' in their exquisite brilliance, but equally in their position in between nature and culture. As such, they are well suited for interrogating the relationship between the Museum and related cultural phenomena and the resulting implications for aesthetics.[9] The few major studies of the Natural History Museum – or British Museum (Natural History) as was its official title until 1992[10] – have focussed on the institution's scientific, social and even architectural histories while for the most part ignoring its broader cultural impact and influences.[11] However, to neglect these relationships is to enforce a dichotomy between art and science that has largely been imposed in hindsight. Through analysis of the interlinking of popular natural history display and other more self-consciously aesthetic arenas, other relevant binaries in late nineteenth-century culture can be examined, for example between

[8] Renamed the Victoria and Albert Museum in 1899.

[9] While some feminist philosophers such as Elizabeth Grosz have rejected the term 'aesthetics' due to its associations with Kantian and Hegelian exclusivity, the alternative term 'poetics' does not cover the array of discourse nor the historical specificity of the material this thesis addresses. My thanks to Peg Rawes for her elucidation of Grosz's usage and its ramifications regarding the Western philosophical canon. Rawes, personal email (15 July 2015). On the aesthetic in relation to nineteenth-century thought, see Terry Eagleton, *The Ideology of the Aesthetic* (1990), cited in Caroline Arscott, *William Morris and Edward Burne-Jones: Interlacings* (New Haven: Yale University Press, 2008), 134.

[10] 'Natural History Museum' is used throughout this study, as the moniker most commonly used throughout the institution's history and to avoid confusion and awkwardness.

[11] See A.E. Günther, *The Founders of Science at the British Museum 1753-1900* (Halesworth, UK: Halesworth Press, 1980); British Museum (Natural History), *Nature Stored, Nature Studied: Collections, Conservation and Allied Research at the Natural History Museum* (London: British Museum (Natural History), 1981); P.J.P. Whitehead and Colin Keates, *The British Museum (Natural History)* (London: Philip Wilson in association with the British Museum (Natural History); William T. Stearn, *The Natural History Museum at South Kensington: A History of the British Museum (Natural History) 1753-1980* (London: Heinemann, 1981); Mark Girouard, *Alfred Waterhouse and the Natural History Museum* (London: Natural History Museum, 1999); Susan Snell and Polly Tucker, *Life Through a Lens: Photographs from the Natural History Museum 1880-1950* (London: Natural History Museum, 2003); Richard A. Fortey, *Dry Store Room No. 1: The Secret Life of the Natural History Museum* (London: Harper Press, 2008); and John Thackray and Bob Press, *Nature's Treasurehouse: A History of the Natural History Museum* (London: Natural History Museum, 2013).

religion and evolutionism. The displays examined here equally straddle these paradigms and their most closely corresponding orders of exhibition – taxonomy and naturalism, respectively. These dazzling but liminal spectacles are imbued with more drama than is expected of earlier natural history tabulations and yet lack the narrative context of evolutionary habitat dioramas. As such, they challenge the hierarchies underlying both orders and their implications for gender, race and class.[12]

The hierarchy examined here primarily concerns gender. Given these brilliant objects' challenging position in between nature and culture, science and art, religion and evolution, in this thesis I explore how these objects might have been gendered. I consider this question firstly in light of the objects' distinction from those that harbour masculinist associations, whether through emphasis on male specimens and masculinity in exhibitions or the privileging of male-dominated scientific discourses; and secondly in regards to the feminine associations of related cultural forms, including women's craft traditions suggested by the Museum's architectural associations with the Arts and Crafts movement, feminised shopping culture evoked by both the architecture and the design of the displays, and the resemblance of the objects themselves to women's jewellery. However, rather than reiterate another dichotomy, that between masculine science and feminine decoration, here these forms are recognised as complex and in constant interchange. The purpose of this study is therefore to examine what kinds of unexpected gender configurations such analysis might lead to.

Doing Away with Dichotomies

To consider the collections of the Natural History Museum as on a continuum with other cultural institutions is to contradict what Susan Pearce has called 'that

[12] Donna Haraway has noted 'some important inadequacies in feminist analysis which has proceeded as if the organic, hierarchical dualisms ordering discourse in 'the West' since Aristotle still ruled. … The dichotomies between mind and body, animal and human, organism and machine, public and private, nature and culture, men and women, primitive and civilized are all in question ideologically.' Haraway, 'A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century', in *Simians, Cyborgs and Women: The Reinvention of Nature* (London: Free Association, 1991), 163.

great distinction at the heart of early museology'.[13] It was in fact the 'convenient and rational division' between human artefacts and natural objects that the Natural History Museum's first guidebook claimed warranted the collection's removal from the British Museum in Bloomsbury.[14] The guide defined natural history as 'the processes or laws of the Universe, and the results of the action of those processes or laws upon the materials of which it is composed, *which are independent of the agency of man*'.[15] And yet the collections included items – for example, ornaments and jewellery made from natural materials, but also models, worked stones and taxidermised animals – that inherently complicate this distinction. That this history has continued to be suppressed indicates not only an absence in the literature but also the upholding of a false dichotomy.

Despite the surge of critical museum studies that arose in the 1980s and 90s with the so-called 'new museology', for many years, when looking outside art collections, critical investigations into museums have usually focussed on archaeological or ethnographic collections, especially in critiques of power relations based on gender and race between colonial collectors and subjugated people 'on display'.[16] Of the few major critical studies of natural history museums some have examined the colonial histories of natural collections, again maintaining a humanist focus on how the objects contained within act as extensions of populations and cultures, whether exhibiting or exhibited.[17] Others have focussed on exhibitions of evolution, which invariably narrate a teleological trajectory to the endpoint of modern human.[18] In either case, these often fall within the boundaries of the history of science more than the history of art; likewise, the relatively recent field of museum studies frequently draws on practices more aligned with the social sciences than the humanities.

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[13] Susan Pearce, ed., 'Introduction', in *Interpreting Objects and Collections* (London: Routledge, 1994), 1.
[14] William Henry Flower, *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1886), 15.
[15] Flower, *General Guide*, 15. Emphasis in original.
[16] See, for example, Ivan Karp and Steven D. Lavine, eds, *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington, DC: Smithsonian, 1991); Annie E. Coombes, *Reinventing Africa: Museums, Material Culture and Popular Imagination in Late Victorian and Edwardian England* (New Haven: Yale University Press, 1994); and Barbara Kirshenblatt-Gimblett, *Destination Culture: Tourism, Museums, and Heritage* (Berkeley: University of California Press, 1998).
[17] John MacKenzie, *Museums and Empire: Natural History, Human Cultures and Colonial Identities* (Manchester: Manchester University Press, 2009); Susan Sheets-Pyenson, *Cathedrals of Science* (Kingston and Montreal: McGill-Queens University Press, 1988).
[18] Monique Scott, *Rethinking Evolution in the Museum: Envisioning African Origins* (New York: Routledge, 2007).

In Amy K. Levin's edited volume *Gender, Sexuality and Museums*, a very welcome addition to the field, only two essays, a small fraction of the extensive reader, are dedicated to 'The Nature of Gender'.[19] Rebecca Machin's case study of the Manchester Museum's natural history galleries reproduced here conducts careful statistical analysis of gender representation in the animal specimens on display and documents her curatorial interventions which drew attention to imbalances and sexist rhetoric within the permanent exhibition.[20] As such, it provides an important consideration of the historical legacy of sexism maintained within non-human collections today, building on Donna Haraway's influential 1985 essay 'Teddy Bear Patriarchy'. Haraway's landmark critique of racialised and gendered narratives instilled in the taxidermy dioramas of the American Museum of Natural History in the early years of the twentieth century is particularly notable for its emphasis on the role of aesthetics and the politics of vision mobilised in natural history display practice and its Western colonialist legacies.[21]

While Haraway and Machin deconstruct gendered hierarchies in natural history display, identifying the privilege accounted to formidable male mammals – gorillas, in Haraway's case – and birds, they stop short of analysing their marginalised counterparts: specimens small in stature, 'lower' life forms and the non-animal. The question of how these objects might have been differently gendered, and how this is integrally tied in with aesthetic considerations forms the key line of enquiry of my thesis. A thorough analysis of gender in the natural history museum requires consideration of its less readily anthropomorphic objects – both non-human and non-animal. Albeit jokingly, Machin laments, 'A museum will never, of course, be able to display a male, female and juvenile of each species, in some kind of pseudo-Ark.'[22] However, this upholds a heteronormative standard that simply does not apply to many objects of natural history: inorganic rocks and crystals, marine invertebrates that reproduce through asexual and hermaphroditic means, hummingbirds which eschew pair bonding and insects whose life cycles present a radical departure from mammalian modes of

[19] Amy K. Levin, ed. *Gender, Sexuality, and Museums: A Routledge Reader* (Abingdon, UK: Routledge, 2010).
[20] Machin, 54-67.
[21] Correspondingly, albeit not specifically focussed on gender, Karen Wonders' in-depth study of habitat dioramas traces taxidermy and the diorama, or habitat group, to aesthetic origins. Wonders, *Habitat Dioramas*.
[22] Machin, 63.

parenting. Furthermore, imbalanced representation is but one example of biases demonstrated in natural history museums. Other more complex forms of gendering can be exposed through analysis of the objects and displays with the acknowledgement that these are themselves cultural artefacts, in order to establish their relationships to the broader culture.

The dialectic with which this introduction began – between dusty old bones and bright and shiny things – speaks to an aesthetic hierarchy that has been absorbed in natural collections, between the seriousness associated with the former and flippancy with the latter. The historical subjugation of conspicuous beauty and its realm of the senses to detached positivism accords with what feminist critique has argued is an inherent polarisation along gendered lines within the history of science. In her classic *Reflections on Gender and Science*, Evelyn Fox Keller argues that the scientific values of objectivity and rationalism have been historically typecast as masculine qualities in the face of feminine subjectivity and emotion.[23] As such, nature becomes the feminised and passive object to the active male scientific subject. In its detached autonomy, science is therefore characterised as 'antithetical to eros', paradoxically sexless yet highly masculine.[24] And yet, sexual metaphor abounds in scientific thought, from tropes of 'unveiling nature' by 'men of science' to the division and subordination of the 'soft sciences', based in what is inferred as insubstantial feeling, to the unyielding objectivity and 'hard facts' of science 'proper'.[25] The very classifications that form the foundations of modern science are based in sexual difference, such as the attribution of male and female sexual traits to plants and the centrality of breasts to the classification of mammals, both contributions of Linnaean taxonomy that remain ingrained aspects to this day.[26] Even the supposedly most basic units of

[23] Evelyn Fox Keller, *Reflections on Gender and Science* (New Haven: Yale University Press, 1985), 78-79.
[24] Keller, 78.
[25] Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), 202; Keller, 77. On unveiling as a sexual metaphor, also see Ludmilla Jordanova, *Sexual Visions: Images of Gender in Science and Medicine Between the Eighteenth and Twentieth Centuries* (Madison, WI: University of Wisconsin Press, 1989), 55 and *passim*.
[26] Londa Schiebinger, *Nature's Body: Gender in the Making of Modern Science* (Boston: Beacon, 1993), 40-65, 11-37. Lorraine Daston writes, 'Natural historical nomenclature is a convention that aspires to the permanence of nature itself.' Daston, 'Type Specimens and Scientific Memory', *Critical Inquiry* 31 (autumn 2004), 154. Also see Lynda Birke, *Feminism, Animals and Science: The Naming of the Shrew* (Buckingham, PA: Open University Press, 1994).

life of sperm and egg were subject to gender stereotypes of respective activity and passivity, in an epitomising example of Victorian anthropomorphism.[27]

The myth of scientific progress through increasing objectivity by the end of the nineteenth century is counteracted by such examples of Victorian ideology's impact on scientific thought. Extensive critique of social prejudice shaping evolutionary thought has particularly been waged against Charles Darwin.[28] Biases running through evolutionary theory have equally been subject to scrutiny within museological critique, while institutional paradigms that echo these scientific hierarchies have been identified, for example in Tony Bennett's critique which portrays the museum as a paternalistic agent impressing on a passive feminised public.[29] And yet such sweeping characterisations of the museum, as of science, are based in dichotomous terms, and may reiterate gender essentialism. The corresponding narrative that envisions an increasingly masculinised science defined by evolutionism, mechanical observation and specialisation replacing the former order of natural theology and popular natural history collecting practices is especially complicated within the museum (and especially the Natural History Museum in London), where multifarious beliefs were illustrated through the objects on display.[30] Lorraine Daston and Peter Galison have demonstrated how in the second half of the nineteenth century, scientific objectivity was increasingly distinguished – and elevated – from the subjectivity that now came to be associated with art.[31]

But what if one dismantles the very terms of subject and object? In her essay 'Situated Knowledges' on feminism and science studies, Haraway challenges the very assumption that 'an "object" of knowledge is a passive and

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[27] Patrick Geddes and J. Arthur Thomson, *The Evolution of Sex* (London: Walter Scott, 1889), 35-40. For critiques, see Biology and Gender Study Group, 'The Importance of Feminist Critique for Contemporary Cell Biology', *Hypatia* 3.1 (spring 1988), 61-76; and Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge: Harvard University Press, 1989), 11-12.

[28] For example in J. Conway 'Stereotypes of Femininity in a Theory of Sexual Evolution', in M. Vicinus, ed., *Suffer and Be Still: Women in the Victorian Age* (Bloomington: Indiana University Press, 1973), 140-54; Evelleen Richards, 'Darwin and the Descent of Women', in David Oldroyd and Ian Langham, eds, *The Wider Domain of Evolutionary Thought*, vol. 2 (Dordrecht, NL: D. Reidel, 1983), 57-111; Rosemary Jann, 'Darwin and the Anthropologists: Sexual Selection and Its Discontents', *Victorian Studies* 37.2 (winter 1994), 287-306; Ruth Hubbard, 'Have Only Men Evolved?' in Ruth Hubbard, Mary Sue Henifen and Barbara Fried, eds, *Women Looking at Biology Looking at Women: A Collection of Feminist Critiques* (Boston: GK Hall, 1979), 7-36; and Flavia Alaya, 'Victorian Science and the "Genius" of Woman', *Journal of the History of Ideas* 38 (1977), 261-80.

[29] Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995).

[30] See, for example, Barbara T. Gates and Ann B. Shteir, *Natural Eloquence: Women Reinscribe Science* (Madison: University of Wisconsin Press, 1997), 17.

[31] Daston and Galison, 246.

inert thing' and the corresponding characterisation of the subject as 'that single ordering point of will and consciousness'.[32] This underlying polarisation and corresponding historical dichotomies between science and art, evolution and religion, nature and culture, male and female are all called into question through an examination of the aesthetic, non-human and gendered dimensions of the Natural History Museum. The irreducibility of nature-culture reflects the breakdown of the dialectic of subject and object, both signalling the need to consider gender beyond the constructivist model. According to Haraway, the spectatorial role is implicitly aligned with culture – being outside of nature – and masculinity: 'Man is not in nature partly because he is not seen, is not the spectacle. A constitutive meaning of masculine gender for us is to be the unseen, the eye (I), the author.'[33] These words, admittedly written thirty years ago, risk reinscribing the dialectic they critique. However, they also synopsise the point that runs throughout Haraway's early writing on gender and science, that vision as an embodied practice is key to breaking down the binary constructs concerning gender and nature.[34] They therefore denote the need for visual critique when addressing these constructs within the spectacular forum of the natural history museum.

The Unnatural History Museum

The proliferation of critical museum literature that emerged in and around the 1990s is frequently characterised by similar limitations as social constructivist critiques of gender and science. In *The Birth of the Museum*, Bennett acknowledges that the narrativisation of the museum's trajectory from the supposedly jumbled incongruity of the cabinet of curiosities to a rational space of truth and order is based in rhetoric of modernist progress – this echoes Michel Foucault's characterisation of the 'new field of visibility' of the natural sciences

[32] 'That judgement seems bizarre to me. I prefer to call this generative doubt the opening of non-isomorphic subjects, agents, and territories of stories unimaginable from the vantage point of the cyclopian, self-satiated eye of the master subject.' Donna Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in *Simians, Cyborgs, and Women: The Reinvention of Nature* (London: Free Association, 1991), 197, 192.
[33] Haraway, 'Teddy Bear Patriarchy', 52.
[34] Haraway, 'Situated Knowledges', 195.

in the nineteenth century as one characterised by restricted vision.[35] Bennett argues that the history of the museum needs to be considered in relation to the development of a range of collateral cultural institutions, including fairs, libraries and public parks, pointing out that natural history museums shared a network of animal collecting with circuses, menageries and dime museums, for example those run by P.T. Barnum.[36] Emphasising the museum as a spatial regime and ultimately disciplinary apparatus that impresses on its public with its performative 'evolutionary excersizes of the self', the natural history counterpart to Carol Duncan's influential critique of the art museum as a ritual space, Bennett considers the racial, class and gendered dimensions of how the passage of deep time was inscribed onto the museum's 'progressive subjects'.[37]

However, Bennett's Foucauldian critique of the panopticonic 'machine for progress' – its title a direct reference to Foucault's *Discipline and Punish: The Birth of the Prison* – comes off as a monolith in and of itself.[38] Not only does it position the museum-going public as 'empty vessels waiting to be filled with ideology',[39] but it also ignores the complexity of the very notion of public. Samuel Alberti complicates the classification of museum collections as either 'private' or 'public', since historical modes of ownership cover a spectrum between these poles, and the terms themselves are fluid, contingent as they are on varying contexts of gender and class.[40] Alberti demonstrates how the transference of personal to institutional collections did not always run smoothly or take one form, but reflects an important shift in civic life over the course of the nineteenth century that constituted a wholly new conception of the term 'public', as we understand it today.[41] This shift can be witnessed in the Natural History Museum's division of its collections into study-series and exhibition-series.[42]

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[35] Bennett, *Birth*, 2; Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (1966) (London: Routledge, 1989), 144.
[36] Bennett, *Birth*, 5.
[37] Bennett, *Birth*, 10, 179; Carol Duncan, *Civilizing Rituals: Inside Public Art Museums* (London: Routledge, 1995).
[38] Bennett, *Birth*, 23, 10.
[39] Carla Yanni, *Nature's Museums: Victorian Science and the Architecture of Display* (New York: Princeton Architectural Press, 2005), 9.
[40] Samuel Alberti, 'Owning and Collecting Objects in Nineteenth-Century Britain', in Marco Beretta, ed., *From Private to Public: Natural Collections and Museums* (Sagamore Beach, MA: Science History Publications, 2005), 141.
[41] Alberti, 'Owning and Collecting', 152-53.
[42] Initially effected by British Museum keeper of zoology John Edward Gray, soon after the department was made separate in 1856, this process was under way prior to Richard Owen's involvement and the move to South Kensington. Albert Günther, *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 2: *Separate Historical*

Critiques such as Alberti's demonstrate the shortfalls of addressing 'the museum' as a totalising institutional regime, ignoring the heterogeneous realities of its various histories. Even within a single institution – the Natural History Museum being a prime example of the museum's heterogeneity – a complex, frequently contradictory web of interests, investments and influences emerge. The estrangement of the natural history museum from its cabinet of curiosity or *wunderkammer* predecessor has generally been viewed as accompanying a shift in philosophy that privileges sceptical incredulity over the glorification of the strange and marvellous, marking a new episteme in Foucauldian terms, or paradigm shift according to Thomas Kuhn.[43] The origins of the Natural History Museum, not unusually, were based in Hans Sloane's Enlightenment collection of the 'rare and curious', a legacy with which its Victorian directors and keepers had to grapple.[44] But the manners in which they approached this were far from streamlined.

Although the division of the Natural History Museum from the British Museum is testimony to the increasing distinction of science from art over the course of the late nineteenth century, this process was never direct or linear but changeable and comprised much overlap. One must ask how the scientific ideal of mechanical objectivity, with its supposed denial of the senses, translated into the insistently sensory, but in particular visual realm of the museum.[45] Daston and Galison have posited as an alternative to Foucault's unified historical self a set of 'diametrically opposed' selves, one scientific and one artistic.[46] And yet this dualism is inherently problematised by objects and displays in the Natural History Museum such as glass models made with jeweller's techniques, dioramas testifying to the 'art of taxidermy' and even the colourful stained glass, decorative ceiling tiles and extensive sculpture programme of the architecture. Haraway even

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Accounts of the Several Collections Included in the Department of Zoology (London: British Museum (Natural History), 1906), appendix, 2.

[43] Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150-1750* (New York: Zone Books, 1998), 5; also see Horst Bredekamp, *The Lure of Antiquity and the Cult of the Machine: The Kunstkammer and the Evolution of Nature, Art, and Technology*, trans. Allison Brown (Princeton, NJ: Markus Wiener, 1995); Foucault, *passim*; Thomas Kuhn, *The Structure of Scientific Revolutions* (1962), 3rd edn (Chicago: University of Chicago Press, 1996), *passim*.

[44] Flower, *General Guide* (1886), 7.

[45] Alberti notes that towards the end of the nineteenth century, museums attempted to phase out non-visual experiences as much as possible. Alberti, 'The Museum Affect: Visiting Collections of Anatomy and Natural History', in Aileen Fyfe and Bernard Lightman, eds, *Science in the Marketplace: Nineteenth-Century Sites and Experiences* (Chicago: University of Chicago Press, 2007), 387.

[46] Daston and Galison, 199.

argues that a 'craft of killing' underlies the collection of specimens.[47] Despite the alleged ideal of detached analysis, judgements of species and specimens' beauty abound throughout the Museum's guidebooks of the late nineteenth century.[48] Such examples of visual pleasure attributed to objects external to art or even human manufacture inform the expanded notion of aesthetics formulated in this thesis.

Furthermore, reflections on the appeal of the Museum's collections by Richard Owen and others quoted earlier prioritise the artist, the collector and 'the mass', further complicating Bennett's critique of faceless institutional power: holding these varied stakeholders in mind, museums necessarily departed from a unitary regime of rational display and progressive science. Collectors, like artists, both benefitted from use of the collections and literally contributed to them, thus shaping the collections both as valued visitors and as active contributors. The complex resulting network of interests behind the collections defies the idea of museum's unidirectional power. Like the close interplay between popular and professional naturalism throughout the Victorian period, religious and evolutionary interests intermingled in the museum: museums of natural history, London's most famously, were variously labelled 'cathedrals of science' or 'temples of nature' in the late nineteenth century.[49] Carla Yanni has argued that religion was fundamental to their formation, claiming that its polarisation with science is a twentieth-century construct.[50] The dialectic between the religious interests behind Owen's founding of the Natural History Museum and the evolutionist beliefs of those who succeeded him has been oversimplified, and overstated in assessments of the architecture, as I will argue in chapter 1. Throughout, this thesis examines the visual properties of displays that emerge out of evolutionary influences on the Museum, from more sculptural layouts in galleries to interactive habitat dioramas, rejecting the myth that evolution eschewed aesthetics.

Instead of the sway science held on art in the later nineteenth century, the focus on which imposes its own hierarchical order, in this thesis I set out to invert this popular line of enquiry by investigating the reverberations of visual and material cultural in natural history display. The past decade has seen a surge of

[47] Haraway, 'Teddy Bear Patriarchy', 23.
[48] These judgements largely disappear by the early twentieth century.
[49] Wonders, 10.
[50] Yanni, 10, 62.

research into the 'less dramatic, or marketable',[51] non-human realm of science/art crossovers, including several thematic monographs and anthologies on topics ranging from germ theory to evolution, and especially regarding natural and sexual selection in and following Charles Darwin's bicentenary in 2009.[52] However, less investigation has been made into natural history objects as aesthetic 'works' in and of themselves. Ironically, in the Anglo-American sphere literary scholars have led the way in evaluating the visual culture of Victorian natural history and evolution.[53] But more research on objects as primary materials, rather than literary sources, is called for. Other important contributions to the visual analysis of scientific objects employ methodologies more aligned with the history of science than of art.[54] In contrast, while artworks and the history of science form integral aspects of the analysis, this study primarily invokes art historical methods to examine scientific objects.[55]

Primitive and exotic, wild and non-Western, museums of natural history have been positioned as at once othering and othered. The inclusion of human artefacts in some is clearly problematic, for relegating a large part of the world's human population to the realm of nature and its 'status of static being'[56] – anonymous, decontextualised and ahistoric, compared with Western civilisation's narrative of progress. As Mieke Bal has argued in her critique of the American Museum of Natural History, even the institution itself becomes other to the art museum, nature to its culture. Bal outlines a hierarchy with the fine art museum at the top, signifying the modern Western individuated subject, and the zoo, 'that

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[51] Mary Hunter, 'Science Uncovered', review of Jennifer Tucker, *Nature Exposed* and Barbara Lawson, *The Dark Side of Nature*, *Oxford Art Journal* 32.1 (Mar. 2009), 154.
[52] See Lynn Gamwell, *Exploring the Invisible: Art, Science, and the Spiritual* (Princeton, NJ: Princeton University Press, 2002); Barbara Larson, *The Dark Side of Nature: Science, Society, and the Fantastic in the Work of Odilon Redon* (University Park, PA: Pennsylvania State University Press, 2005); Diana Donald and Jane Munro, eds, *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (New Haven: Yale University Press, 2009); Pamela Kort and Max Hollein, eds, *Darwin: Art and the Search for Origins*, exh. cat. (Frankfurt: Schirn Kunsthalle, 2009); Barbara Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009); Barbara Larson and Sabine Flach, eds, *Darwin and Theories of Aesthetics and Cultural History* (Aldershot, UK: Ashgate, 2013).
[53] See, for example, Jonathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006); and Kate Flint, *The Victorians and the Visual Imagination* (Cambridge: Cambridge University Press, 2000).
[54] See, for example, Nick Hopwood, *Haeckel's Embryos: Images, Evolution, and Fraud* (Chicago, University of Chicago Press, 2015); and Julia Voss, *Darwin's Pictures: Views of Evolutionary Theory, 1837-1874*, trans. Lori Lantz (London: Yale University Press, 2010).
[55] Throughout italics are used for specimens and title case for galleries, to indicate their treatment as cultural and architectural works.
[56] Mieke Bal, 'Telling, Showing, Showing Off', in *Double Exposures: The Subject of Cultural Analysis* (New York: Routledge, 1996), 15.

even more "natural" museum', at the bottom.[57] And yet, in light of nineteenth-century geological and evolutionary findings, the natural history museum also instils history, albeit one of deep time. Bennett sees different museum types as chapters within a longer story, with one leading to the next.[58] According to him, the narrative machinery into which these new old pasts are organised comes to instantiate an ideology of progress in which modern human, or man specifically, is telos.[59] Rather than through the othering representation of ethnographic artefacts as nature, this, he argues, is achieved through the bodily and mental performance of the visitor in relation to the evolutionary narrative of exhibition design.[60] In his 2004 book *Pasts Beyond Memory*, Bennett expands his notion of the natural history museum fostering an 'archaeological gaze' in which layers of culture emulate geological stratification, resulting in a stratified self that is exclusive to modern Western man.[61] Correspondingly, John MacKenzie writes that modern imperial transgressions of geographical frontiers were echoed in the deep past represented in the museum, collapsing spatial and chronological considerations.[62] Thus, the art museum and the natural history museum worked in tandem, both as 'heterotopias of indefinitely accumulating time'.[63] Just as high culture in the museum was attributed the capacity to transform the inner lives of the public, nature in the museum was believed to restore a lost equilibrium in the population of post-industrial urban society.[64] Hence, while natural history specimens were ideally intended to merely illustrate didactic texts, they also embodied expectations of an auratic function, much like art objects.[65]

Although the Natural History Museum did not hold ethnography collections, with many of its specimens constituting human artefacts its

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[57] Bal, 20.
[58] Bennett, *Birth*, 181.
[59] Bennett, *Birth*, 179, 39.
[60] Bennett, *Birth*, 179.
[61] Bennett, *Pasts Beyond Memory: Evolution, Museums, Colonialism* (London: Routledge, 2004), 6, 88, 94.
[62] MacKenzie, 6-7. It is notable that most of the objects I analyse derive from non-European sources.
[63] Michel Foucault, 'Of Other Spaces', *Diacritics* 16 (spring 1986), 26, quoted in Bennett, *Birth*, 1.
[64] Bennett writes that Cuvier's Gallery of Comparative Anatomy in the Jardin des plantes, Paris, provided an 'accessible utopia' (quoting Dorinda Outram) and a 'visualization of nature's order and plenitude that could serve as a refuge from the outside turmoils of revolution'. Bennett, *Birth*, 185.
[65] Quoting George Brown Goode, W.H. Flower wrote, 'A well-arranged educational museum has been defined as a collection of instructive labels illustrated by well-selected specimens'. Flower, 'Museum Organisation': Presidential Address to the British Association for the Advancement of Science, Newcastle-on-Tyne (11 Sept. 1889), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 18.

collections maintained a dialogue with those on display across the road at the South Kensington Museum – which in turn possessed an extensive collection of 'Animal Products'.[66] Given that museums of natural history were connected to other types of museum both through an epistemological continuum and the types of objects they contained, how did these different institutions interface? While cabinets of curiosities preceded the collections that would come to form museums, the world's fair and specifically the Great Exhibition of 1851, both in its architecture and exhibition design, integrally informed the shape they would take, physically and ideologically. Thus, beyond the 'organized walking through evolutionary time' instilled in the visitor's experience of displays of cultures at varying stages of development, the Great Exhibition, which included a large proportion of geological and zoological displays, imbued in the museum associations with commodity and commodity fetishism.[67] Art historian Donald Preziosi has called the Crystal Palace 'the unconscious of every museum in the world', claiming that the Great Exhibition's universalizing tendency 'endows everything (as the effective condition of its visibility in modernity) with a phallicized, commodified, and fetishized value, making it evident that at the core of modernity is precisely the conflation of aesthetics, ethics, and sexuality in the commodity'.[68] While this conflation has been examined extensively in relation to museums of art, these processes of desire and visuality in manufacturing the modern gaze also apply to museums of natural history.

Equally connected to the commoditised and spectacular displays of the world's fair was the department store, on which the Great Exhibition also exercised profound influence. Shops and their windows were compared to universal exhibitions, as representing 'triumphs of art and manufacture'.[69] But like the exhibition, they also operated through what literary scholar Brian Nelson calls 'the seduction of pure spectacle, the seduction of the eye through an almost

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[66] These were moved to the Bethnal Green Museum in 1872, potentially indicating an attempt to separate natural and cultural collections. For details of the collections, see Peter Lund Simmonds, *The Commercial Products of the Animal Kingdom Employed in the Arts and Manufactures Shown in the Collection of the Bethnal Green Branch of the South Kensington Museum* (London: Eyre and Spottiswoode, 1880); and Anthony Burton, *Vision and Accident: The Story of the Victoria and Albert Museum* (London: V&A, 1999), 45, 50-52.

[67] Bennett, *Birth*, 186; P.A. Morris, 'The Development of Bird Taxidermy', in *A History of Taxidermy: Art, Science and Bad Taste* (London: MPM, 2010), 54.

[68] Donald Preziosi, *Brain of the Earth's Body: Art, Museums, and the Phantasms of Modernity* (Minneapolis: University of Minnesota Press, 2003), 99.

[69] *Queen* (26 Mar. 1864), 239, quoted in Erika Rappaport, Shopping for Pleasure: Women in the Making of London's West End (Princeton, NJ: Princeton University Press, 2000), 118.

orgiastic display of visual pleasures'.[70] Thus, they likewise constituted 'the site of nineteenth-century sexual attitudes and class relations', as did the museum.[71] As a sanctified urban space for bourgeois women, the department store opened up a unique feminine public forum, in the face of discourse and legislation enforcing the naturalisation and domesticity of femininity.[72] Here, historian Judith Walkowitz writes, 'women safely reimagined themselves as *flâneurs*, observing without being observed, constructing dreams without being obliged to buy'.[73] Courting a female audience, museums followed this model. Bennett argues that due to associations with nature and domesticity, female visitors provided a sanitising agent to such public institutions.[74] In contrast, I am concerned with how female participation imparted associations of pleasure on the objects displayed within. In Émile Zola's novel *Au Bonheur des Dames* (1883), a chronicle of the development of the department store and thereby of modern capitalism, dizzying descriptions of endless reams of sumptuous, colourful fabrics poured over by female clientele parallel writers' inventorying of natural surfaces in the museum.[75] The experience of objects in the Natural History Museum induced the 'phantasmagoria' Walter Benjamin associated with commodity culture and its 'luster of distraction' as much as other modern urban consumer experience.[76]

Jewels in South Kensington

It is against this backdrop and set of concerns that I investigate the gendering of objects in the formation of London's Natural History Museum. While the primary focus is on the collections of jewel-like objects on display, chapter 1 introduces

[70] Brian Nelson, 'Introduction', in Émile Zola, *The Ladies' Paradise* (1883), ed. and trans. Brian Nelson (Oxford: Oxford University Press, 1995), xi.
[71] Nelson, x.
[72] Rappaport, 5; Bennett, *Birth*, 29-30. Lynda Nead challenges the notion that women's only entry point into public life in the city was through shopping, while Christopher Breward challenges the notion that shopping culture was exclusive to women. Nead, *Victorian Babylon: People, Streets and Images in Nineteenth-Century London* (New Haven: Yale University Press, 2000), 68; Breward, *The Hidden Consumer: Masculinities, Fashion and City Life 1860-1914* (Manchester: Manchester University Press, 1999), 1.
[73] Judith Walkowitz, *City of Dreadful Delight: Narratives of Sexual Danger in Late-Victorian London* (London: Virago, 1992), 48. Also see Janet Wolff, 'The Invisible Flâneuse: Women and the Literature of Modernity', *Theory, Culture, and Society* 2.3 (Nov. 1985), 37-46.
[74] Bennett, *Birth*, 30.
[75] Zola, *passim*.
[76] Walter Benjamin, 'Paris, the Capital of the Nineteenth Century' (1935), in *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin, ed. Rolf Tiedemann (Cambridge, MA: Belknap Press, 1999), 7.

the context for these collections through the Museum's architecture and its purpose-built Index Museum, which comprised the large central hall that is one of the building's most distinguishing features. Taking the statues of Richard Owen and Charles Darwin that were placed at either end of this expansive space as its starting point, the chapter considers how the purportedly warring factions of religious natural history and evolutionism, represented respectively by these formidable figures, played out in the architecture and exhibition design of the Natural History Museum as well as how they complicated them. The obsolescence of the religious tinged architecture of the 'cathedral to nature' and especially its nave-like Index Museum under the new evolutionary regime of the late nineteenth century forms a well-worn narrative.[77] The quirky, even eccentric architecture has been viewed as a throwback to an earlier faith-based model of natural history, one which relied heavily on amateur practice including by female naturalists, and thus as creating a stumbling block for the proponents of increasingly professionalised – and masculinised – science by late century.[78] However, analysis of the heterogeneous manifestations of the beliefs of Owen and his evolutionist successor William Henry Flower in their respective museum practices dismantles such a straightforward reading of scientific progress and its gendered implications. I argue that contemporary criticisms of the architecture were as much due to their aesthetic resonances as to their scientific suitability. Preziosi writes that the architecture of the Crystal Palace embodies modern symbolic order: 'infinitely expandable, scaleless, anonymous, transparently and stylelessly abstract'.[79] The Natural History Museum marks the antithesis of this description. Instead, its architecture is itself jewel-like in its embellished intricacy, as characterised by the extensive programme of animal sculpture, as well as ornamental ceiling tiles depicting botanical specimens and colourful stained glass. These features connect the neo-Gothic building to contemporary design movements such as the Pre-Raphaelites and nascent Arts and Crafts movement and suggest that criticism might have derived from the architecture's modernism rather than its obsolescence. Meanwhile, the evolutionary displays that came to fill the Index Museum under Flower were marked by a mounting concern for visual and public appeal that connects to the exploding culture of women's

[77] See Stearn, 56-63.
[78] See J.B. Morrell, 'Professionalisation', in R.C. Olby et al., *Companion to the History of Modern Science* (London: Routledge, 1990), 980-89.
[79] Preziosi, 96.

shopping. The trajectory of this intended microcosm of the Museum thus reverses expectations of its displays in relation to gender. Like the architecture, this chapter sets up a paradoxical framework within which to examine the collections, one which complicates the central binary of natural theology and evolutionism and its implications for gender in the museum.

Following the first chapter's demonstration of the need for re-evaluation of the institution and its displays in light of related aesthetic culture, chapter 2 examines the art critic and social theorist John Ruskin's involvement in the Natural History Museum through his curation and donations in the Mineral Gallery. In comparison to geology's grand narratives of the earth's movements over deep time, mineralogy, the study of discrete fragments of inorganic matter, suggests an arcane exquisiteness that seems anachronistic in late nineteenth-century natural history. Perhaps it is then unsurprising that mineralogy was the chosen field for Ruskin to apply his unique brand of aesthetics. While geology, especially as outlined by Charles Lyell in the early 1830s, is seen as setting the foundations for evolutionary theory of the later century, Ruskin's involvement in the Natural History Museum encapsulates a vision of stones that defies the consequent narrative of the deep past as well as the futuristic synthetic potential of chemistry. The gender implications of the alternative history and interpretation he offers are considered in light of his peculiar alignment of minerals with young girls, in particular in his 1866 text *The Ethics of the Dust*. Written as a stage play in which an elderly male lecturer delivers a series of lessons on the virtues of minerals to a group of schoolgirls, this text produces strange slippages between girls and crystals which relate to Ruskin's eroticised sensory mineralogy and his own fluid subjectivity. However, this chapter seeks to investigate the gendering of non-animal objects beyond anthropomorphism and psychoanalytic and biographical readings. Considering the literal jewels of the Natural History Museum, it addresses the semiotics of stones used in jewellery in relation to ideals of feminine virtue and the potential transgressions of these performative objects in light of Gilles Deleuze and Félix Guattari's theory of becoming.

Chapter 3 proceeds to the animal with an investigation of the Museum's extensive collection of glass models of marine invertebrates by Leopold and Rudolf Blaschka, as displayed in the Coral Gallery. Given that many of the animals modelled were hermaphroditic or asexual, the chapter asks how species' sexuality affects representation in the museum. However, it also challenges the

very notion of 'representation' as imposing a subject-object dualism and as eliding the specificities of the model making process. I position the Blaschka models as queer objects, anatomically and materially hybrid. Employing the colonial anatomy of the siphonophore as a theoretical model, the chapter argues for the breakdown of representational dualism and related dichotomies, analysing the acts of model making and glassmaking and their relationship to related late nineteenth-century modes of materiality and visuality. These include the arenas of the department store and jewellery making, both of which possess feminised implications for the manufacture and display of the Blaschka models. Moving on from Ruskin's mineralogy harking back to early modern natural history, the chapter considers how the Blaschkas' practice straddled popular seaside collecting of the mid-Victorian era and the new evolutionary biology of the deep sea. This transition is seen directly in the comparison of Leopold Blaschka's early sea anemone models, taken from drawings by the natural theologian and popular natural history writer Philip Henry Gosse, with later more complex models, some microscopic, copied from Ernst Haeckel among other evolutionary biologists, and from the animals themselves. However, this chapter challenges a straightforward narrative of scientific progress and increased objectivity. The inextricable relationship of evolutionary science of the deep sea with contemporary art and literature defies this reading. Furthermore, the centrality of the animals in question to developing theories of evolution suggest radical social implications that transcend their lowly position in an evolutionary hierarchy that held Western man at its apex. The materiality of glass challenges theories of vision as passive or objective experience. Like the anatomy of the siphonophore, the glass model, fragmented both physically and in its heterogeneous applications, suggests no less than a radical breakdown of the subject.

Like the previous chapter, chapter 4 focuses on questions of normative sexuality manifest in the interface of evolutionary theory and feminised material culture in relation to displays in the Natural History Museum. Here, however, the objects in question are John Gould's sixty-two cases full of glittering hummingbirds purchased by the British Museum upon the ornithologist's death. Unlike the exhibition of minerals or marine invertebrates, bird taxidermy provided a ready forum for anthropomorphic depictions of nature: the displays of British nesting birds were a case in point with their highly admired naturalistic recreations of habitats conveying narratives that affirmed Victorian family values.

These ‘bird groups’ exemplify the paradox of taxidermy as purportedly both slave to nature and ‘art’ in itself: this mimetic duality enabled them to be viewed as proffering at once unfettered truth and artful mastery, both of which were deemed morally uplifting. Gould’s hummingbirds on the other hand presented an altogether different model of display: the gilded polygonal cases filled with various species evaded straightforward gender narratives. They recalled an earlier, more domestic model of taxidermy display, and yet Gould was renowned for his work on the birds, with Darwin among many others deferring to his knowledge on the subject.[80] Thus, like the Blaschka models, in their aesthetics and their history – originally shown as part of the Great Exhibition – Gould’s hummingbirds spanned natural history paradigms. Once again the borderlines of religious and evolutionary theories are examined in relation to how they manifest in displays in the Museum and relevant visual culture. Like marine invertebrates, hummingbirds were integral to evolutionary theory of the later century, in this case to Darwin’s theory of sexual selection, which was controversial even among evolutionists due to Victorian gender stereotypes and moral implications: sexual selection instils agency onto the females of species and, it was thought, reduces beauty to animal sensuality.[81] And yet the colourful plumage of the male birds formed adornments in women’s fashion and jewellery in the later decades of the nineteenth century. Ultimately, this ‘transgender problem’ is brought to its logical conclusion through a comparison of the birds with the figures of questionable masculinity presented by the dandy and the male Aesthete, in order to assess moral inferences of hummingbirds’ unique character among birds.

Chapter 5 moves along chronologically to examine a paradigmatic shift by the end of the century in the displays of the Insect Gallery and its relationship to dramatic transformation taking place in society. Taking the insect cabinet as the ultimate symbol of the mid-Victorian collecting impulse, with its firm taxonomic and highly visible order, this chapter considers how this order was exploded by new displays of metamorphosis and mimicry among other insect life processes. While the beetle and butterfly drawers of Alfred Russel Wallace resemble jewel boxes with their neatly laid out shining specimens, research throughout the second half of the nineteenth century by Wallace and others focussed on insects’

[80] Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (1871) (London: Penguin, 2004), *passim*.
[81] Jonathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006), 32.

invasive, deceptive and disturbing properties, reflected in the Insect Gallery's displays on disease and devastation. Insect otherness – notable for its combination of alien physiology and prolific familiarity – and in particular the process of metamorphosis become overarching metaphors for perceived threats to the British Empire by the turn of the century. This analogy is borne out in metamorphic *fin-de-siècle* literature, specifically Richard Marsh's 1897 novel *The Beetle*, whose transgender, trans-species titular villain perpetrates an attack on British civilisation and femininity. It is also echoed in the history of insect jewellery, which begins mid-century with discrete beetle jewels and reaches its climax in the full beetle wing dress worn in 1888-89 by Ellen Terry as Lady Macbeth. I argue that such insect fashion corresponds to the *femme fatale* figure suggested by the threat of the New Woman. While women's fashion was increasingly infested, humanity's deteriorating boundaries became a primary source for the hybrid insect-women of Art Nouveau. Like the Blaschka models, specimens in the Insect Gallery and their cultural resonances suggest the breakdown of the human subject due to its porosity or fragmentation, here not only in light of the human-animal hybrids imagined in the wake of Darwin and Wallace's theory of natural selection, but also the significance of insect intelligence to supernatural belief systems and the emerging field of psychology.

In the conclusion I consider the ways in which these issues of gender and nature on display continue to resonate in contemporary culture and how several artists address these legacies. I examine the implications for the future of natural history museums and their analysis.

Repolishing the Archive

The majority of the objects featured in this study still exist to be examined 'in the flesh': in addition to the rich architecture of the Museum itself and the few aspects of the original displays that remain, including the Mineral Gallery and a few cases on bird anatomy (in fact originally part of the Index Museum), I have been able to view Ruskin's minerals, the Blaschka models and insect displays in the stores in South Kensington, as well as what remains of Gould's hummingbird collection in the Natural History Museum in Tring. However, the contexts of display which form the focus of this thesis have all required major reconstruction. For each

chapter I have effected this through a combination of textual and visual research. In spite of this study's focus on glowing, colourful objects, these have been brought to life through pouring over dusty texts and black and white images in the colourless, utilitarian atmosphere of institutional archives. Even so, this task has proven challenging, as the galleries of the Natural History Museum were historically poorly documented. Three large photo albums document the collections from the time of the Museum's opening, with its massive central hall or 'Index Museum' eerily empty, through the first few decades of the twentieth century. However, with the exception of some official photographs, engravings and postcards featuring the Museum, the vast majority of the images contained were taken over time by museum visitors (most, presumably, professional photographers), who in exchange for access to the collections, donated prints.[82] On one hand, this unusual process of documentation is useful as it provides an imagistic document of which aspects of the original collections were most interesting to the Museum's audience: many of the bird groups, as well as the hummingbirds, for example, appear again and again throughout the albums. However, what becomes evident is that where possible the majority of photographers evaded the actual displays, focussing instead on the objects contained within – this is also true of the few illustrations in the Museum's guidebooks. Therefore, for example, while meteorite specimens are well documented, there are no images of the small gallery titled the Pavilion where they were displayed. This tendency points toward a traditional elision of the Museum's exhibitionary structures – both physical and ideological, I would argue – which most writers on the collections have sustained.

To complement the limited visual documentation, I have drawn on textual accounts of the galleries in the Museum's guidebooks, newspaper reviews and various contemporary and historical accounts of the collections. However, once again, such accounts are selective and all too frequently take museum objects to be the 'thing itself', as I consider in more detail in relation to the Blaschka models in the Natural History Museum, of which only one archival image and few textual acknowledgements exist. These elisions themselves can provide valuable insight into the role of objects in the Museum, regarding hierarchies imposed on both the natural world and the object world, when certain animals were deemed low in the

[82] Kate Tyte, assistant archivist and records manager, Natural History Museum, personal email (17 July 2015).

scales of both creation and evolution, and models were regarded as secondary representations – copies of nature's originals. Such historical and enduring exclusions indicate a lacuna in analysis of the Natural History Museum, and museums generally. As such I have approached these reconstructions as opportunities for critical enquiry rather than merely empirical revision.

Furthermore, my reconstructions have required the mining of several other archives in order to address these heterogeneous sets of objects. A visit with curator of mineralogy Peter Tandy, during which he showed me the Rose fluor specimens donated by Ruskin and enlightened me on the properties of silica was complemented by studying correspondence between Ruskin and Museum staff, as well as with his former girl pupils, held in the Hull History Centre. While I was able to get closest to the Blaschka models in the labyrinthine basement of the Natural History Museum, where collections manager of aquatic invertebrates and resident Blaschka expert Miranda Lowe showed me the models in their custom-made foam containers, a road trip through New York State to the Corning Glass Museum which holds the Blaschka Archive in its Rakow Research Library enabled me to view first hand the Blaschkas' lesser known preliminary drawings and sketchbooks; I went on to see the formidable collection of marine invertebrate models at Cornell University in Ithaca, and on another trip an exhibition (which really comprised a single case – the models are so small) at McGill University's Redpath Museum in Montreal. At the Musée Fin-de-siècle, Brussels, I was able to view a different but relevant set of glass marine invertebrates in Émile Gallé's Art Nouveau vases. In addition to meeting with curator of ornithology Joanne Cooper at the Natural History Museum, Tring, to view Gould's few remaining hummingbird cases, extensive collection of hummingbird skins and sumptuously illustrated *Monograph on the Trochilidae*, and a visit to the Booth Museum in Brighton, my chapter on the 'feathered gems' required research in the jewellery departments of the V&A and the British Museum. Similarly interdisciplinary research went into the insects chapter, including meetings with both curator of Coleoptera Malcolm Kerley and curator of Lepidoptera Geoff Martin at the Natural History Museum as well as visits to view the Anderson Collection of Art Nouveau at the Sainsbury Centre of Visual Arts, Norwich, and the René Lalique Gallery at the Calouste Gulbenkian Museum, Lisbon, where I was able to consult with retired curator Maria Fernanda Passos Leite. In addition I travelled to Smallhythe Place, Ellen Terry's sixteenth-century country house in Kent, to

consult her personal notebooks and scripts, with the help of house steward Susannah Mayor, and most importantly to view Terry's famous 'beetle dress'.

Accompanying this diverse array of resources is a variegated research methodology, corresponding to the different 'needs' of the objects and the discourses surrounding them.[83] For example, the established narrative of the Museum's architecture in relation to scientific ideologies calls for a critique in the first chapter while the insistent materiality of the glass models demands analysis. In addition, questions of sexuality pertaining to marine invertebrates require in-depth analysis of evolutionary theory, as do hummingbirds and their significance for sexual selection. Chapters on Ruskin's minerals and displays in the Insect Gallery alternatively employ extensive literary critiques due to the striking pertinence of the fictional works in question. The Blaschka chapter on the other hand employs a more minor literary work, a single emphatic newspaper review, as an entry point into popular reactions to the Coral Gallery and the objects contained within. While external art and design play secondary or very minor roles in the first three chapters, jewellery – whether hummingbird, beetle or Art Nouveau – forms a major point of analysis in the final two. In every chapter the contexts of display in the galleries of the Natural History Museum are foregrounded. However, rather than an inward looking institutional critique, this thesis examines the stories that are triggered by objects on display and considers how these stories may elucidate those objects.

Men and Women

One commonality that may stand out is that each set of objects, and accordingly each chapter revolves around one or more distinctive male figures. Whether avowedly religious or evolutionist, each of these men possessed beliefs – or produced objects – that have been viewed as unorthodox or even eccentric. Most have been villainised at one time or another. Although one of the leading anatomists and scientific thinkers of the nineteenth century, Richard Owen has

[83] See W.J.T. Mitchell, 'What Do Pictures Want?' in Terry Smith, ed., *In Visible Touch: Modernism and Masculinity* (Chicago: University of Chicago Press, 1997), 215-32. Also see Bill Brown, 'Thing Theory', *Critical Inquiry* 28.1 (autumn 2001), 1-22; Fiona Candlin and Raiford Guins, eds, *The Object Reader* (London: Routledge, 2009); and Antony Hudek, ed., *The Object* (London and Cambridge: Whitechapel Gallery and MIT Press, 2014).

become historically renowned chiefly as the founder of the Natural History Museum, while his scientific profile has been reduced to a representative of the religious old guard of natural history, 'Charles Darwin's creationist whipping boy'.[84] And yet Owen was not a creationist but in fact believed in a non-Darwinian form of evolution; it was likely his clash with the Darwinists that resulted in the tarnishing of his legacy, in a classic case of the victors writing history.[85] Nevertheless, the palaeontologist who once hosted a dinner party in the belly of an iguanodon was notoriously odd, a 'queer fish' whose idiosyncratic ideas are most magnificently embodied in the Natural History Museum.[86]

As with Owen, John Ruskin's character has been subject to debate ever since he was alive: English scholar Francis O'Gorman argues that despite his self-styled effeminacy, Ruskin's contemporary biographers' attempts to masculinise him have led to his rejection by feminists as a symbol of Victorian patriarchy.[87] Such characterisations are relevant not only to the connotations of his conflation of minerals and girls that form the focus of chapter 2, but also for the larger question of how gender suffuses his singular vision of natural history, which as with Owen was not strictly natural theological.[88] Ruskin's beliefs also arise in chapter 4 in regards to his debates with Darwin over the origins of beauty in birds' plumage: as with modern mineralogy, Ruskin rejected the materialism he inferred from sexual selection's carnal focus.[89] His distaste for sex in nature complements theories of his own asexuality.[90] Ruskin's peculiar beliefs translated to his art criticism: he similarly rejected the sensuous amorality of the 'art for art's sake' ethos.[91] Against popular belief, Ruskin was neither natural theologian nor Aesthete.

John Gould was cagier about his beliefs – and it has been suggested that his disassociation with Darwin's ideas might have sprung from a desire to

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[84] Nicolaas Rupke, *Richard Owen: Biology Without Darwin*, rev. edn (Chicago: University of Chicago Press, 2009), xi.
[85] Rupke, 3.
[86] T.H. Huxley quoted in Stearn, 29. In 1853 Owen held a New Year's Eve dinner in the near-complete carcass of one of the prehistoric animal models he worked on with sculptor Benjamin Waterhouse Hawkins for Crystal Palace Park. Rupke, 78.
[87] Francis O'Gorman, 'Manliness and the History of Ruskin in Love: Writing Ruskin's Masculinity from W.G. Collingwood to Kate Millett', in Dinah Birch and O'Gorman, eds, *Ruskin and Gender* (New York: Palgrave, 2002), 11.
[88] Sharon Aronofsky Weltman, *Performing the Victorian: John Ruskin and Identity in Theater, Science, and Education* (Columbus: Ohio State University Press, 2007), 59.
[89] Smith, 32.
[90] Weltman, 113.
[91] Smith, 26.

maintain favour with a wealthy conservative elite of subscribers, much like Owen may have feigned his 'creationism' to establish allegiance with Oxbridge's official stance of natural theology.[92] However, Gould's professed belief in hummingbird colouring's 'mere purpose of ornament' combined with his ornithological exactitude manifested in his uniquely ornamental yet scientific bird cases.[93] This thesis examines how these cases, in light of Gould's perceived character as a bird connoisseur alternating between showman and miser, signify a broader cultural perception about beauty and science in relation to gender.

Similarly, while little is known about Leopold and Rudolf Blaschka's beliefs beyond their sources, which transitioned from natural theologian to evolutionist over the later decades of the nineteenth century, the glass models they produced assume an awkward stance in between scientific paradigms and with their own aesthetic eccentricities. However, another key figure in chapter 3 is Ernst Haeckel. Regardless of his renown for popularising Darwinian evolution, and the lasting popularity of his intricate and symmetrical drawings of marine invertebrates, Haeckel was controversial due to the influence of German *Naturphilosophie* on his thought and his resulting belief in Monism: regardless of his atheism the spiritual overtones of his writing and notably his drawings drew criticism.[94] His idealistic 'ideas in images', with their overtones of wondrousness harking back to an earlier paradigm, thus may have tainted perceptions of the Blaschka models, likening both to a 'scientific version of the cult of beauty'.[95]

Like Haeckel, in spite of his adherence to evolutionism, as co-publisher with Darwin of the theory of evolution by means of natural selection, Alfred Russel Wallace faced criticism for mystical influences on his thought by way of his involvement with mesmerism and spiritualism. Eventually diverging from Darwin on the topic of sexual selection, Wallace was also ostensibly at odds with

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[92] Smith, 94, and Voss, 160; Rupke, 68.
[93] John Gould, *An Introduction to the Trochilidae, or Family of Humming-Birds* (London: Taylor and Francis, 1861), 18.
[94] See Robert J. Richards, *The Tragic Sense of Life: Ernst Haeckel and the Struggle Over Evolutionary Thought* (Chicago: University of Chicago Press, 2008), 5-9; Olaf Breidbach, *Visions of Nature: The Art and Science of Ernst Haeckel* (Munich: Prestel, 2006), 71, 233, 197; and Hopwood, *passim*. Stephen Jay Gould has argued that Haeckel's mystical approach to evolutionary biology contributed to the Nazi agenda of racial purification. However, biographers have dismissed such claims as tenuous and resulting from misunderstanding, even though the Nazis applied Haeckel's ideas about eugenics. Stephen Jay Gould, *Ontogeny and Phylogeny* (Cambridge, MA: Harvard University Press, 1977), 78; Richards, 5-6; Mario A. Di Gregorio, *From Here to Eternity: Ernst Haeckel and Scientific Faith* (Gottingen: Vandenhoeck & Ruprecht, 2005), 569-71.
[95] Daston and Galison, 247; di Gregorio, 569.

mainstream evolutionary thought in his 'inability to view human evolution in entirely materialistic terms'.[96] But as demonstrated by his and Darwin's shared passion for collecting insects, or 'beetlemania',[97] even within accepted scientific practice objects gave rise to intangible emotion and ethereal ideas, such as the process of metamorphosis shared by both insects and figures of fantasy. As numerous scholars have argued in recent decades, on examination even Darwin's thought falls short of the antireligious empiricism it has become synonymous with as foil to modern-day creationism, with the influence of romanticism also present in his 'inverted sublime' theory which brings metamorphosis 'out of fairy-tale and into actuality'.[98]

Thus, the collection of unorthodox thinkers in this study, whether evolutionist or adamantly anti-evolutionist, appear less due to my deliberate selection of naturalist eccentrics than to the fact that the unified rational evolutionary front that has come to signify the overcoming of religious superstition by secular science is a myth. While Darwin and the vicissitudes of his thought form important aspects for several analyses, for example pertaining to questions of sexuality in relation to marine invertebrates and hummingbirds, I have avoided an overly 'Darwinocentric'[99] narrative in order to more accurately illustrate the variety of religious-scientific belief in the second half of the nineteenth century and its ramifications for gender. Why then, this thesis does not prioritise the histories of female naturalists, is on one hand explained by the impetus to deconstruct the internal mechanisms of the dominant narrative from within: just as feminist art historians such as Griselda Pollock have rejected the possibility of a straightforward reinsertion of female artists into the extant artistic canon as neglecting the larger structures of systemic sexism upon which the canon is founded, not to mention the gender essentialism inherent in the assumption that female artists would somehow redress the balance, this study is less concerned with the individual agents than with the forums within and the objects upon which

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[96] Charles H. Smith, 'Alfred Russel Wallace on Spiritualism, Man and Evolution: An Analytical Essay', self-published pamphlet (Torrington, CT, 1992), 4.
[97] Cannon Schmitt,'Victorian Beetlemania', in Deborah Denenholz Morse and Martin Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 40.
[98] Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (1983), 2nd edn (Cambridge: Cambridge University Press, 2000), 106, 128. Also see Horst Bredekamp, *Darwins Korallen: Frühe Evolutionsmodelle und die Tradition der Naturgeschichte* (Berlin: Wagenbach Verlag, 2005), 67-70.
[99] This is the term used by *The Alfred Russel Wallace Website*, 'Introduction', *The Alfred Russel Wallace Website* <http://wallacefund.info/> accessed 27 May 2015.

they acted.[100] Through the analysis of objects on display and connected visual and material culture and surrounding discourses, my aim is to transcend focus on men *or* women, in favour of analysing gender as a multidimensional phenomenon resonating within objects and culture.

Things and Other Hybrids

The experiences of specific audiences are also therefore not examined at length here. From the performative inscription of progress onto the museum's public outlined in Bennett's critique to the sensory experience beyond the Victorian period's 'scopic regime', and its infinite variations depending on the visitor, the 'museum affect' on the body moving through spaces and encountering objects has been emphasised and more work in this area is called for.[101] However, both the grander societal structures imposed on the museum visitor, as well as the subtler differences of his or her individual encounter are beyond the scope of this thesis and its emphasis on objects. Instead, much like the masculinist discourses surrounding nineteenth-century museum practice, the analyses contained here also take the dominant sensory experience of visuality as their starting point, explicitly considering the Museum's displays in formal terms. Art historian Barbara Maria Stafford has critiqued cultural studies and postcolonial theory for an iconoclasm that 'reduces visuality to an evil', a tendency exemplified by Preziosi's vitriolic condemnation of the Crystal Palace and its scopophilic order.[102] While analyses such as Preziosi's articulate the problematic drive of modern display practices to fetishise difference, they risk generalising all acts of making visible as stemming

[100] Griselda Pollock, 'Feminist Interventions in the History of Art: An Introduction', in *Vision and Difference: Feminism, Femininity and the Histories of Art* (1988), new edn (London: Routledge, 2003), 1-24. On the role of nineteenth-century women naturalists, see Shteir and Lightman, and Janet Browne, 'Do Collections Make the Collector? Charles Darwin in Context', in Beretta, ed., 171-78; and Kohlstedt, 'Nature by Design', 110-39.
[101] Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*, new edn (Cambridge, MA: MIT Press, 1992), 20; Samuel Alberti, 'Museum Affect', 373. Also see Fiona Candlin, *Art, Museums and Touch* (Manchester: Manchester University Press, 2010); Sandra H. Dudley, ed., *Museum Materialities: Objects, Engagements, Interpretations* (London: Routledge, 2010); and Dorinda Outram, 'New Spaces in Natural History', in Nicholas Jardine, James Secord and Emma Spary, eds, *Cultures of Natural History* (Cambridge: Cambridge University Press, 1996), 249-65.
[102] Barbara Stafford, *Good Looking: Essays on the Virtues of Images* (Cambridge, MA: MIT Press, 1996), 7.

from the 'phallomorphic imaginary' even though, as Carla Yanni writes, 'not all acts of looking are equal'.[103]

In contrast, the small and shiny objects on display are considered here for the unique acts of looking they warranted. Instead of their 'inherent superficiality', I aim to mine their archives to probe the depths behind their surfaces, as they are insistently three-dimensional – I am more interested in 'thoughts in things' than 'ideas in images'.[104] This involves an engagement with related objects such as ornaments and jewellery, in museums and as worn by women, and thus implicates discourses beyond museology and the history of science, such as design and dress history. Due to their human and non-human construction and their interdisciplinary resonances, I argue that such hybrid objects become chimeras, as formulated by Donna Haraway and Lorraine Daston.[105] Such hybrids or chimeras are examined in relation to their networks – with natural history museums forming a prime example of historical zones of nature-culture – or to use Deleuze and Guattari's term, assemblages, and their inextricable symbiotic relationships of becoming.[106] With her theory of agential realism, Karen Barad has argued forcefully that objects do not pre-exist their relationships within discourse as discrete phenomena, but rather are mutually constituted in 'intra-action'.[107] She mobilises these concepts to defy social constructivism's dualistic logic, in which matter is positioned as subservient to language.

A focus on objects' hybrid materiality in relation to the networks surrounding the Museum thus necessitates a move away from the Foucauldian and social constructivist critiques that have characterised much museology, in favour of new materialist and posthumanist theory that re-examines the theoretical potential of the material and transcends binaries based in humanism. Elizabeth Grosz, for example, has argued that biological discourses should not be dismissed

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[103] Preziosi, 98; Yanni, 9.
[104] Stafford, 7; Sally Gregory Kohlstedt, '"Thoughts in Things": Modernity, History, and North American Museums', *Isis* 96.4 (2005), 586-601.
[105] Donna Haraway, 'A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies', *Configurations* 2.1 (1994), 60; Lorraine Daston, ed., *Things That Talk: Object Lessons from Art and Science* (New York: Zone Books, 2004), 21.
[106] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (1980), trans. Brian Massumi (London: Continuum, 2004), 25. On hybrid networks, see Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993), 7.
[107] Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007), 203.

as inherently 'dangerous', but are in fact ripe for feminist analysis.[108] Grosz specifically calls for a feminist reinvestigation into Darwinian theory, suggesting that, not unlike feminist re-readings of Freud, this could open the doors to new conceptions of agency and identity:[109] her analyses of natural selection and sexual selection are incorporated in chapters on marine invertebrate models and hummingbird taxidermy, respectively. Similarly, Rosi Braidotti's nomadic theory relates sexual difference to human-animal becomings, or metamorphoses, which are explored in the final chapter on the transformation of the Insect Gallery.[110]

Thus the aesthetics that are formulated in this thesis extend to the animal with questions concerning, for example, hummingbird 'taste', and relate to gender such as in the correspondence between the insect and the *femme fatale*. The focus on the non-human, and importantly the non-animal, aims to transcend anthropocentric hierarchies that were inscribed in nineteenth-century stratifications: while the evolutionary 'tree of life' in which 'man' is placed at the top forms the clearest visual example – as examined in chapters on the Index Museum and 'lowly' invertebrates – natural theology similarly ranked life forms.[111] Furthermore, these strata were echoed in popular natural history collecting practices' order for class and gender, which connected smaller, domestic specimens of flora and fauna, whether ferns, shells or insects, with women and the working and middle classes and large game hunted abroad with upper-class men.[112] Correspondingly, amateurism was eventually denigrated within newly professionalised scientific fields, with T.H. Huxley disparaging the term 'naturalist' as including a 'lower order of men'.[113] Similar forms of hierarchy, however, are sustained in recent studies that prioritise the human, or

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[108] Elizabeth Grosz, *Time Travels: Feminism, Nature, Power* (Durham, NC: Duke University Press, 2005), 28. For a useful survey of the debates over biophobia in recent feminist theory, see Noela Davis, 'New Materialism and Feminism's Anti-Biologism: A Response to Sara Ahmed', *European Journal of Women's Studies* 16 (Feb. 2009), 67-80.
[109] Grosz, 28.
[110] Rosi Braidotti, *Metamorphoses: Towards a Materialist Theory of Becoming* (Cambridge: Polity Press, 2002), 149.
[111] William Kirby and William Spence, *Introduction to Entomology: Or Elements of the Natural History of Insects*, 7th edn (London: Longman et al., 1856), 2.
[112] Charles Kingsley idealised the young woman 'in a boudoir full of shells and fossils, flowers and sea-weeds' but puzzled at the London merchant as moth collector. He drew a marked distinction between the naturalist and the sportsman. Kingsley, *Glaucus; Or, the Wonders of the Shore*. 3rd edn (Cambridge: MacMillan and Co., 1856), 47, 4, 14. Keeper of zoology Albert Günther wrote of the British animals gallery to which 'the large number of visitors resort who seek recreation from their daily toil in collecting specimens of Natural History of some kind, and to whom this occupation is as fascinating as sport to the higher classes of the community'. Günther, *History of the Collections*, 61.
[113] Quoted in John F.M. Clark, *Bugs and the Victorians* (New Haven: Yale University Press, 2009), 96.

even the anthropomorphic. Within the logic of Victorian moralism, even crystals, sponges and insects were anthropomorphised, the latter said to provide 'many useful lessons in Ethics',[114] as nature – including in the Natural History Museum – was embraced as an antidote for the perceived degeneration of modern urban culture.

And yet, this anthropocentrism risks being repeated even in recent accounts of queer animality which employ animals as human stand-ins.[115] As with feminism, the insertion of queerness into the extant confines of history – whether of art or of nature – risks reinforcing those very confines.[116] Myra J. Hird suggests that rather than 'read nonhuman living organisms through the lens of queer', we 'read queer through a nonhuman lens'.[117] However, instead of the naturalisation of queer Hird recommends, I seek to mobilise queerness as not necessarily rooted in the biological: here femininity and masculinity are treated as abstract concepts that can be infinitely embodied, and thus queer is not limited to sexual orientation, whether human or animal. Thus this study posits conceptions of queer that are formulated beyond anthropomorphism or even animality, in keeping with Haraway's employment of the chimera as a process of queering nature to escape the logic of dominance.[118]

Conclusion

Such ideas are readily embraced within studies of contemporary art, in which artists themselves are privy to the theorisation, however their ramifications for historical art and display are equally important. They form integral aspects to my reconstructions of the Natural History Museum's galleries containing jewel-like objects and the surrounding assemblages. In light of the lack of gender analysis of natural history museums, these current examinations in gender and animal studies

[114] Kirby and Spence , 9.
[115] Conversely, Lorraine Daston and others have argued for the usefulness of anthropomorphism for transcending self and species. Daston and Greg Mittman, eds, *Thinking with Animals: New Perspectives on Anthropomorphism* (New York: Columbia, 2006). Similarly, Roger Caillois questioned if it is so unlikely that animals might share human characteristics. Cited in Hillel Schwartz, *The Culture of the Copy: Striking Likenesses, Unreasonable Facsimiles* (New York: Zone Books, 1996), 175.
[116] See Robert Mills, 'Queer is Here? Lesbian, Gay, Bisexual and Transgender Histories in Public Culture', in Levin, ed., 80-88.
[117] Myra J. Hird, 'Animal Trans', in Noreen Giffney and Hird, eds, *Queering the Non/Human* (Aldershot, UK: Ashgate, 2008), 227-48.
[118] Haraway, 'A Game of Cat's Cradle', 60.

need to be mobilised. However, this study avoids anachronistic readings of historical discourse by primarily examining nineteenth-century perspectives on animal and non-animal nature, in order to historicise such understandings and discern their implications. The primary purpose of this thesis is to shed light on a set of collections on display that have historically been obscured and naturalised, in order to demonstrate the gendered aesthetics that underlay their circumstances in the Museum.

CHAPTER ONE

Monad to Man: Shifting Natural Histories in the Index Museum

The statue of Charles Darwin that in 2015 resides on the landing of the great staircase overlooking the central hall of the Natural History Museum was unveiled in this original position in June 1885 (figs 1.1, 1.2). At this time, as today, Darwin's white marble personage with its cool gaze perched atop his stone throne appeared as a triumphant rebuff against natural theology – the belief in nature as a manifestation of the divine that had dominated nineteenth-century British scientific thought.[1] However, Darwin's position within the famously religious-inflected architecture of the 'cathedral to nature' was far from stable or definitive.[2] When, in March 1897, the bronze statue of Richard Owen, eminent biologist, staunch anti-evolutionist and founder of the Natural History Museum was unveiled across the central hall from Darwin's statue, it enacted a faceoff between the two giants of nineteenth-century natural history and their respective orders (figs 1.3, 1.4).[3] However, instead of this well-known dialectic, I wish to consider the space, both physical and metaphorical, in between these two formidable figures and how it complicates a straightforward reading of natural theology versus evolution, as ostensibly manifest in the Museum. The central hall was purpose-built to house the Index Museum, intended to function as an encyclopaedic object-based guide to the collections. Although the Index Museum, like all of the architecture, was the concept of Richard Owen, when he retired within only a few years of the Museum's opening, responsibility for the space fell upon the new director, William Henry Flower, an evolutionist. As the nucleus of

[1] Such widespread belief largely corresponded to William Paley's teleological argument presented in *Natural Theology* (1802), ed. Matthew D. Eddy and David Knight (Oxford: Oxford University Press, 2006).

[2] The Natural History Museum's website still uses this moniker. 'Terracotta Tour: Cathedral of Nature', *Natural History Museum website* <http://nhm.ac.uk/visit-us/history-architecture/architectural-tour/cathedral-of-nature/index.html> accessed 20 June 2015.

[3] In 1927 Owen's statue assumed Darwin's place, while the Darwin statue was moved to the north hall. The latter was returned to its original position on the central hall stairs in 2008 to celebrate the bicentenary of Darwin's birth in 2009. Nicolaas Rupke attaches symbolism to the choice of materials for Darwin and Owen's statues, claiming that Owen's blackened bronze was 'made to serve the purpose of black countershading, to enhance the shiny white of Darwin and the Darwinians'. This subjugation is ironic, 'given that the founding of the Natural History Museum was Owen's work, accomplished in the face of Darwinian opposition'. Nicolaas Rupke, *Richard Owen: Biology Without Darwin*, rev. edn (Chicago: University of Chicago Press, 2009), 3.

the Museum, this space offers a focal point from which to examine the architecture of the Natural History Museum as a framework for its material culture.

Like the entire institution, the Index Museum marks a heterogeneous space, evidenced by the complexities of its display practices, which, in spite of harbouring an increasing concern for scientific specificity, also demonstrate a mounting concern for aesthetics and public appeal. This paradox points toward inconsistencies for certain assumptions about the history of science, in particular that science's modernisation is characterised by masculinist exclusivity.[4] This notion is contradicted not only in the Natural History Museum's ornate architecture under Owen, which was aligned with design movements that celebrated traditional women's work, but also in the displays under Flower, which bore resemblance to those in nearby department stores, a connection female visitors could not have failed to make. The teleological vision of the museum's trajectory as directly echoing scientific progress was a myth that still requires examination.[5] The constituent dichotomies, of religion and evolution, education and entertainment, science and art break down in an analysis of the Museum's displays under the two ostensibly opposing regimes of nineteenth-century scientific thought. Despite the evidently male-dominated space, overlooked symbolically by statues of Darwin and Owen and physically by an all-male senior staff,[6] the gender dynamics implicit in the objects and displays of the Index Museum and its surrounding architecture are more complex than they appear.

The Genesis of the Natural History Museum

The architecture of the Natural History Museum is as notorious for its idiosyncrasy as it is for its anachronism; however, the familiar narrative that positions Richard Owen as the mastermind behind an ultimately unsuitable and

[4] On science as a masculine construct, see, for example, Evelyn Fox Keller, *Reflections on Gender and Science* (New Haven: Yale University Press, 1985), 79; Lynda Birke, *Feminism, Animals and Science: The Naming of the Shrew* (Buckingham, PA: Open University Press, 1994), 6; and Nancy Tuana, 'The Weaker Seed: The Sexist Bias of Reproductive Theory', in Tuana, ed., *Feminism and Science* (Bloomington, IN: Indiana University Press, 1989), 169.
[5] Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995), 2.
[6] The Natural History Museum first employed women as permanent staff in the 1920s. Susan Snell and Polly Tucker, *Life Through a Lens: Photographs from the Natural History Museum 1880-1950* (London: Natural History Museum, 2003), 7.

obsolete building requires revisiting.[7] The allegedly immediate obsolescence was at least partially the result of a long and drawn-out planning and building programme. Appointed superintendent of the natural history departments of the British Museum in 1856, former professor and conservator at the Royal College of Surgeons Owen began his campaign for larger and better galleries for the collection as early as 1858, twenty-three years before the new museum would finally open in South Kensington.[8] While Owen has been portrayed in various lights, it is clear that he was a master myth-maker, who excelled in propagating rhetoric to suit his purposes, and he utilised this skill to achieve his goal of founding a national museum of natural history. In a published treatise, he condemned the British Museum's 'sometimes dangerously' overcrowded natural history galleries and complained of the displays:

> In this space, as is notorious, the specimens are packed as closely as they can be stored, often three, four, or five deep in the cases; or they crowd the floor like a herd of cattle; or they are attached to the wall, at heights inaccessible to the scientific observer.[9]

Owen was well connected: he taught natural history to the royal children at Buckingham Palace at the request of Prince Albert, who was already beginning to form plans for the future Albertopolis, South Kensington's great museums centre that developed out of the Great Exhibition of 1851.[10] Also a close acquaintance of Lord William Gladstone, in 1861 Owen strategically invited the then chancellor and elected trustee of the British Museum for a personal tour of the natural history facilities in their full 'state of cram'.[11] Thus it was no coincidence that work finally began on Cromwell Road in 1873, during Gladstone's first term as Prime Minister.[12] Owen's biographer Nicolaas Rupke writes: 'The founding of the Natural History Museum was the result of Owen's vision combined with Gladstone's political pertinacity. It was not merely an architectural expression of the popularity of natural history'.[13]

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[7] See William T. Stearn, *The Natural History Museum at South Kensington: A History of the British Museum (Natural History) 1753-1980* (London: Heinemann, 1981), 56-63.
[8] Owen, 'Presidential Address to the British Association for the Advancement of Science in Leeds' (1858), *Report British Association* (1859), xcv, cited in Stearn, 35.
[9] Owen, *On the Extent and Aims of a National Museum of Natural History* (London: Saunders, Otley and Co., 1862), 105, 13.
[10] Stearn, 42.
[11] Owen, 'Report to the Commission of the Advancement of Science' (1874), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[12] Mark Girouard, *Alfred Waterhouse and the Natural History Museum* (London: Natural History Museum, 1999), 7.
[13] Rupke, 43.

More than Owen's 'vision', however, the particular form the Natural History Museum was to take rested on a series of institutional, bureaucratic and socio-political circumstances. Plans for the expansion of the national natural history collections went through many stages of debate among the Trustees of the British Museum and in Parliament. Although it was widely agreed that the existing conditions of the collections in the British Museum were inadequate, the solution – whether to expand the existing gallery space at Bloomsbury or remove the collections to a new site – was far from clear. Owen's initial proposal to remove the collections was rejected by a Select Committee, not least due to a memorial eschewing the separation of science from the cultural background of the British Museum, signed by a party of leading scientists including Charles Darwin and T.H. Huxley in November 1858.[14] The proposed location of South Kensington was deemed remote and desolate, and Owen's plan for 45,000 square metres of exhibition space – almost ten times that available in Bloomsbury – outlandish.[15] Opponents recommended a 'typical mode of exhibition', as opposed to one that 'consisted of galleries 850 feet in length for the exhibition of whales'.[16]

But beyond objections to its excesses, Darwin and his colleagues' rejection of Owen's plan is notably rooted in a desire for natural history to remain accessible, distinctly countering the idea that professional evolutionary science dislodged public engagement.[17] While many scientists, British Museum trustees and politicians wished to keep natural history intact in Bloomsbury, this was not only due to the convenience for naturalists and students, who would continue to have ready access to the national library, but also for the working-class public to which the collections were intended to cater, and for whom – largely located in the east end – South Kensington was deemed inaccessible.[18] Although the large museum Owen envisaged on the site of the 1862 Universal Exhibition corresponded with the Prince Consort's conception of a science quarter in Kensington, the suburb's primary associations were with a burgeoning museum district – centred around the South Kensington Museum and director Henry

[14] A.E. Günther, *The Founders of Science at the British Museum 1753-1900* (Halesworth, UK: Halesworth Press, 1980), 119.
[15] Girouard, 12.
[16] Hansard, 'Debate of July 22, 1861', quoted in Owen, 'Address to the Biological Section of the British Association', York 1881, 10, Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[17] See, for example, Thomas William Heyck, *The Transformation of Intellectual Life in Victorian England* (New York: St Martin's Press, 1982).
[18] J.B. Bullen, 'Alfred Waterhouse's Romanesque "Temple of Nature": The Natural History Museum, London', *Architectural History* 49 (2006), 260.

Cole's focus on art and industry – born out of the universal exhibitions.[19] The prosperous location's proximity to Kensington Palace as well as to a fledgling upmarket shopping area which expanded to nearby Knightsbridge would have held further associations with spectacle and commerce some deemed unsuitable for a national locus of scientific activity.[20] Hence, resistance against the Museum's move was at once anti-populist and anti-bourgeoisie.

While Owen made enemies within the new class of professional evolutionary scientists, he maintained favour with the cultural elite. His supporters included Lady Elizabeth Eastlake, art critic and wife of the director of the National Gallery, Sir Charles Eastlake. Lady Eastlake expressed surprise that the division of the 'productions of nature, art, science, and literature' into separate museums would provoke opposition by the later nineteenth century, and on the subjugation of the natural history collections under the broader Museum, asked, 'Is this the way to popularize science?'. In honour of Owen's prominence in scientific thought and museum curation, she demanded, '[L]et him have a temple of his own instead of being a lodger'.[21]

In January 1862 this demand was answered when a subcommittee of the Trustees recommended the removal of the natural history collections, and in 1863 the House of Commons approved the purchase of over 30,000 square metres for the new museum in South Kensington.[22] Once Owen's plan for the building had been whittled down accordingly to 20,000 square metres by allocating additional exhibition space to a first floor, an architectural competition was mounted in 1864. When the winner of the competition, Captain Francis Fowke RE, unexpectedly died the following year, he was promptly – and somewhat mysteriously – replaced by the rising Manchester architect Alfred Waterhouse, even though Waterhouse had not entered the competition. Initially Waterhouse

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[19] For further analysis of the politics surrounding the South Kensington location, see Carla Yanni, *Nature's Museums: Victorian Science and the Architecture of Display* (New York: Princeton Architectural Press, 2005), 113. For a history of the South Kensington Museum/V&A, see Anthony Burton, *Vision and Accident: The Story of the Victoria and Albert Museum* (London: V&A, 1999).

[20] My thanks to John Holmes, senior lecturer in English literature, University of Reading, for leading me to the potential implications concerning class and gender of the Museum's new location. Personal communication (11 Nov. 2013). For more on shops in London in the later nineteenth century, see Deborah Cohen, *Household Gods: The British and Their Possessions* (New Haven: Yale University Press, 2006), 44-56; and Alison Adburgham, *Shops and Shopping 1800-1914* (1964), 3rd edn (London: Larrie and Jenkins, 1989).

[21] Elizabeth Eastlake, 'Compilation of select documents' (1835-1858), in Jonah Siegel, ed., *The Emergence of the Modern Museum: An Anthology of Nineteenth-Century Sources* (Oxford: Oxford University Press, 2008), 220-21, 224.

[22] Stearn, 42-43.

was expected to fulfil Fowke's designs, but following more parliamentary conflict and financial issues, he was required to revise the plans substantially, ultimately designing a new building.[23]

A Cathedral of Nature?

Just as the impetus behind the erection of the Natural History Museum was more complex than a reflection of natural history's increasing importance, its design was more than a manifestation of Owen's religious beliefs. In addition to some complex bureaucratic reasons, Waterhouse's appointment was likely due to his Ruskinian, neo-Medievalist sympathies, manifest in his recent design of Manchester's Assize Courts (1861-1869).[24] Although Waterhouse was to make his own mark on the architecture, the redesign was supervised by Owen every step of the way. Before any architects had been consulted, Owen expounded clear ideas of how the architecture should function and drew up plans that – although diverging greatly from the building's eventual realisation – suggested a strong idea of what form the Museum should take (fig. 1.5). He expressed a marked interest in the architecture, claiming, 'I am not one of those who ignore Architecture as one of the Fine Arts, and think it comes by Nature; or who regard its professors as obstructive to the acquisition of a useful purposive public edifice'.[25] Raised a Quaker, Waterhouse's embrace of the current Gothic revival in architecture, as a subscriber of the writings of John Ruskin, apparently suited Owen's vision – Owen praised Waterhouse's neo-Romanesque design as constituting a 'beautiful and appropriate style of architecture'.[26]

The adoption of this style for the Museum is generally attributed to Owen's religious leanings.[27] Renowned for several major palaeontological discoveries, notably his work on dinosaurs (having coined the term), Owen was hailed early on as 'the British Cuvier', not only for his prominence as a comparative anatomist, but also for his adoption of the earlier French naturalist's

[23] Girouard, 20-21.
[24] For an explanation of the circumstances surrounding Waterhouse's appointment, see Girouard, 18, and Bullen, 266.
[25] Owen, *Extent and Aims*, 77.
[26] Quoted in Girouard, 17.
[27] For example, Stearn, 57; and John Holmes, 'A Cathedral to Nature', lecture, Natural History Museum (24 June 2013), DVD recording.

functionalist method which fed into the design argument propagated at Oxford and Cambridge by Owen's seniors such as William Buckland.[28] Owen's rise to prominence with the proven hypothesis of an ancient giant non-flying bird (the New Zealand moa), reconstructed from only a fragment of a femur, echoed Buckland's own famed reconstruction of a hyena den through the discovery of fossilised faeces.[29] Both feats reflected Cuvier's insistence on the functional correlation of all parts within an organism and within nature. Although not stated explicitly in religious terms, the teleological implications of Cuvierian functionalism lent itself to the British argument from design.[30] Based on William Paley's argument for intelligent design in nature and all of its intricate mechanisms – Paley compared the design of these mechanisms to those of a watch, and God to a watchmaker – the reasoning was at the heart of the natural theology that dominated British scientific thought in the first half of the nineteenth century.[31]

These ideas appear to have deeply informed the design of the Natural History Museum. While evolutionists such as Huxley campaigned to divide the British Museum's natural history department's constituent parts into specialist groupings, Owen wished to 'preserve its unity as a symbol of the unity of creation', offering a 'comprehensive, philosophic, and connected view' of the various classes of nature.[32] The doors of the new Natural History Museum opened on Easter Monday, 18 April 1881 (figs 1.6, 1.7). The three most distinctive features of the building – its early Gothic, or more accurately Romanesque design, its extensive use of terracotta and its animal ornamentation throughout – worked in unison to create a sense of religiosity within the architecture. A newspaper reviewer titled the edifice 'a true Temple of Nature'.[33] Fowke's original design had employed an early Renaissance style, popular in the midcentury, and, for example, used in the neighbouring South Kensington Museum. However, Gothic revivalists, such as Ruskin and A.W.N. Pugin eschewed the Renaissance as having its roots in Pagan culture, rather than Christianity; they saw it as having

[28] Rupke, 66.
[29] Rupke, 70.
[30] Toby A. Appel, *The Cuvier-Geoffrey Debate: French Biology in the Decades Before Darwin* (Oxford: Oxford University Press, 1987), 41.
[31] Paley, 7-15.
[32] Bullen, 259; Owen quoted in Girouard, 12-13.
[33] *The Times*, 18 Apr. 1881. Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

replaced the vitality of the Middle Ages with a tyranny of order.[34] In contrast, Ruskin claimed that the Romanesque style of tenth- to twelfth-century Germany that Waterhouse selected for adapting Fowke's plan 'has no corruption'.[35] Meanwhile, the lingering classical forms of the Romanesque enabled Waterhouse to maintain not only the rounded arches from Fowke's plan, but also its underlying order and symmetry, which was largely lost within the High Gothic.[36] By maintaining this sense of balanced order, the architecture could effectively manifest Owen's ideas of the unity of nature as opposed to randomness or chaos.[37] Early drawings featured domed towers adorned by allegorical figures, but this more conventional, human-focussed design soon gave way to something more Gothic and more animal (figs 1.8, 1.9).

Owen defended Waterhouse's selection of the Romanesque style, in particular for its decorative potential: 'No style could better lend itself to the introduction, for legitimate ornamentation, of the endless beautiful varieties of form and surface-sculpture exemplified in the animal and vegetable kingdoms.'[38] Ruskin along with Henry Ackland had promoted architectural decoration with 'truthful' organic form, stating that 'all art employed in decoration should be informative, conveying truthful statements about natural facts'.[39] In the Natural History Museum, plant and notably animal decoration proliferated in both the exterior and interior architecture. Featuring all over the façade, ubiquitous as architectural flourishes and forming structural elements, the nature-themed sculpture forms an integral aspect of the building's design (figs 1.10-1.12). It manages to be at once naturalistic – convincingly and accurately rendered and generally life-sized – and highly stylised, with plant and animal forms contorted into repeating, symmetrical patterns. Designed by Waterhouse and modelled by the local craftsperson Dujardin, the sculptures were very much Owen's idea and based on images of his selection.[40]

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[34] Girouard, 31.
[35] Ruskin, *Works*, vol. 9, 47, quoted in Bullen, 271.
[36] For a thorough analysis of the reasons behind Waterhouse's use of the Romanesque and his influences, see Bullen, *passim*.
[37] Bullen argues that given the residual classicism of the Romanesque, its employment furthermore united the secular associations commonly expected of museum architecture with religious architectural metaphors. Bullen, 271.
[38] Owen, 'Address to the Biological Section', 10.
[39] Henry W. Ackland and John Ruskin, *The Oxford Museum* (London: Smith, Elder and Co, 1859), 51.
[40] Owen, 'Address to the Biological Section', 8. On his involvement in the designs, Owen wrote, 'I took the liberty to suggest, as I had previously done to Capt. Fowke, that many objects of natural

Throughout, the symmetry and resulting connections Waterhouse establishes between different animals and plants, along with abstract designs, point towards God as the ultimate designer.[41] Terracotta – inexpensive and easy to procure in large pieces, as well as conducive to moulding the extensive animal sculpture Owen demanded for his museum – added a sense of warmth and naturalism with its mottled colouring.[42] Architectural historian Mark Girouard writes that Waterhouse exploited the terracotta's gradations of colour almost like a watercolourist (fig. 1.13).[43] Even the variegated terracotta brickwork, together with the multi-coloured stained glass in the central and north halls, the painted ceiling panels of botanical specimens and the geometric patterned mosaic floors, creates the effect Ruskin sought in his call for different materials to be combined into glowing patterns of colours, contributing to the atmosphere of an early cathedral (figs 1.15, 1.16).[44] On the experience of these architectural elements, Owen described an almost religious experience of moving from darkness to light:

> I need only ask the visitor to pause at the grand entrance, before he passes into the impressive and rather gloomy vestibule which leads to the great hall, and prepares him for the flood of light displaying the richly-ornamented columns, arcades, and galleries of the Index Museum.[45]

The clearest expression of natural theology in the Museum's design was in the order of nature imposed on the collections and its reflection in the internal and external ornamentation. Galleries were divided into those dedicated to extinct organisms, as well as mineralogy and geology – i.e. the non-living – in the east wing and those dedicated to extant organisms in the west wing.[46] Plans from the Museum's first *General Guide* demonstrate this division with the galleries of 'Recent Zoology' along the left half of the ground floor and Palaeontology on the right, the Mammal Gallery inhabiting the left wing of the first floor, mirrored by the Mineral Gallery on the right (figs 1.16, 1.17).[47] The animal sculpture lining the

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history might afford subjects for architectural ornament; and at Mr Waterhouse's request I transmitted numerous figures of such as seemed suitable for that purpose'.

[41] Holmes, 'Cathedral to Nature'.

[42] W.H. Flower wrote that Waterhouse chose the Romanesque style because he intended to use terracotta as the primary material, and its irregularities of colour would not suit a Renaissance programme. Flower, *A General Guide to the British Museum (Natural History),* (London: British Museum (Natural History), 1886), 12.

[43] Girouard, 56.

[44] Girouard, 58-59.

[45] Owen, 'Address to the Biological Section', 10.

[46] John Holmes suggests the orientation marked the East as representing 'the dawn of life'. Holmes, 'Cathedral to Nature'. Stephen T. Asma suggests that the segregation of contemporary and extinct forms is a Cuvierian ethos. Asma, *Stuffed Animals and Pickled Heads: The Culture and Evolution of Natural History Museums* (Oxford: Oxford University Press, 2001), 140-42.

[47] The second floor was closed to the public.

façade echoed the interior organisation by representing extinct species on the right, including a giant tapir, a sabre-toothed cat and a pterodactyl, mirrored by contemporary species, such as a wolf, a lion and a bald eagle, on the left (figs 1.18-1.21). This biblical scheme represented a natural history marked by dramatic historical changes brought on by acts of God, such as the flood in Genesis, rather than gradual, continual ones accumulated through natural processes. Crowning this architectural tome of creation was a statue of Adam, originally installed atop of the central gable (fig. 1.22).[48] In his writing, Owen explicitly connected knowledge of nature to Adam in paradise, and the Natural History Museum architecture made manifest man's 'struggle to acquire that most precious commodity – the truth as it is in Nature, and as manifested by the works of God'.[49] Although the design had initially incorporated Eve alongside Adam, the female figure was removed, leaving the first man to represent humanity's place within nature, above and separate from the animals.[50]

Yet, regardless of the strong religious overtones of the architectural programme and its implications for gender, analysis of Owen's beliefs complicates such a straightforward reading. The common conception that Owen had bequeathed an impossible building fraught with creationist ideology onto his evolutionist successors overlooks the reality of his complex and sometimes contradictory views.[51] Owen's methods and alliances may have been as much a result of strategic career manoeuvring as any deeply held faith. As Rupke writes, 'Owen was allowed to enter the privileged world of Anglican Oxbridge through the portals of Cuvierian functionalism, with Buckland assuming the role of gatekeeper.'[52] In any case, although Owen propagated special creation in his early career, by as early as the beginning of the 1840s he had given up such literal interpretations of the Bible. The idea that Owen remained a creationist throughout his career is in essence a well-perpetrated myth that began with his clash with Darwin following the publication of *On the Origin of Species*.[53]

Owen was certainly religious. He wrote that the Natural History Museum's purpose was to reveal 'the rays of the divine and eternal truth which

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[48] The statue later toppled down, either during an air raid or when someone pushed it during the Second World War.
[49] Owen, *Extent and Aims*, 2-3.
[50] Girouard, 57; Holmes, 'Cathedral to Nature'.
[51] For example, Yanni writes that 'as the decades passed, the museum's architecture lagged behind the visions of secular, evolutionist science'. Yanni, 146.
[52] Rupke, 68.
[53] Rupke, 141, 161.

have been transmitted from Above for our guidance and support'.[54] However, he also believed in evolution, albeit in a non-Darwinian form: in the same text he writes of organic nature as having 'slowly and surely evolved' and intends the galleries of the Museum to allow the viewer 'to see how the mammalian type is progressively modified and raised from the form of the fish or lizard to that of man, and to study the gradations by which one order merges into another'.[55] The monkeys that scale what looks remarkably like mammalian vertebrae running up the main architraves in the central hall suggest some type of evolution (fig. 1.23).[56] The naturalist Asa Gray even claimed that Owen's 'axiom of the continuous operation of the ordained becoming of living things' presaged Darwin's *Origin*.[57] Between the 1840s and 1850s, Owen moved away from Cuvierian functionalism and toward German *Naturphilosophie*, which held that the transcendental logic of form rather than function could explain organic diversity.[58] While functionalism remained firmly rooted in the old guard at Oxbridge, the ideas surrounding *Naturphilosophie* were imported from Edinburgh and the continent, and by mid-century became current among metropolitan scientific circles.[59] By this time the stronghold of natural theology was already crumbling.[60] However, Owen disagreed with the theory of natural selection laid out in the *Origin*. According to Rupke, the backlash from the Darwinians has tarnished Owen's reputation and skewed the understanding of his work ever since.[61] This fallacy may equally have distorted interpretations of the Natural History Museum's architecture.

A Temple to Aesthetics

While criticism of the new Natural History Museum likely arose out of personal animosity towards Owen, it was frequently of an aesthetic nature. Owen's

[54] Owen, *Extent and Aims*, 124.
[55] Owen, *Extent and Aims*, 124, 13.
[56] Contrarily, Holmes claims that the monkeys' uniformity refutes evolutionism. Holmes, 'Cathedral to Nature'.
[57] Asa Gray, 'Natural Selection Not Inconsistent with Natural Theology' (1860), in *Darwiniana* (Cambridge, MA: Harvard University Press, 1963), 73. This text offers an insightful contemporary consideration of the relationship between natural theology and evolution.
[58] Rupke, 87-89.
[59] Rupke, 90-93.
[60] Rupke, 91.
[61] Rupke, 163-4, 37. Stearn also writes that Owen was 'feared and hated' by many of his contemporaries. Stearn, 29.

scientific ostracism probably led to some of the most vociferous criticism, in particular within scientific journals. A writer for *Nature*, an avidly evolutionist publication, engaged in a lengthy condemnation:

> The architecture of the Mammalia Gallery is very obtrusive, and its over-ornate character and the variety of tone of the terra-cotta, and the similarity of this in colour to the skulls and skeletons of the fossil mammalia, are most unfortunate… It seems a pity that some style with more repose than 'Decorated Norman' was not selected. Although very beautiful as a building, and with many features deserving high praise from an architectural point of view, it is evidently not the style best adapted to set off natural-history specimens.

Despite these latter concessions, the writer goes on to lambast the decoration:

> If it was necessary to fashion all the ornaments from natural-history objects, it is a pity that the restorations were not accurately made. The oft-repeated figure of a Dapedius swallowing a fish almost its own size, and of spiral shells bent to accommodate them to the mouldings of an arch, is not instructive. The humour of ornamenting (?) the arch leading into the pavilion with a hideously represented Archaeopteryx in high relief, repeated a dozen times, is not obvious, but some joke must doubtless be intended.[62]

A year and a half later, *Nature* reported on the unimproved conditions of the Museum design with the addition of display cases, claiming that the incongruous specimen cases 'destroy' the overly ornamental architecture and again complaining about the unsuitability of terracotta with its 'peculiar tint'.[63]

Rather than damning the ideological message of the Museum, such criticisms focussed on the perceived excessive ornamentation and its unsuitability for a museum of natural history. A writer for *The Field* similarly disparaged Waterhouse's decorative programme, describing the Museum as 'ornamented – if so it may be termed – both externally and internally with incorrect and grotesque representations of animals, the style of the building being more, much more adapted for a suburban tea-garden than a national museum'.[64] This statement evinces the subtext that runs throughout contemporary criticisms of the Natural History Museum architecture: its decorativeness was incompatible with serious science and its practice in an urban setting, signifying instead a feminised space more suited to the domestic suburban realm. Such criticism was consistent with

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[62] 'The New Museum of Natural History', *Nature* (21 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[63] 'The New Natural History Museum', *Nature* (16 Nov. 1882), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[64] *The Field* (28 Apr. 1881), quoted in Stearn, 49.

earlier objections to the location in the suburb of South Kensington and its emerging profile as a museum and shopping district.

Nevertheless, the architecture and its decoration also received praise. Following a lengthy appraisal of the collections, a writer for *The Saturday Review* wrote: 'The building itself seems to be in every way commodious and spacious, as well as a striking piece of architecture.' The reviewer continued:

> Mr Waterhouse has displayed great ingenuity in his interior decorations. The walls and supports are covered with designs, in relief, of animals, reptiles, and fishes, drawn with a truth and picturesque freedom which remind us of Japanese metal-work. The designs on the western side of the building are taken from living organisms, while those on the eastern are altogether decorations of fossil forms, often excessively grotesque in outline.[65]

References to Japanese craftwork and grotesques suggest influences from the Far and Middle East that were currently popular in interior decoration. Small roundels spaced between windows on the façade featuring shells, insects, flowers and fossil forms evoked the Japanese influence in recent art and design (figs 1.24, 1.25). Consequently, another critic labelled the architecture 'quite modern in feeling',[66] confirming the *Saturday Review* writer's conviction that the Museum's 'strangeness … to unfamiliar eyes is probably the reason why this beautiful building has not been universally approved of. In architecture, more than in any other art, popular taste is swayed by the personal or the accidental.'[67]

These appraisals suggest an altogether different reading of the architecture from the commonly accepted notion of it being outdated ideologically and formally by the time it was built. When examined according to contemporary artistic rather than scientific criteria, the Natural History Museum can be seen as a highly fashionable edifice, in line with the aesthetic ideals of current art and design movements. Owen had ties with several Pre-Raphaelites: John Guille Millais, John Everett's son, was a protégé to him, while William Holman Hunt painted Owen's portrait the year the Natural History Museum opened (fig. 1.26).[68] In South Kensington the new Museum gained closer proximity to members of the Pre-Raphaelite circle, including Millais who lived just across the Cromwell Road,

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[65] *The Saturday Review* (23 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[66] *The British Almanac Companion* (1880), 160, quoted in Bullen, 281.
[67] *Saturday Review* (23 Apr. 1881).
[68] John Everett Millais referred to the senior naturalist as 'dear old Owen', claiming he was 'a friend of the whole family, and his kindness to the younger members could hardly have been greater if they had been his own children. John Guille Millais, *The Life and Letters of Sir John Everett Millais* (Toronto: G.N. Morang, 1900), 435.

and Frederic Leighton and Lawrence Alma-Tadema, who both also lived nearby. Waterhouse's wife Elizabeth, a writer and craftsperson, became influential in the emerging Arts and Crafts movement.[69] When Owen's statue was eventually commissioned, several contributors were former members of the Pre-Raphaelite Brotherhood.[70] Perhaps looked more fondly upon by artists than his fellow scientists, it is no surprise that support for Owen and the architecture of the Natural History Museum came from those associated with artistic circles, such as Lady Eastlake, and the architect Ingress Bell, who in the *Magazine of Art* spoke of the new building in terms of the 'quintessence of nature'.[71]

However, the Natural History Museum's architecture appears to have been more in line with the budding Aesthetic Movement than the naturalism of Pre-Raphaelitism and the corresponding ideas of Ruskin and Pugin.[72] Ruskin condemned the 'accursed mess' of the architecture, whose mechanically replicated sculpture and use of reinforced terracotta in his eyes constituted 'the worst bit of jobbery we've done in London'.[73] While the design reform movement of the midcentury promoted 'honest' design that eschewed deception, inspired by Pugin's and Ruskin's writing and embraced by Henry Cole in the construction of the South Kensington Museum, this ethos largely dissolved in the subsequent Aesthetic Movement.[74] Along with the feminine implications of Aestheticism's decorative emphasis, this perceived amorality produced associations of effeminacy and degeneracy.[75] The profuse and flamboyant decoration of the Natural History Museum flouted the earlier ideals of moral restraint and truthfulness in design.

Apart from its general medievalist sympathies, the aspect of the architecture most strongly resonant with Aestheticism and the nascent Arts and

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[69] Elizabeth Waterhouse ran a metalworking class in Yattendon, Berkshire from 1890 which gained some renown. See *The Studio* 17 (1899), cited in 'Waterhouse Collection, Special Collections', *University of Reading website* <http://www.reading.ac.uk/special-collections/collections/sc-waterhouse.aspx> accessed 19 Nov. 2013.
[70] These included Millais and Frederic Leighton. 'Owen memorial reports' (21 Jan. 1893 and 3 June 1897), Owen Collection 38, NHM Archives. My thanks to John Holmes for directing me to these records.
[71] Ingress Bell, 'The New Natural History Museum', *The Magazine of Art* 4 (1881), 360.
[72] Caroline Arscott writes that the artists associated with the Grosvenor Gallery (opened in 1877), the hub of the Aesthetic Movement, rejected the authenticity of detail embraced by Ruskin and the Pre-Raphaelites. Arscott, *William Morris and Edward Burne-Jones: Interlacings* (New Haven: Yale University Press, 2008), 11.
[73] John Ruskin to Henry Swan, curator of Sheffield Museum (15 Nov. 1883 and 8 June 1882), quoted in Bullen, 280.
[74] Cohen, 18-21.
[75] Arscott, *Interlacings*, 11-12.

Crafts movement was its ceiling decoration (fig. 1.27). Comprising numerous distinctive sections of panels painted with decorative botanical imagery, they were executed by the firm Best & Lea of Manchester but were almost certainly based on Waterhouse's designs.[76] The diverse designs respond to variances within the architecture: while the lower panels show 'representations of foliage treated conventionally', Waterhouse wrote that the upper panels feature 'more variety of colour and the designs will be of an archaic character. The chief idea to be represented is that of growth. The colours will be arranged so that the most brilliant will be near the apex of the roof.'[77] These latter colourful 'archaic' panels lining the uppermost sections of the roof in the central and north halls are especially reminiscent of contemporary design within the Arts and Crafts circle, including those by William Morris and Walter Crane (figs 1.28, 1.29).[78] More simplified and iconic than the more naturalistic panels below, Waterhouse titled these vivid panels archaic for their strong outlines and flattened stylisation, heightened by gilded details. They are surrounded by heavy borders with medieval-style geometric patterning. Featuring plant life including pomegranate, aloe and Brazil nut, some are unidentifiable due to their heavy stylisation and lack of labelling.[79]

In contrast, the lower ceiling panels are rendered more illusionistically, with naturalistic colouring, and include Latin specimen names (fig. 1.30). Mostly portraying plants with ties to contemporary Europe, these panels advance the British Empire, with specimens relevant to its collecting, scientific and trading activities, including balsam, maize, tobacco, cotton, cocoa and coffee.[80] Others suggest Biblical associations, for example with figs, olives and grapes.[81] Due to the designs' flattened forms, reminiscent of preserved herbarium specimens, in their study of the Natural History Museum's ceiling frescoes, botanists Sandra Knapp and Bob Press suggest keeper of botany William Carruthers presented

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[76] None of the original cartoons exist. Sandra Knapp and Bob Press, *The Gilded Canopy: Botanical Ceiling Panels of the Natural History Museum* (London: Natural History Museum, 2005), 20.
[77] Alfred Waterhouse, *The British Architect and Northern Engineer* (June 1878), quoted in Knapp and Press, 19.
[78] On evolutionary growth in Morris's design, see Arscott, 'William Morris's Tapestry: Metamorphosis and Prophecy in *The Woodpecker*', *Art History*, special issue: The Clever Object, ed. Matthew C. Hunter and Francesco Lucchini, 36.3 (June 2013), 608-25.
[79] Knapp and Press, 51.
[80] Knapp and Press, 32, 63-66.
[81] Knapp and Press, 33.

Waterhouse with models for these panels.[82] But this seems just as likely a stylistic decision. While they are more didactic than the archaic panels, the lower panels are nevertheless decorative, featuring medieval-style script, all over patterning and heavy gilding. With many of the panels depicting trees – and some including insects, birds and other animals – they create a canopy effect in accord with the cathedral of nature and Waterhouse's intended impression of growth, as well as popular contemporary design. The balcony ceilings of the first floor possess the most abstracted elements within these frescoed panels, as they exclusively contain stencilled forms of birds, dragonflies, moths, butterflies, floral paterae and octopi (fig. 1.31). They are reminiscent of Roman and even Minoan decoration but also of the 'geometrical style' popularised in mid-Victorian design by Owen Jones's *The Grammar of Ornament* (fig. 1.32).[83] In his highly influential 1856 sourcebook, Jones advocated for 'true art consisting in idealizing, and not copying, the forms of nature', a principle that seems to have guided the ornamentation throughout the Natural History Museum.[84]

Thus the Museum's design embraced principles of art and nature that went beyond a sheer religious adoption of the neo-Gothic. As well as reflecting his support of the Pre-Raphaelites and their circles, the architecture can be understood as manifesting Owen's particular vision of evolution, represented by the themes of botanical 'growth' and variation of the ceiling panels and the 'gradations' of life in the sculpture throughout. Even the use of terracotta suggests geological striation in the exterior horizontal striping effect (fig. 1.33).[85] Rather than simply employed for its appropriateness for incorporating organic sculpture, Phillip Kent argues that the Romanesque style embodied primitive implications that reflect the contemporary fascination with racial evolution in humans, as a 'product of that moment when classical purity was overwhelmed by the tribal culture of Saxons

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[82] Knapp and Press, 52.
[83] See Nicholas Frankel, 'The Ecstasy of Decoration: *The Grammar of Ornament* as Embodied Experience', *Nineteenth-Century Art Worldwide*, 2.1 (Winter 2003), <http://www.19thc-artworldwide.org/index.php/winter03/246-the-ecstasy-of-decoration-the-grammar-of-ornament-as-embodied-experience> accessed 30 Nov. 2013.
[84] Owen Jones, *The Grammar of Ornament* (London: Day and Son, 1856), 154. Arscott notes that Jones's geometrical aesthetic was not strictly visual or superficial but determined by the life force and depth within nature. Arscott, *Interlacings*, 40.
[85] My thanks to Petra Lange-Berndt for suggesting this connection. Phillip Kent calls the exterior 'a three-dimensional representation of evolution' though his evaluation does not take into account the distinction from natural theology. Kent, 'Survival of the Fittest: The Romanesque Revival, Natural Selection, and Nineteenth century Natural History Museums', *Fabrications*, 11.1 (July 2000), 2.

and Vandals'.[86] In contrast with theories of the natural history museum – and in particular that in London – as representing the 'fixation and the denial of time', the Museum's architecture manifests a profound sense of history in its 'unique blend of "primitive" and civilised associations'.[87]

Although some of the formal details of the neo-Romanesque building may appear 'crude like the objects of natural history', overall the architectural programme reveals a sophistication that is on par with many of its more refined specimens and establishes its cultural relevance.[88] The vibrant ceilings, combined with the glowing stained glass, terracotta patterning and prolific sculptural ornamentation throughout guaranteed that instead of an austere temple for undertaking scientific practice and educating the working classes, the Museum delivered a jewel-like interior, relevant to local shopping culture, and to contemporary interior design. The architect Robert Kerr, whose own design had placed second in the 1864 competition for the Museum's architecture, lambasted Fowke's original design for putting forth a '*Bazaar* principle' stemming from the Crystal Palace and the 1862 International Exhibition building, hence relegating 'the character of science to that of show'.[89] The characteristics of such architecture included great height and width and top lighting, all of which Waterhouse's final design maintained.

As proscribed by Owen Jones – he himself responsible for several examples of 'bazaar' architecture in the West End, including the Crystal Palace Bazaar shopping galleria on Oxford Street (fig. 1.34)[90] – the decoration and in particular the animal sculpture was intended by Owen and Waterhouse to function didactically and hence could be 'textualized'.[91] But certain critics belittled this pursuit, instead associating the ornamentation not simply with outdated scientific ideas, but with the commercial showiness of the bazaar or suburban domesticity and the threat of these allegedly frivolous, feminised realms' encroachment on the sanctioned space of the national museum and the scientific domain. Analogously, Erika Rappaport has examined how London's expanding feminine shopping

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[86] Kent, 11.
[87] Mieke Bal, 'Telling, Showing, Showing Off', in *Double Exposures: The Subject of Cultural Analysis* (New York: Routledge, 1996), 16; Kent, 11.
[88] Kent, 14.
[89] Robert Kerr, 'Kensington Museums: Competition of Architectural Designs', undated, O.DES/2, NHM Archives, quoted in Yanni, 123. Emphasis in original. For further analysis of the debate between Kerr and Fowke's architectural principles, see Yanni, 122-25.
[90] Jones also designed the R. and C. Osler Gallery, a glassware shop also on Oxford Street. Yanni, 123.
[91] Frankel.

culture with its aimless walking, gazing and consuming, threatened the previously masculine domain of the *flâneur*.[92] The extension of this apparent usurping into the territory of the museum is not unreasonable when one considers that the new department stores sometimes surpassed museums with their displays, their departmental heads referred to as 'curators'.[93] Thus, resistance to the new Natural History Museum's architecture can equally be ascribed to discomfort with its avant-garde and commercial aesthetics and their gendered associations as to any ideological opposition based in religion or science.

Owen's Vision

Intrinsic to the architecture was the Index Museum for which the distinctive bay-lined central hall was designed – since its inception, the space has been treated as synonymous with the Natural History Museum's interior architecture, as representing a cathedral of nature. However, it also functions as an index to the Museum's shifting gender politics and as such facilitates analysis of the power relations of objects on display. Owen had planned an object-based encyclopaedia of the collections to feature in the Museum since his earliest plan of 1859, in which it was given the label of 'General or Typical' collection. 'This would constitute an epitome of natural history, and should convey to the eye in the easiest way, an elementary knowledge of the sciences,' he wrote.[94] The bays lining the hall were each meant to provide overviews of different classes and orders. 'Thus the design of the lateral recesses is to convey an outline, as it were, of the divisions of Natural History, which will be fully and systematically illustrated in the several Galleries of the Museum.'[95] Owen explained:

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[92] Erika Rappaport, *Shopping for Pleasure: Women in the Making of London's West End* (Princeton, NJ: Princeton University Press, 2000), 116-17. Elizabeth Wilson has suggested that the *flâneur* in fact marks 'a fictional embodiment of a crisis in masculinity' that requires deconstruction, though this task lies outside the parameters of this thesis. Correspondingly, Lynda Nead argues that middleclass women were involved in public urban life outside of the arena of shopping. Wilson, 'The Invisible *Flâneur*', *New Left Review* 171 (Jan./Feb. 1992), 109; Nead, *Victorian Babylon: People, Streets and Images in Nineteenth-Century London* (New Haven: Yale University Press, 2000), 68-70.

[93] Christopher Breward, 'Aestheticism in the Marketplace: Fashion, Lifestyle and Popular Taste', in Stephen Calloway and Lynn Federle Orr, eds, *The Cult of Beauty: The Aesthetic Movement 1860-1900*, exh. cat. (London: V&A, 2011), 199.

[94] Owen, 'Report to the Commission of the Advancement of Science', 22, quoted in Owen, 'Address to the Biological Section', 3.

[95] Owen, *Index Museum. Report by the Superintendant of Natural History* (British Museum (Natural History) (19 July 1880), 3, *Folder 11: Printed papers on the Index Museum and the new*

> The Bays are numbered I to X. If the Visitor begins with the last and proceeds to view them in the reverse order, some notion may be formed of the stages by which organisms have risen from the Monad to Man.[96]

Specifically, as illustrated by Owen's more developed plan for the proposed Index Museum of 1879 (fig. 1.35), surveying the bays in a clockwise manner, one would first come across illustrations of 'the chief varieties of the Human race', the next two recesses would be devoted to other mammals, followed by birds, reptiles and fish; on the other side the bays were to be devoted to invertebrates, including molluscs, 'articulata' (including spiders, insects and crustaceans) and 'radiolaria' (including various marine invertebrates and protozoa, or single-celled creatures), followed by the 'vegetable kingdom', 'rocks and fossils', and finally crystals.[97] Rather than 'monad to man', much like the external architecture with Adam at its top, the order emphasised a hierarchy within nature from man to monad. Furthermore, the ostensibly objective 'encyclopaedia' gave uneven emphasis to existing mammals over extinct species, and animals generally over plants and minerals (as keeper of geology Henry Woodward grumbled).[98]

Contradictorily, alongside this 'Hall of Types', Owen intended the floor of the central hall for the exhibition of rare and striking specimens bearing remarkable size or 'some prominent quality'.[99] For example, Owen proposed a whale skeleton (being the largest aquatic animal), an elephant skeleton (as the largest quadruped), a megatherium or extinct giant sloth skeleton (having the 'most robust frame' in the animal kingdom), a giraffe skeleton (as the tallest mammal), a *Dinornis maximus* or ancient moa (the tallest and largest bird) and a skeleton of a male great Irish elk ('as exhibiting maximum development of weapons of offence').[100] This scheme was quite at odds with the purported purpose of the Index Museum, since rather than the typical it emphasised the exceptional. Owen's idea of a Type or Index Museum was derived from Cuvier's

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museum, 1880-1881, A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

[96] Owen, 'Owen's MSS of Guide for Index or Type Museum', 265, in W.G. Ridewood, *Notes on the history of the Index Museum, 1880-1917* (1917), Index Museum, DF938/22-32, NHM Archives. Monad is a now dated term for single-celled organism.

[97] Owen, *Index Museum. Report by the Superintendant of Natural History*, 1.

[98] Henry Woodward, *Report by the Keeper of Geology, British Museum (Natural History)* (21 July 1880), 7, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

[99] Owen's MSS (1879), 220, in W.G. Ridewood, *Notes on the history of the Index Museum, 1880-1917* (1917), Index Museum, DF938/22-32, NHM Archives; Owen, *Index Museum. Report by the Superintendant of Natural History*, 4.

[100] Owen, *Index Museum. Report by the Superintendant of Natural History*, 4.

type concept, 'whereby groups of existing organisms could be visualized by a religious mind like Owen's as variations on an archetype, or original model divinely conceived before their creation', according to botanist William T. Stearn's history of the Museum.[101] The envisioned exhibition in bays resembling side-chapels support this natural theologian reading. However, the exoticism and rareness of the animals destined for the floor were more in the vein of the older exhibition model of the cabinet of curiosities, which spoke to God's wonders, or to the contemporary but distinctly othered exhibition space of the fairground, which with its irrational and chaotic displays, sociologist Tony Bennett calls 'the museum's own pre-history come to haunt it'.[102]

The allusion to earlier display models is significant. In the 1850s when Owen began his plans for the new Natural History Museum, the public museum was still a relatively recent phenomenon. At this time, it was standard for natural history museums to put as many of their specimens on public view as possible, hence the drive to remove the British Museum's natural history collections from Bloomsbury in the first place: Richard Owen's desire for tens of thousands of square metres emerged out of his ambition to put the entirety of the collections on display. Compared to the endless rows of virtually indistinguishable specimens, the 'elementary' Index Museum was 'devised to convey to the great majority of the visitors to the New Museum, who are not Naturalists, as much information and general notions of its aim as the Hall they will first enter and survey could be made to afford'.[103] Owen's Index Museum was not simply meant to showcase a microcosm of God's creation; it was also intended to give the layperson a user-friendly experience. Correspondingly, the superlative specimens on the floor of the central hall were intended for the amusement of this same general public. However, this experience was a concession to the primarily scientific purposes of the Museum. Owen wrote:

> A Museum of Natural History destined solely for the amusement or amazement of the general public, need exhibit only such specimens as are peculiar for singularity of size or form, beauty of colour, or other catching quality. In short, to achieve this aim, the curator need only follow the

[101] Stearn, 94.
[102] Bennett, 3. For an analysis of the relationship between the museum and the fair, especially in light of Michel Foucault's theory of the heterotopia, see Bennett, 3-11. On wonder and the curiosity cabinet, see, for example, Stephen Greenblatt, 'Resonance and Wonder', in Ivan Karp and Steven D. Lavine, eds, *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington, DC: Smithsonian, 1991), 50; and Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150-1750* (New York: Zone Books, 1998), 5.
[103] Owen, *Index Museum. Report by the Superintendant of Natural History*, 1.

> system which the mercenary showman finds most successful with the public. I need hardly say, however, that the appliances of a National Museum of Natural History are of a wider and higher nature than to gratify the gaze or the love of the marvellous in the vacant traverser of its galleries.[104]

Hence, like the Darwinians who opposed his plan and Kerr, who opposed its suggested architectural realisation, Owen too eschewed, or at least defended himself against, unscientific showmanship in the museum. Although to some extent Owen planned the Index Museum to appease the perceived public need for education and entertainment as the driving force behind the formation of the public museum, the comprehensive knowledge conveyed by the special department was equally intended to fulfil its namesake as an index for more serious visitors to consult, as a 'guide-post to the useful inspection of the large and numerous series, essential to the student'.[105]

Owen's vision for the larger Museum ultimately prioritised the interests of its scientific visitors over those of the general public. However, by the time the Museum's construction was underway, Owen's exhibition ideas were rapidly becoming outdated. As early as 1864, keeper of zoology John Edward Gray campaigned against Owen's plans, condemning the then prevailing custom of placing everything on display as providing 'little less than a chaos of specimens, of which the bulk of those placed in close proximity are so nearly alike that [most visitors] can scarcely perceive any difference between them'.[106] In Gray's opinion, such a model benefitted neither layperson nor scientist. He proposed that

> a museum for the use of the general public should consist chiefly of the best-known, the most marked, and the most interesting animals arranged in such a way as to convey the greatest amount of information in the shortest and most direct manner, and so exhibited as to be seen without confusion ... . [S]uch cases would be infinitely more attractive to the public at large than the crowded shelves of our present museums, in which they speedily become bewildered by the multiplicity, the apparent sameness, and at the same time the infinite variety of the objects presented to their view.

These views and their natural consequence of separating exhibition collections from study collections were soon to be commonly adopted among natural history museums, something Owen apparently did not anticipate in 1862 when he

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[104] Owen, *Extent and Aims*, 114-15.

[105] Owen, *Index Museum. Report by the Superintendant of Natural History on the Several Reports of the Keepers of Natural History, British Museum (Natural History)* (28 July 1880), 1-2, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives. On the role of the museum as a space of 'rational recreation', see Bennett, 20.

[106] Edward Gray, 'Address at the meeting of the British Association for the Advancement of Science', Bath, printed in *Report British Association* (1864), 75-86, quoted in Stearn, 37.

predicted that his successors might look back at his plans for a two-story building covering 20,000 square metres and 'smile at the moderation or inadequacy of the present outlook'.[107]

In 1880, the new keeper of zoology Albert Günther expressed similar views to his Gray predecessor by pointing out that the Index Museum was now an anachronism harking back to 1858,

> that is, at a time when the cases had become crowded with specimens, when the separation of a study series from an exhibition series had only been commenced, when no attempt at descriptive labelling had been made, when heterogenous objects had to be exhibited in the same room, and when, consequently, the types most deserving of attention were threatened to be lost among a multitude of objects unfit for exhibition.[108]

In the same report, other keepers complained that by emphasising the extraordinary rather than the typical, the Index Museum was not true in its aims; that by ransacking the various departments for the best specimens, it would diminish the rest of the collections; that the proposed representation of the various galleries was unevenly weighted and that the architecture and lighting were 'ill-adapted for exhibition purposes'.[109] Several suggested that the aims of the Index Museum could be more efficiently achieved by better labelling throughout and a well-illustrated guidebook. By this point all of the Museum's keepers were newly appointed, with the exception of keeper of botany William Carruthers, who was the one keeper to have been on staff when plans for the new Museum began, and the only one to file a positive report on the otherwise contentious Index Museum.

A writer for *Nature* in 1881 echoed the newer keepers' complaints: 'The cathedral-like Index Museum, with its rather dark side-chapels, and the Museum of British Zoology are of proportions that will render it difficult to make an effective display in them.'[110] As well as an intended microcosm of the collections, and perhaps even of nature, the Index Museum represented a microcosm of the Museum, including its emphatically religious influence, fussy, effeminate aesthetics and early Victorian ideas about display. Rupke connects the setting of Owen's scholarly background to his work as a palaeontologist: 'The functionalist dictates of Oxbridge, those cities of Gothic architecture, inspired the

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[107] Owen, *Extent and Aims*, 77.
[108] Albert Günther, *Report by the Keeper of Zoology, British Museum (Natural History)*, 21 July 1880), 5, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.
[109] Woodward, 7.
[110] 'The New Museum of Natural History', *Nature* (21 Apr. 1881).

reconstruction of Owen's most renowned and Gothically bizarre museum objects.'[111] Much like dinosaurs represented Gothic specimens, evocative of the monsters found in popular contemporary fiction, with its soaring cathedralesque architecture and specimens both taxonomical and monstrous the envisioned Index Museum was a Gothic space, one which, like Owen himself, had become rather unpopular in the later nineteenth century. The proposed collection and its containing architecture were orderly yet excessive, accurate yet flamboyant.

Flower's Reality

Beyond its architecture, Owen's plans for the Index Museum remained purely theoretical. Owen retired in December 1883, age seventy-nine, only two and a half years after the Natural History Museum had opened its doors. He was promptly knighted and his post retroactively upgraded to the title of Director of the Natural History Museum.[112] At this time, the departments of zoology, botany, geology and mineralogy had only just been removed from Bloomsbury; there had not been a chance to begin work on the 'fifth department' of the Index Museum.[113] However, W.H. Flower soon replaced Owen as director, and proceeded to develop plans for the displays in the Index Museum: these were well under way within a few years, and appeared to be complete by the mid-1890s (fig. 1.36). *The Times* wrote:

> Under the presidency of Charles Darwin, whose statue commands the index museum from the principal staircase, the happy idea of Sir Richard Owen, of an index to the entire animal creation, is being steadily carried out by Professor Flower and his colleagues.[114]

It seems surprising that Flower should have devoted himself to carrying out Owen's plans: as a firm evolutionist, his differences in ideology would presumably result in diverging ideas about museum display. Indeed, Flower endeavoured to distance his realisation of the space from Owen's intentions as much as possible. Already in the first *General Guide* Flower published in 1886 (much to the satisfaction of the keepers), he admitted that the title of Index

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[111] Rupke, 53. For more on the 'Victorian dinosaur', specifically in relation to Owen's thought and practice, see W.J.T. Mitchell, *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago: University of Chicago Press, 1998), 124-28.
[112] Stearn, 63.
[113] A.E. Günther, *Founders of Science*, 144; Flower, *General Guide* (1886), 17.
[114] 'The National Collections of Natural History', *The Times* (6 Aug. 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Museum was inaccurate, since rather than 'a sort of epitome or index of the main collections in the galleries', it was 'more like the general introduction'.[115] He titled the exhibition the Introductory or Elementary Morphological Collection.[116] However, the label Index Museum remained in use, including by Flower himself, long past his tenure as director. Flower made it clear that had the Museum been designed under him, it would have looked and functioned very differently – he criticised the limitations of space and lighting as well as the outdated departmental divisions into extinct and living, and even vegetable, animal and mineral.[117] His scarce mention of Owen and clear downplaying of his contributions to the Museum undoubtedly reflected the latter's current lack of popularity among the scientific community, a fact which likely led to Flower's own appointment.[118]

However, the assumption that the Index Museum, like the rest of the Natural History Museum's architecture, was incompatible with an evolutionary perspective is not entirely accurate.[119] The Scottish biologist and sociologist Patrick Geddes developed a plan for an index museum which treats the philosophy of evolution as intrinsic to its functioning: more wide-ranging than Owen's plan, and charting social developments alongside natural ones, he compared its galleries to branches on the tree of evolution.[120] Geddes drew on the Index Museum in the Natural History Museum as inspiration for his theory.[121]

Owen's plans for the Index Museum also found resonance with the ideas of Lieutenant-General Augustus Henry Lane Fox Pitt Rivers, who, like Geddes, believed in a Darwinian version of anthropology. His original plan for the Pitt Rivers Museum was based on a series of galleries forming concentric circles. Flower described what he considered this 'most original and theoretically most perfect plan for a museum of exhibited objects':

> Each circle would represent an epoch in the world's history, commencing in the centre and finishing at the outermost, which would be that in which we are now living. The history of each natural group would be traced in radiating lines, and so by passing from the centre to the circumference, its

[115] Flower, *General Guide* (1886), 23.
[116] Flower, *General Guide* (1886), 17-18.
[117] Flower, *General Guide* (1886), 13, 16-17.
[118] Stearn, 67.
[119] For example, see Stearn, 56-57.
[120] Patrick Geddes, 'The Index Museum: Chapters from an Unpublished Manuscript' (c. 1902), *Assemblage* 10 (Dec. 1989), 66, 68, 67.
[121] Alessandra Ponte, 'Building the Stair Spiral of Evolution: The Index Museum of Sir Patrick Geddes', trans. Jessica Levine, *Assemblage* 10 (Dec. 1989), 58. While Ponte acknowledges Owen's ideas, it should be noted that Geddes referred to the Index Museum as arranged by Flower, c. the turn of the century.

> condition of development in each period of the world's history could be studied.[122]

Flower celebrates Pitt Rivers' exemplary vision of what Bennett describes as an autodidactic 'organized walking through evolutionary time'.[123] Yet Pitt Rivers' plan is surprisingly similar to Owen's much earlier preliminary plan for the Natural History Museum, which pictures the Index Museum as forming a circular design (along with the British Collections) with displays radiating in straight lines from the centre (fig. 1.37). Owen described his original plan as follows:

> An Exhibition-room of a circular form is that which admits of the most effective and economic supervision; and the series of specimens there proposed to be displayed are of a nature that would be the most profitably shown to, and studied by, the wage-classes after the hours of work.[124]

While Pitt Rivers' circular plan marked an ideal, ultimately unrealisable gallery design, Owen planned his out of practicality, not to mention familiarity – it is notable that Sydney Smirke's central, circular, radiating design for the Reading Room of the British Museum was completed two years before Owen drew up his plan (fig. 1.38).[125] Architectural historian Sophie Forgan notes that in the nineteenth century museum architecture was commonly modelled after libraries, as the museum itself was expected to function like an encyclopaedia of knowledge: in the natural history museum the connection corresponded with the popular metaphor of the Book of Nature as well as the divine book of the universe.[126] However, a circular plan was ultimately abandoned in Waterhouse's adaptation of Fowke's design in favour of the rectangular hall which gives the Museum interior its cathedralesque atmosphere.[127]

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[122] Flower, 'Modern Museums': Presidential Address to the Museums Association, London, (3 July 1893), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 48. Pitt Rivers elaborated these ideas in his Presidential Address to the Anthropological Section of the British Association, Bath (1888), and later published them in *Journal of the Society of Arts* (18 Dec. 1891). For an analysis of the significance of Pitt Rivers's museum planning for material history, see Susan Pearce, *Museums, Objects and Collections: A Cultural Study* (Leicester: Leicester University Press, 1992), 85-86.

[123] Bennett, 186.

[124] Owen, *Extent and Aims*, 85.

[125] Smirke was also responsible for a key example of bazaar architecture in the New Panthéon (1834) on Oxford Street.

[126] Sophie Forgan, 'Bricks and Bones: Architecture and Science in Victorian Britain', in Peter Galison and Emily Thompson, eds, *The Architecture of Science* (Cambridge: MIT Press, 1999), 192.

[127] Michel Foucault suggests that the rectangular 'table' of nineteenth-century natural history had replaced the circular 'show' or procession of the Renaissance bestiary. Foucault, *The Order of Things: An Archaeology of the Human Sciences* (1966) (London: Routledge, 1989), 143. The ultimate adoption of the rectangular model for the Natural History Museum creates an interesting tension with criticism of the architecture's showiness, while the evolutionary radiating circle presents yet another model in its departure from the earlier century's emphasis on tabulation.

For all Flower's emphasis on the differences between his and Owen's versions of the Index Museum, some key aspects remained strikingly similar, in particular their textual orientation. The bays of the central hall retained their 'man to monad' layout so to provide an introduction to the broader collections, again starting with humans and leading towards single-celled organisms and the vegetable kingdom.[128] Flower specified this order in the *General Guide*:

> In examining this collection the visitor should follow each case in the usual order of reading a book, from left to right, and should carefully study all the printed explanatory labels, to which the specimens are intended to serve as illustrations.[129]

This literary emphasis corresponded to and sustained Owen's original intention of the collection to function as an encyclopaedia. Michel Foucault writes, 'Natural history is nothing more than the nomination of the visible,' implying that a linguistic order is fundamental to the practice's mode of categorisation.[130] This conception is implicit in both Owen's vision and Flower's realisation of the Index Museum, particularly in the latter's insistence on extensive labelling.

But while Owen's campaign for encyclopaedic nomination stemmed from natural theological ideas, Flower's approach was patently Darwinian. In the early days of his campaign for better accommodation for the national collections of natural history, Owen drew on Biblical analogies:

> Our present system of opening the Book of Nature to the masses, as in the galleries of the British Museum, without any provision for expounding their language, is akin to that which keeps the Book of God sealed to the multitude in a dead tongue.[131]

Meanwhile, Flower's linear arrangement echoed the evolutionary tree of life, as interpreted by Ernst Haeckel, the eminent biologist and populariser of Darwin's theory within the German-speaking world; Haeckel's tree, illustrated by the nationalistic symbol of the German oak, emphasises a hierarchy within animal life from single-celled organisms, or monera, at the very base to 'man' at its uppermost branches, not unlike Adam's position atop the Natural History Museum (fig. 1.39). Flower explained botany's corresponding position within the scheme of the Index Museum:

> By this arrangement the lowest or simplest forms of animal or plant life, those on the border land, as it were, of the two kingdoms, will be brought

[128] Flower, *General Guide* (1886), 23-26.
[129] Flower, *General Guide* (1886), 23.
[130] Foucault, *Order of Things*, 144.
[131] Owen, 'Address as President, British Association, Leeds' (1858), quoted in A.E. Günther, *Founders of Science*, 118.

> into contact, and at the two ends of the series, in Bays I. and X., will be found the groups which show in the highest degree the special attributes of the division to which they belong.[132]

Notwithstanding the teleological implications of this arrangement, Flower's stated intention to bring together plant and animal life marks a focus on development over distinction, connection over division, that differs from Owen's conception of nature.

In practice the materiality of objects and affect of display architecture belied the textual rhetoric in both cases. Owen insisted, 'No collection of Zoology can be regarded as complete that does not contain illustrations of the physical or natural history characters of the human kind';[133] however, the British Museum's ethnographic collections ultimately remained in Bloomsbury.[134] Flower on the other hand held progressive views against the division of ethnography from art.[135] Nevertheless, both curators included human displays in their plans for the Index Museum. But whereas Owen proposed a distinct display in its own separate bay to illustrate the 'typical characters of the chief varieties of the Human race, and the structures on which are founded the sub-class *Archencephala*, and the order *Bimana*',[136] these two outdated terms denoting humans as a separate subclass of mammal, Flower's mammal display showed the skeleton of a man (presumably of European descent) alongside not only a much smaller skeleton of a woman belonging to the indigenous Akha tribe, but also one of a gorilla (fig. 1.40). Although Owen recommended skeletons 'of every variety' to be arranged side by side in a display of physical ethnology, one can be sure he did not intend inclusion of the non-human.[137]

While this case made the clearest pronouncement of the Darwinian descent of humans from other animals, most recently the great apes, other displays that lined the bays also emphasised the evolutionary adaptation of species. Some highlighted the similarities and differences between the skeletons, teeth, skin, hair, horns or antlers, and claws or hooves of various mammals, and the beaks, feathers, wings and tails of birds, employing extensive labelling (figs. 1.41, 1.42).

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[132] Flower, *General Guide* (1886), 26.
[133] Owen, *Extent and Aims*, 61-62.
[134] That is until they were moved to the Museum of Mankind at 6 Burlington Gardens in 1970. The department of ethnography moved back to the British Museum in Bloomsbury in 2004.
[135] See Flower, 'Museum Organisation': Presidential Address to the British Association for the Advancement of Science, Newcastle-on-Tyne (11 Sept. 1889), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 9.
[136] Owen, *Index Museum. Report by the Superintendant of Natural History*, 2.
[137] Owen, *Extent and Aims*, 62.

Rather than simply showing intact type specimens – individuals designated as archetypal examples of their species – this introductory exhibition presented bones and dissections and their implications for species' function and development. One case contained skeletons of a horse and a man, the latter appearing to attend to the former, both partially surrounded by 'skin' (papier-mâché in the case of the man) and thus 'arranged for comparison with each other, and also to show the position of the bones of both in relation to the external surface' (fig. 1.43).[138] Both specimens were dotted with labels identifying the principle bones to provide 'instructive lesson in comparative anatomy'.[139] Such displays literally tore specimens apart to expose their insides and constituent parts, much in keeping with Foucault's characterisation of evolutionism as replacing a taxonomy of surfaces with interactive interiors.[140] Instead of 'the type-characters of the principle groups of organized beings' which Owen had intended to 'convey an outline, as it were, of the divisions of Natural History'[141] – in other words, categorisation – Flower's interpretation of the Index Museum emphasised shared principles within nature, often which crossed departmental and species boundaries.

Apart from the central whale skeleton, whose inclusion had been dear to Owen's plans for the Index Museum, the displays on the floor of the central hall under Flower took a very different form from what his predecessor had envisioned. They corresponded to the function of the bays, as illustrating principles rather than categories, and hence offering not so much an index as an addendum to the departmental collections exhibited. The 1901 *General Guide* stated: 'The cases placed on the floor of the hall illustrate general laws or points of interest in Natural History which do not come appropriately within the systematic collections of the departmental series.'[142] Large rectangular vitrines contained various animals set against scenic backdrops in displays illustrating the 'Adaptation of Colour to Surrounding Conditions' in warm and wintry climates (figs 1.44, 1.45). The all-white specimens of the latter were not to be confused

[138] Flower with E. Ray Lankester, *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1901), 14.
[139] Flower with Lankester, 14.
[140] Here, however, Foucault positions Cuvier as the harbinger of a new paradigm within science: 'One day, towards the end of the eighteenth century, Cuvier was to topple the glass jars of the Museum, smash them open and dissect all the forms of animal visibility that the Classical age had preserved in them'. Foucault, 150.
[141] Owen, *Index Museum. Report by the Superintendant of Natural History*, 2, 3.
[142] Flower with Lankester, 9.

with those in a case illustrating the phenomenon of albinism, in which white rabbits, hares and birds were densely arranged around a tree, and which found its complementary display in the case dedicated to the 'opposite condition' of melanism, marked by an 'excess of dark-coloured pigment in the skin and its appendages, the hair, feathers, etc.'[143] – here a black leopard perched atop a tree branch, overlooking other smaller atypically dark animals (figs 1.46, 1.47). While these adaptations and anomalies demonstrated hereditary variation within nature, a vitrine full of various breeds of domestic pigeons, all perched around a stately looking birdhouse, illustrated the effects of domestication, and forged a direct reference to Darwin's opening discussion of variation within domestic pigeons to illustrate the process of natural selection in the *Origin of Species* (fig. 1.48).[144] Another case illustrated mimicry with examples of insects and other animals whose form and colour has adapted to resemble other species for protective purposes (visible in the background of fig. 1.45); in another, crows and goldfinches demonstrated the problem of dimorphism, in which ostensibly different species may in fact be one and same, thus challenging the very notion of species.[145]

Evolutionary Aesthetics

With animals mounted in varied poses set against foliage, soil and snow, Flower's vitrines for the floor of the central hall were influential in the development of naturalistic habitat groups, or 'dioramas' in other natural history museums in Europe and North America.[146] In his 1906 biography of W.H. Flower, the naturalist Richard Lydekker extolled the Index Museum's displays of animals adapting their colouration to inorganic surroundings – he claimed that the Museum had employed sand and rocks from the same locality 'so as to imitate as

[143] Flower, *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1889), 25.
[144] Charles Darwin, *On the Origin of Species* (1859), ed. Gillian Beer, rev. edn (Oxford: Oxford University Press, 2008), 19-25. Darwin's own collection of domestic pigeons had in fact entered the Museum in 1867. A.E. Günther, *Founders of Science*, 125.
[145] Flower, *General Guide* (1886), 22.
[146] On the etymology and history of the usage of 'diorama', see Karen Wonders, *Habitat Dioramas: Illusions of Wilderness in Museums of Natural History* (Uppsala: Almqvist and Wiksell, 1993), 3.

nearly as possible the natural conditions'.[147] In her history of the habitat diorama, Karen Wonders writes, 'The scientific aim of these exhibits gave legitimacy to the concept of naturalistic exhibition.'[148] But although they represented a drastically different exhibition practice from the taxonomic display of type-characters Owen envisioned, these vitrines with their crowded assortments of species – including predators and prey – grouped closely together according to shared morphological traits are not ultimately naturalistic. In addition to the clear evolutionary message and increasingly explanatory focus, these cases are equally notable for their strong design. With their colour-coded, symmetrical arrangements, the specimens within become formal components. Unlike the evolutionary narratives placed on taxidermised animals in habitat dioramas, which account for their perceived naturalism, in Flower's vitrines the heterogeneous objects contained within are united both thematically and aesthetically.

Evolutionism's apparent move away from pretty surfaces and toward gritty interiors was paradoxically accompanied by an increased emphasis on visually pleasing displays aimed at the general public. The new direction Flower took in his exhibition for the Index Museum is explained by the drive to separate collections for display from those for study. Pointing the finger firmly at Owen, Flower condemned the 'ignorant' demand that all specimens belonging to a national museum should be displayed.[149] He wrote that, however 'sublime', this notion was 'equivalent to asking that every book in a library, instead of being shut up and arranged on shelves for consultation when required, should have every page framed and glazed and hung on the walls'.[150] Instead of gearing the displays to advanced students and scientists, Flower instead wished to prioritise 'another and a far larger class': members of the public with a general interest in natural history.[151] For the general visitor, Flower suggested a 'totally different' method of exhibiting objects was required:

> In the first place, their numbers must be strictly limited, according to the nature of the subject to be illustrated and the space available. None must be placed too high or too low for ready examination. There must be no crowding of specimens one behind the other, every one being perfectly and distinctly seen, and with a clear space around it.[152]

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[147] Richard Lydekker, *Sir William Flower* (London, 1906) 65, quoted in Wonders, 102.
[148] Wonders, 102.
[149] Flower, 'Museum Organisation', 15.
[150] Flower, 'Museum Organisation', 16.
[151] Flower, 'Museum Organisation', 14.
[152] Flower, 'Museum Organisation', 17.

He furthermore admonished the prevalence in museums of the 'sadly-neglected art of taxidermy', with specimens presenting 'wretched and repulsive caricatures of mammals and birds, out of all natural proportions, shrunken here and bloated there, and in attitudes absolutely impossible for the creature to have assumed while alive'. Finally, Flower asserted that signs and labelling were paramount, claiming a museum should function as 'a collection of instructive labels illustrated by well-selected specimens.'[153]

Flower's aims for public exhibition therefore combined artfulness with didacticism. For example, he believed that taxidermy should be upheld alongside painting and sculpture.[154] The sentiment suggests a sea change in evolutionary concepts of museum display since Huxley and Darwin's opposition to the new Natural History Museum, at which point Darwin had denigrated taxidermy displays as manifesting 'a sort of vanity in the curators'.[155] Flower's successor, E. Ray Lankester, praised the earlier director's aesthetic propensity:

> He took the greatest pains to make the museum under his care a delight to the eye, so that the visitor should be charmed by the harmony and fitness of the groups presented to his notice, and thus the more easily led to an appreciation of the scientific lessons which each object has to tell.[156]

Flower's development of the public galleries, however, was not at the expense of the study or reserve collections, which formed, in his view, 'the most important part of the Museum' due to the scientific work undertaken there: 'Indeed, without the means of study they afford, the order, arrangement, and power of imparting knowledge, which the exhibition galleries possess, would not be possible.'[157] Thus, much as in Owen's assessment, the structure of the museum as exhibitionary device relied on the collection as a container of scientific knowledge.

The increasing scientific specialisation that took place towards the end of the century and the Natural History Museum's ever more popular displays appear to form a contradictory combination. It in fact seems indicative of a widening gap between the 'two classes' that the Museum catered to – the student/professional and the layperson/amateur. As much as Flower emphasised the museum's role in public education, the reality of the aestheticised displays of the Index Museum

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[153] Flower, 'Museum Organisation', 18.
[154] Flower, 'Museum Organisation', 17, 18.
[155] *Correspondence of Charles Darwin,* vol. 7, 177, quoted in Yanni, 113.
[156] E. Ray Lankester, *Nature* (13 July 1899), quoted in Stearn, 75.
[157] Flower, *General Guide* (1886), 19.

also corresponds to parallel cultural phenomena.[158] J.E. Gray's early conviction that the collections should be divided according to scientific study and public display, which Flower admiringly referenced nearly thirty years later,[159] coincided with an emerging awareness of the link between exhibition practices and commercial display. In 1864, a writer for the women's magazine *Queen* compared the universal exhibition to the shop window, both representing 'triumphs of art and manufacture'. 'After all', the writer asked, 'what are the Great Exhibitions but a sort of collective window display?'[160] Such observations align the world's fair and its descendent the museum with the uniquely feminised experience of shopping. Museum displays such as those envisioned by Gray and realised by Flower undoubtedly corresponded to the expectations of a public familiar with the lavish spectacles of the universal exhibitions, but also with the more everyday 'curated' spectacles found in the boutique and the department store. This imperative was made even stronger by the associations of the new Museum's location with the Great Exhibition of 1851 and the International Exhibition of 1862 – the site of which formed the basis of the Natural History Museum – as well as the nearby shops in Kensington and Knightsbridge.[161] Meanwhile, the neighbouring South Kensington Museum, born out of the Great Exhibition and the subsequently designated Department of Science and Art, was fostered by Albert's enthusiasm for science and technology and arranged taxonomically, including its collection of animal products.[162] The Natural History Museum's proximity to and overlap with the South Kensington Museum created a sense of continuity between the natural history collections and the peripheral associations of spectacular aesthetics.

The marriage of evolutionary teaching and aesthetically pleasing displays was integral to the exhibition in the Index Museum, with its well-labelled, accessible and attractive vitrines. Flower emphasised how good exhibition design was fundamental to understanding evolution and its visual principles:

> Our museums, when more complete and better organised, will teach us much on this branch of the subject. They will show us the infinite and

[158] Flower, 'Modern Museums', 34.
[159] Flower, 'Modern Museums', 38.
[160] *Queen* (26 Mar. 1864), 239, quoted in Rappaport, 118.
[161] For example, Whiteley's department store opened in Westbourne Grove in September 1881. Cohen, 44.
[162] See Burton, 43, 45. On the South Kensington Museum's collection of animal products, see Peter Lund Simmonds, *The Commercial Products of the Animal Kingdom Employed in the Arts and Manufactures Shown in the Collection of the Bethnal Green Branch of the South Kensington Museum* (London: Eyre and Spottiswoode, 1880).

> wonderful and apparently capricious modifications of form, colour, and of texture to which every most minute portion of the organisation of the innumerable creatures which people the earth is subject.[163]

However, ultimately Flower's legacy was rooted in his museum work rather than his work as a naturalist. His firm belief in the museum as a place of both education and entertainment, mobilised through the division of the study-series from the exhibition-series in the Natural History Museum, and his allocation of an equal amount of space and resources to each, made his methods greatly influential.[164] Lankester suggested that in particular, the Index Museum as designed under Flower might function not only as an introductory exhibition for the visitor, but also as an exemplar of display for other institutions to emulate.[165]

Conclusion

Although the exquisite, or arguably fussy architecture that preserved Owen's vision became the unlikely container for an altogether new paradigm, one concerned with nature's inner workings and development over deep time, this new model in fact transcended Owen's ideas about display in terms of aestheticism. For all Flower's professed belief in displays as mere illustrations, secondary to didactic texts, his were notable for their artful design, which resonated with visual culture beyond natural history as did many of the objects on display in the new Natural History Museum. While Owen's ark-like taxonomy purported an orderly and comprehensive overview of natural creation that maintains its own aesthetic principles, Flower's conscientious practice pushed the museum's displays towards more popular tastes and their relevant forums. Collections of artfully arranged like objects in all-glass cases suggested displays in nearby department stores, bringing the Museum's work in line with commercial display and the exploding culture of women's shopping – in the following chapters we will see how the natural history objects themselves harboured associations with the commodities on sale, including jewellery made from precious stones, glass, hummingbirds and insects. And yet in their specific exhibitionary context, these objects propelled the objectification of mounted animals in the realm of display. Parallel to the tension

[163] Flower, 'Museum Organisation', 26.
[164] Lankester, quoted in Stearn, 75-76.
[165] Flower with Lankester, 17.

between the true index and the superlative specimen in Owen's Index Museum, Flower's displays manifested contradictory goals of education and entertainment. Foucault, among others, argues that the opposition between the tabulations and taxonomies of earlier nineteenth-century 'fixism' and the dynamic sense of progress encapsulated by its supplanting 'evolutionism' is superficial: they are rather complementary facets in the development of natural history practice.[166] For all their difference and overlap, the implications these two epistemological and exhibitionary models bear on gender in the objects of natural history display will be considered in what follows. What is clear is that in the museum, in both natural theological and evolutionary models, the combined goal of spectacle and knowledge did not only overlap; they were inseparable.

[166] Foucault, 163.

CHAPTER TWO

Crystal Virtues: Ruskin in the Mineral Gallery

Surrounded by female pupils, ranging from ages nine to twenty, an elderly male lecturer recounts a dream of Egyptian gods and goddesses and the building of the pyramids. When he awoke, he claims, he held a miniaturised version of a pyramid in his hand. To counter the girls' disbelief, the lecturer presents them with the small object, which turns out to be a fine specimen of rose fluorite crystal. They are understandably disappointed, but the old man reminds them that it is not the size that matters. He says, 'The making of this pyramid was in reality just as wonderful as the dream I have been telling you, and just as incomprehensible.' He commands the girls to take the crystal away, and to think.[1]

So goes one of the many lessons illuminated by minerals in John Ruskin's 1866 volume *The Ethics of the Dust*. Although the text is fictional, written like a play, all in dialogue and stage directions, it is based on Ruskin's own series of lectures given to the pupils of Winnington Girls' School in Cheshire, and the crystal is almost certainly based on Ruskin's own Rose-Fluor, one of two which he had donated to the Natural History Museum in 1850 (figs 2.1, 2.2).[2] Embedded in dull grey rock, the emergent pink crystal is an impressive and evocative specimen. But in fact the specimen on which Ruskin surely constructed his allegory is not pyramidal but octahedral. And unlike the eternal solidity suggested by the metaphor of the ancient pyramids, the mineral is extremely fragile, striated with incipient cleavages along the lines of which it would shatter if dropped. (The Lecturer demonstrates great trust in the young girls to allow them to handle such a rare and delicate object.)

That the great nineteenth-century art critic and social theorist wrote a book on 'the Elements of Crystallisation', as the subtitle explains, is not so surprising given that geology and mineralogy held a lifelong fascination for Ruskin. This is evident in some of his better-known works, such as *The Stones of Venice* and *Modern Painters*: in the former the 'stones' come to symbolise the humble and natural rudiments of architecture, while in the latter Ruskin repeatedly draws on

[1] John Ruskin, *Ethics of the Dust: Ten Lectures to Little Housewives on the Elements of Crystallisation* (London: Smith, Elder, 1866), 27-36.
[2] Ruskin, *Ethics*, vii.

crystal as a metaphor for truth in art and goes on to consider the geology of the Alps in regards to landscape painting and the moral and spiritual life of inhabitants.[3] In these midcentury works he famously outlined his defining aesthetic theories based in truth to nature in architecture and art, respectively. That Ruskin directed *Ethics of the Dust* to school-age girls, or 'little housewives' as the subtitle and dedication declare, *was* unusual at a time when rock formations and their study were by and large a masculine domain, and a rarefied one at that – mineral collections did not achieve the same kind of popularity in young ladies' boudoirs that, for example, ferns and seashells did.[4] However, given the special place young girls held in Ruskin's work and life, this too is not completely out of place. Ruskin's relationships with girls, both real and imagined, have opened him up to accusations of sexual deviance, specifically paedophilia,[5] and the rapport he envisions between the Old Lecturer – Ruskin's thinly veiled stand-in – and the little girls, whom the former bestows with nicknames such as 'Egypt' and 'Mousie', is accordingly uncomfortable.

And yet the girls are not just convenient or pretty recipients of the teachings on minerals: *they are integral to them*. Early in the text the Lecturer has the girls arrange themselves to emulate a crystalline structure; he notes that their crinolines function as the rough surface, or may be pinned in to form a polished crystal.[6] To him the girls are 'but a lovely group of rosy sugar-candy, arranged by atomic forces'.[7] Such images not only resonate with the Rose-Fluors in the Natural History Museum, their rare, delicate hue and glowing yet fragile surfaces, but also come to characterise the exquisite aestheticism of Ruskin's mineralogy overall. They beg the question: how did this effete science compare with or manifest in the museum which Ruskin entrusted with several of his finest specimens (in addition to the Couttet Rose-Fluors, he later donated the Edwardes

[3] Ruskin, *The Stones of Venice*, vols 1-3 (London: Smith, Elder and Co., 1851-53) and *Modern Painters: Their Superiority in the Art of Landscape Painting*, vol. 1 (London: Smith, Elder and Co., 1843), 56, 96, and vol. 4 (of 5) (London: Smith, Elder and Co., 1856), 89-316.
[4] See Charles Kingsley on 'pteridomania' and young women's collections. Kingsley, *Glaucus; Or, the Wonders of the Shore*, 3rd edn (Cambridge: MacMillan and Co., 1856), 3-4. Also see Lynn Barber, *The Heyday of Natural History, 1820-70* (London: Jonathan Cape, 1980), 37.
[5] Ruskin's biographer Tim Hilton writes plainly that 'he was a paedophile'. Hilton, *Ruskin: The Early Years*, new edn (New Haven: Yale University Press, 2000), 253-54. Others have performed subtler investigations of his desires in relation to his work, as will be considered later in this chapter.
[6] Ruskin, *Ethics*, 43.
[7] Ruskin, *Ethics*, 21.

Ruby and the Colenso Diamond)[8] and for which he went on to curate an exhibition of crystals? To answer this, I will consider the division of the Mineral Gallery from the geological collection and the implicit significance of discrete fragments of inorganic matter for structural analysis, isolated from the grand narratives of the earth's movements recorded in the fossils of the Geology Gallery. The rich metaphors and overwhelmingly feminised personifications minerals perform in Ruskin's work and their relationship to Ruskin's own theatrical and unstable identity – queer or postmodern, as several writers have claimed[9] – present alternative narratives resulting in a uniquely gendered order in the Mineral Gallery.

An Effete Science

Today it may seem confusing that the departments of mineralogy and geology at the Natural History Museum were separate, but in the later nineteenth-century context, these were distinct – if closely related – fields. In the museum this division entailed a separation of the organic and the inorganic: the geological collections, which occupied the entire ground floor of the east wing, were filled with fossils and skeletons of extinct mammals, reptiles, birds, fishes, invertebrates and plants, while the long Mineral Gallery just overhead held rocks, crystals, metals and meteorites (fig. 2.3). This division reflected the status and significance of the two disciplines. From early in the century, geology was the most central and influential of the natural sciences. By demonstrating the tremendous age of the earth through the study of its layered sediments and their formations through slow, vast movements, Charles Lyell's 1830-1833 *Principles of Geology* among others had fostered a sense of deep, stratified time and an expansive, continuous narrative that was not only profoundly influential, but also threatening, in particular to religious beliefs (fig. 2.4).[10]

To animate such monumental theories, and perhaps to foil their destabilising implications, geologists themselves took on theatrical methods and

[8] See E. Ray Lankester, *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 1. (London: British Museum (Natural History), 1904), 381.
[9] See, for example, Sharon Aronofsky Weltman, *Performing the Victorian: John Ruskin and Identity in Theater, Science, and Education* (Columbus: Ohio State University Press, 2007), 3.
[10] Charles Lyell, *Principles of Geology*, 3 vols (London: John Murray, 1830-1833).

personae.[11] Exemplifying this tendency was William Buckland, Lyell's teacher, whose lectures at Oxford in the first half of the century employed visual aids and theatrics and even sometimes took to the outdoors.[12] Buckland would bring in entire skeletons and restorations of living animals and would impersonate extinct animals himself.[13] Emerging out of Regency show culture, his theatrical lectures demonstrated an attempt to validate geology as an academic discipline through popularisation, and firmly adhered to the ideology of natural theology.[14] Geology ultimately provided a model for the formation of scientific disciplines.[15] Its name only established following the formation of the Geological Society in 1807, the emergent discipline, especially as developed by Lyell, marked a fundamental shift in scientific thinking towards the 'interest in nature defined as prehuman and nonrational'.[16] By narrativising such unfathomable concepts and time spans, early figures such as Buckland made them seem more containable, and thus humanised them. In turn, such figures became associated with adventure and vigour – life at its fullest. The Geology Gallery in the Natural History Museum suggests the diversity and grandiosity of this enterprise, as it was filled with impressive freestanding skulls and skeletons, as well as various remains and fossils in an assortment of display cases (fig. 2.5). Although the animals represented are extinct, they nevertheless evoke a former order of life on earth as well as hierarchies within, forming a stratification within the exhibition itself.

While minerals formed an integral component of geological discovery, their display in the Museum was subdued in contrast and elicited less excitement. One newspaper writer commented on the Geology Gallery in 1881, 'There are few objects so exciting to the imagination as these colossal fragments of antediluvian life', but continued, 'It may perhaps be admitted that, except to

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[11] Adelene Buckland, 'Shows of London: Rocks' seminar, Courtauld Institute (9 Mar. 2011). Adelene Buckland elaborates similar ideas in *Novel Science: Fiction and the Geological Imagination* (Chicago: University of Chicago Press, 2011).

[12] See Ralph O'Connor, *The Earth on Show: Fossils and the Poetics of Popular Science, 1802-1856* (Chicago: University of Chicago Press, 2007), 71-116; and David Knight, 'Introduction', in William Buckland, *Geology and Mineralogy: Considered with Reference to Natural Theology*, vol. 1 (1836), ed. David Knight (London: Routledge, 2003), vii.

[13] O'Connor, 77, 80.

[14] O'Connor, 71-3. When Buckland became reader of mineralogy at Oxford in 1813, there were no sciences being taught and lectures were optional. Knight, vii. In his *Geology and Mineralogy*, Buckland argued for fossil remains, mineralogical composition and geographical diversity as 'Proofs of Design', all pointing to God as designer. William Buckland, *passim*.

[15] Noah Heringman, *Romantic Rocks, Aesthetic Geology* (Ithaca: Cornell University Press, 2004), 7.

[16] Heringman, 26, 7. 'Mineralogy' was commonly used to describe geology prior to the late eighteenth century. Rachel Laudan, *From Mineralogy to Geology: The Foundations of a Science, 1650-1830* (University of Chicago Press, 1987), 1 n. 1.

specialists, a collection of mineralogical specimens is not particularly exhilarating.'[17] Nevertheless, the Museum's mineral collection was a point of pride, developing greatly throughout the mid to late nineteenth century with major donations and acquisitions: by 1857 it warranted its own department.[18] At this time Mervyn Herbert Nevil Story-Maskelyne, professor of mineralogy at Oxford, was appointed keeper of mineralogy – for over forty years the collection had largely been neglected – and under his keepership great developments were made in arranging and labelling specimens in newly fitted cabinets.[19] The collection was the first to be transported to the as yet unopened Museum in June 1880, only a month after Lazarus Fletcher was promoted as the new keeper of mineralogy; by the time it arrived at the new site in South Kensington it was unrivalled in completeness and quality.[20]

In comparison with the jumbled and variegated Geology Gallery, the 'spacious' Mineral Gallery was orderly and uniform.[21] In a way, the Gallery's neatness and horizontal orientation echoes the practice of the mineralogist. The reasoned, non-hierarchical displays of rocks and crystals are indicative of a science more concerned with microcosmic forms than grand narratives. Henry Sowerby, author of the 1850 text *Popular Mineralogy*, explained this difference from the geologist:

> [W]hile the geologist explores the deep and dismal caverns formed in the crust of the earth, and disentombs therefrom the fossilized remains of gigantic beings, who, perhaps, sought in them a refuge from the overwhelming flood; and whilst he examines such portions of the stratified or unstratified rocks as have been laid open to view by the ravages of the elements during thousands of years, and builds thereon, as the result of his investigations, theories almost as magnificent and extensive as the convulsions of nature on which these theories are based; the mineralogist, less aspiring in his attempts, but perhaps for that very reason more certain to arrive at just conclusions, contents himself with analyzing and experimenting upon the substances which enter into the composition of those rocks, or which in veins traverse them.[22]

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[17] *The Saturday Review* (23 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[18] Lazarus Fletcher, *A Guide to the Mineral Gallery of the British Museum (Natural History) with an Introduction to the Study of Minerals* (London: British Museum (Natural History), 1884), 10.
[19] The last keeper of mineralogy, Charles Konig, had become keeper of the department of natural history in 1813, and after his death in 1851 there had been no mineralogist on staff. Lankester, 346.
[20] Lankester, 349; Fletcher, 11.
[21] 'Natural History Museum'. *Daily Chronicle* (28 Dec. 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[22] Henry Sowerby, *Popular Mineralogy; Comprising a Familiar Account of Minerals and Their Uses* (London: Reeve and Benham, 1850), 6-7.

The resulting image is of an armchair science or closet field whose practitioners are concerned with the structure and forms of discrete fragments of inorganic materials, and their beauty. Sowerby reasoned that despite the recent craze for natural history, minerals had not received the popularity they deserved, due to '*the absence of that life and the power of motion*'.[23] Nevertheless, he wrote,

> [N]ature, as if to compensate for these deficiencies, has bestowed upon them with a lavish hand all that can render them attractive to the eye or suggestive to the reflection; and has not only decked them in the most gorgeous tints, but has endowed them with so much gracefulness and diversity of form, that, in fact, their beauties are excelled by no other class of natural objects.[24]

Ruskin in the Natural History Museum

These beauties clearly attracted John Ruskin. Having begun his collection as a child by his account, compiling a 'Mineralogical Dictionary' at the age of twelve, he wrote extensively on the subject in his personal catalogues, correspondences and published writings.[25] Much like his theory of art, in which he argues that truth and beauty can only be arrived at in specific rather than generalised forms,[26] Ruskin's study of minerals is based on minute empirical observation and corresponding allegory and myth. Although chemical composition was an important component of modern mineralogy, Ruskin followed the example of early nineteenth-century mineralogists Robert Jameson and Friedrich Mohs, whose systems were 'totally independent of any aid from Chemistry'.[27] Jameson, who adopted his system from Mohs, grouped minerals 'according to their forms, lustre, streak, hardness, and specific gravity' in harmony with what he called the *Natural History Method*, common to zoology and botany alike, and in his words 'the only one by which minerals could be scientifically arranged, and the species accurately determined'.[28]

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[23] Sowerby, 3. Emphasis in original.
[24] Sowerby, 3-4.
[25] Ruskin, *Deucalion: Collected Studies of the Lapse of Waves, and Life of Stones*, vol. 1 (Sunnyside, UK: George Allen, 1879), 3-4.
[26] Ruskin, *Modern Painters*, vol. 1, 71.
[27] Robert Jameson, *A System of Mineralogy, in Which Minerals are Arranged According to Their Natural History Method*, 3rd edn (Edinburgh: Archibald Constable, 1820), iii. For more on Jameson's influence on Ruskin see Marcia Pointon, *Brilliant Effects: A Cultural History of Gemstones and Jewellery* (New Haven: Yale University Press, 2009), 317.
[28] Jameson, iii.

Accordingly, Ruskin focussed primarily on the physical and visible structure of minerals, as evident in his meticulous descriptive cataloguing.[29] In a letter to Lazarus Fletcher, keeper of mineralogy, Ruskin dismissed Henry Roscoe's *Chemistry* (1876) and its claim that natural and artificial precious stones are indistinguishable as 'foolish'.[30] He disagreed with Fletcher's classing hyalite with opal for 'chemical reasons': 'You might as well class a man with a wolf because they were both meat'.[31] As in his art criticism which dismissed imitation in painting as deceptive and facile, he argued against what he viewed as chemistry's insubstantial, ultimately synthetic relationships.[32] On painting he wrote, 'All falsehood must be a blot as well as a sin, an injury as well a deception.'[33] This conviction was furthermore symptomatic of Ruskin's natural historical beliefs, in particular his rejection of Darwinian evolution for reducing the beauty of nature with its spiritual and moral implications to mundane scientific principles.[34]

Such seemingly reactionary beliefs may be presumed outdated according to scientific advances taking place within the Natural History Museum: under Story-Maskelyne the British Museum's collections had been rearranged according to Gustav Rose's crystallo-chemical system and by 1867 it had provided an external chemical lab for crystal analysis.[35] Yet in many ways the Museum's displays and literature fostered a similar vision of the study to Ruskin's, one that was in keeping with nineteenth-century mineralogical texts. The Museum emphasised the material of its specimens in isolation from any earth narratives behind their formations, bestowing a sense of timelessness onto its subject matter.

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[29] Ruskin, *Catalogue of Minerals*, vols 1-3, NHM Archives.
[30] Ruskin, letter to Lazarus Fletcher (Coniston, 13 Oct. 1885), U DP/8/39, Hull History Centre Archives.
[31] Ruskin, letter to Lazarus Fletcher (Brantwood, 24 July 1884), U DP/8/33, Hull History Centre Archives.
[32] Ruskin, *Modern Painters*, vol. 1, 23. Esther Leslie writes that with the production of synthetic colour and materials (including jewels) chemistry at the turn of the nineteenth century 'began a war on physical reality, outbidding nature's own productions'. She connects the history of this war – spanning over two hundred years – to the 'magic' of commodity fetishism as defined by Marx, in which products appear to be purchased almost magically. Furthermore, chemistry contributed to the horrendous conditions of textile manufacture for workers, who were regularly poisoned by the by-products of the chemical industry. Leslie, *Synthetic Worlds: Nature, Art and the Chemical Industry* (Harmondsworth, UK: Reaktion, 2005), 9, 15, 79-80. These sentiments resonate with Ruskin's socialist ideals.
[33] Ruskin, *Modern Painters*, vol. 1, 57.
[34] See Phillip Prodger, 'Ugly Disagreements: Darwin and Ruskin Discuss Sex and Beauty', in Barbara Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 40-58; and Jonathan Smith *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006), 26-27.
[35] Lankester, 348.

Fletcher's guide to the Mineral Gallery stated: 'the Mineralogist deals, not with the arrangement past or present, but with the nature of the matter itself'.[36] That this nature largely concerned visible form is evident in detailed taxonomies of such 'optical characters' as degrees of transparency, different kinds of lustre, streak and in particular colour.[37] The guide set out a detailed 'Scale of Colours', including exacting distinctions, for example between the 'cochineal-red' of crystallised cinnabar, 'rose-red' of rose-quartz, 'crimson-red' of ruby and 'peach blossom-red' of lepidolite. It considered metallic and non-metallic colours as well as iridescence and opalescence; it defined and distinguished the 'suite' of colours in a single mineral such as fluorite from the 'play' of colours in precious opal and the 'change' of colours found in labradorite.[38]

Ruskin expanded on such colour analyses in his own work for the Museum, a small exhibition of Native Silica he arranged in the round room known as the 'Pavilion' at the end of the main Mineral Gallery in 1884. In the accompanying catalogue, he pontificated on the various types of iridescence in opal, moonstone and labradorite, for example comparing a 'truly *opalescent*' hemisphere of quartz formed by radiating crystals to the 'merely splendent' effects found in another specimen.[39] He elaborates:

> The colours of opal are always of a subdued tone, and of perfect purity, – no mixture of hue ever takes place which dulls or corrupts; but in a fissured quartz the colours are unsubdued, being only those obtainable in the common spectrum of the prism; and the colours are often blended so as to detract from each other's purity, and give coppery or bronzed combinations of red and green, which would never be allowed by a good painter; while the blue chiefly reflected by quartz is only that which is produced by the pigments formed of prussiate of iron, the blues reflected by opal are, on the contrary, always those produced by smalt and ultramarine.[40]

Ruskin's assessment of subdued colours, comparison of crystal formations to painterly skill and minute evaluations of reflected 'pigments' again indicate a clear continuum between his mineral theory and his art theory – minerals were after all the raw materials of painting. Such passages recall Ruskin's praise for

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[36] Fletcher, 17.
[37] Fletcher, 61-66.
[38] Fletcher, 63.
[39] Ruskin, *Catalogue of a Series of Specimens in the British Museum (Natural History) Illustrative of the More Common Forms of Native Silica* (Sunnyside, UK: George Allen, 1884), 26. Emphasis in original.
[40] Ruskin, *Native Silica*, 27.

J.M.W. Turner's 'truthful principle of delicate and subdued colour' in *Modern Painters*:

> In one deep reflection of his distant sea, we catch a trace of the purest blue, but all the rest is palpitating with a varied and delicate gradation of harmonized tint, which indeed looks vivid blue as a mass, but is only so by opposition.[41]

Correspondingly, Ruskin later expressed the special significance rich blue held in nature when he granted sapphire 'Heaven's own colour'.[42] Rather than crassly attempting to directly replicate such vividness, Ruskin believed that Turner's modified colouration invoked 'essential truth', which in turn imbued the painter's sea with 'fathomless depths of crystal mystery'.[43]

Typical of the paradoxes that defined his aesthetic theory, Ruskin nevertheless denigrated colour as unstable, 'mean and feeble', ultimately secondary to form, 'little more than a visible melody'.[44] This sentiment followed the traditional art historical relegation of colour to line, or painting to drawing. Jacqueline Lichtenstein has demonstrated how the Platonic primacy of the idea embodied by the latter has been contrasted against the former's materialism, hence colour has been maligned as indecent, cosmetic and libertine for its 'immediacy of seduction'.[45] Contemporary to Ruskin, the French art critic Charles Blanc exclaimed that for these reasons, 'drawing is the masculine side of art, colour the feminine'.[46] Allowing for the importance of colour in art, Blanc employs the example of 'the expression of a young girl, that shade of trouble or sadness so well expressed by the pallor of the brow, or the emotion of modesty that makes her blush'.[47] However, he ultimately associates colour with decadence, deriding the 'mysterious promiscuity' of the rainbow and generally associating colourfulness with the 'lower strata of nature'.[48] Accordingly, due to its sensual, superficial, inessential character, David Batchelor ascertains that colour embodies

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[41] Ruskin, *Modern Painters*, vol. 1, 132.
[42] Ruskin, 'Iris of the Earth', in *Deucalion*, 112.
[43] Ruskin, *Modern Painters*, vol. 1, 109, 96.
[44] Ruskin, *Modern Painters*, vol. 1, 79-80, 83, 139.
[45] Jacqueline Lichtenstein, *The Eloquence of Color: Rhetoric and Painting in the French Classical Age*, trans. Emily McVarish (Berkeley: University of California Press, 1993), 3-4, 190.
[46] Charles Blanc, *The Grammar of Painting and Engraving* (1867), trans. Kate Newell Doggett (New York: Hurd and Houghton, 1874), 145.
[47] Blanc, 147.
[48] Blanc, 169. On the dialectic of colour in painting as deemed simultaneously inherent to feminine virtue and to feminine artificiality, see Tamar Garb, *The Painted Face: Portraits of Women in France 1814-1914* (New Haven: Yale University Press, 2007), 1-17.

the other: that which is feminine, oriental, primitive, infantile, vulgar or queer.[49] Colour is a token of the world of the senses – and of desire.[50]

But Ruskin also saw colour as a fundamental aspect of vision – indicative of depth and light – and of thought.[51] While he deemed it secondary within the artificial realm of representation, he believed as a quality of minerals – which comprised pure, unadulterated colour, in contrast to painting's 'pure illusory effect of an artifice'[52] – it was integral and imparted important truths. These truths and their inherent beauty formed a central aspect of what was being communicated to the museum-going public, according to Ruskin, and he felt should be emphasised at all costs. In his catalogue for the exhibition of Native Silica he wrote:

> In a museum intended primarily for the instruction of the general public, it is not of the least consequence whether silicates come after carbonates or oxides after sulphites: but it is of vital and supreme importance that specimens whose beauty is in their colour should be put in good light, and specimens whose structure is minute, where they can be seen with distinctness.[53]

Ruskin sought to achieve this objective of knowing through sight and appreciation of beauty through his curation of the exhibition. He explains how one specimen, 'a large fragment of rock-crystal with vermicular chlorite dispersed throughout and some small plates of haematite' is positioned in its case so that it 'permits the

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[49] David Batchelor, *Chromophobia* (London: Reaktion, 2000), 22-23. Compounding the unstable and feminine associations, Max Nordau associated the skewed perception of colour with hysteria and neurasthenia. Max Nordau, *Degeneration* (1892), trans. George L. Mosse (Lincoln, NE: University of Nebraska Press, 1993), in David Batchelor, ed., *Colour* (London: Whitechapel and MIT Press, 2008), 42-44. On colour and Victorian representations of otherness, see Jessica Durgan, 'Color, the Visual Arts, and Representations of Otherness in the Victorian Novel', PhD diss. (Texas A&M University, 2012).

[50] Batchelor, *Chromophobia*, 36-37.

[51] Ruskin, *The Elements of Drawing* (London: Smith, Elder and Co., 1857), 5. Ruskin wrote that 'every pleasure connected with art has in it some reference to the intellect. The mere sensual pleasure of the eye, received from the most brilliant piece of colouring, is as nothing to that which it receives from a crystal prism, except as it depends on our perception of a certain meaning and intended arrangement of colour, which has been the subject of intellect. Nay, the term idea, according to Locke's definition of it, will extend even to the sensual impressions themselves as far as they are "things which the mind occupies itself about in thinking", that is, not as they are felt by the eye only, but as they are received by the mind through the eye'. Ruskin, *Modern Painters*, vol. 1, 11-12.

[52] Lichtenstein, 43.

[53] Ruskin, *Native Silica*, 29. Correspondingly, Ruskin wrote to Fletcher in preparing the catalogue, 'I hope you will be able to pass my unscientific analysis of Chlorite – of which assuredly vulgar people had better learn something, anyhow, than nothing, scientifically. No one will for a moment think the Museum answerable for it'. Ruskin, letter to Lazarus Fletcher (Coniston, 3 Aug. 1884), U DP/8/34, Hull History Centre Archives.

spectator, standing between it and the window, to see vivid reflection its splendid iridescence'.[54]

The displays of the main gallery likewise acknowledged the layperson's distinctive needs from those of the specialist by including information 'interesting or intelligible only to the student' in a smaller font in the wall text in order to 'not perplex the general public'.[55] However, the guide to the Mineral Gallery nevertheless emphasised the importance of understanding aspects of minerals beyond the visual, commenting that in comparison with the familiarity of forms in the zoological and botany departments, the Mineral Gallery presented more of a challenge to the (presumedly male) gallery visitor:

> [W]hen he comes to the Minerals, and finds that with life and organised structure has apparently disappeared everything which gives separateness to the individual, and that hardly any distinctive character seems to be left save colour, he becomes impressed with the idea that, while their beauty is evident, minerals must fail of being discriminated unless we penetrate beyond their superficial aspects.[56]

In the Mineral Gallery and contemporary mineralogy, as in the modern cultural criticism considered here, we find repeated tensions voiced between the superficial and the truly meaningful. For Ruskin, as will become evident, this contradiction is negated by his conviction that in their very appearance and form minerals contain deeply meaningful truths. His involvement in the Museum thus demonstrates how its natural history specimens were mobilised to engage in both aesthetic and moral discourses.

Mineral Morals

Ruskin's detailed descriptions of mineral characters bordered on the poetic. Nowhere was this more evident than in his catalogue for the exhibit of Native Silica. He writes of the 'delicate bloom of the purer varieties of opaque-surfaced chalcedony', '[e]xquisitely delicate amethystine inlaid agate' and '[d]ove-coloured flamboyant chalcedony.'[57] In one especially evocative passage he describes

[54] Ruskin, *Native Silica*, 26.
[55] Fletcher, 5.
[56] Fletcher, 5.
[57] Ruskin, *Native Silica*, 9, 17, 15.

> [w]hite jasper, passing into beautifully banded brick-coloured jasper; exquisitely spotted … with dendritic oxide of manganese, of microscopic delicacy; the mass, here and there, retreating to form cells filled with bluish chalcedony, transitional to quartz, while at the outside it is in some parts brecciate to extreme minuteness.[58]

Such commentary invokes a sense of desire, as well as formal judgement. Ruskin continually evaluates his specimens, sometimes expressing distaste, as in the case of one 'ugly' example of dull red and green banded jasper, but frequently conveying awe and delight, with adjectives such as 'beautiful', 'very pretty' and superb', or for example in his response to a shattered and re-cemented chalcedony: 'The most wonderful and inexplicable piece I ever saw'.[59]

For Ruskin, however, these remarkable physical phenomena were not limited to visual pleasure, but much like artworks, harboured important moral and spiritual lessons, for example those elucidated in *The Ethics of the Dust*. One lecture-chapter on the 'Virtue, or Courage of crystals' also addresses their 'faults'.[60] Wholly personifying minerals, the Lecturer tells the story of one 'ignoble and dissolute' specimen of quartz, whose width is inconsistent and malformed throughout:

> Opaque, rough-surfaced, jagged on the edge, distorted in the spine, it exhibits a quite human image of decrepitude and dishonour; but the worst of all the signs of its decay and helplessness, is that half-way up, a parasite crystal, smaller, but just as sickly, has rooted itself in the side of the larger one, eating out a cavity round its root, and then growing backwards, or downwards, contrary to the direction of the main crystal.[61]

The Lecturer notes that this type of impurity exists not within the substance of the crystal but in its 'will', or lack thereof. In Ruskin's world stones can be 'good' or 'wicked', and this is either borne upon by the circumstances in which they were formed – or 'brought up' – or through sheer strength of spirit.[62] Furthermore, the language of descrepitude, distortion, decay, sickliness and deviation echoes contemporary rhetoric concerning degeneration that was becoming increasingly prevalent since mid-century.[63] In contrast to the quartz, he commends 'a rock-

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[58] Ruskin, *Native Silica*, 4.
[59] Ruskin, *Native Silica*, 13, 4, 11-12.
[60] Ruskin, *Ethics*, 78.
[61] Ruskin, *Ethics*, 86-87.
[62] Ruskin, *Ethics*, 110-11.
[63] For example, in Robert Knox's *The Races of Men* (1850), Arthur de Gobineau's *Essay on The Inequality of the Human Races* (1855), Benedict Morel's *Treatise on Physical and Moral Degeneration* (1857), and later Cesare Lombroso's *L'Uomo delinquente* (1876) (on the degeneracy of the criminal), the Natural History Museum's future director E. Ray Lankester's *Degeneration: A Chapter in Darwinism* (1880) (on degeneration within evolution) and Max Nordau's *Degeneration* (1892) (on degeneracy within art and literature).

crystal of the purest race and finest temper' who overcomes being born into a 'bad neighbourhood' through 'his' determination.[64]

This anthropomorphism is typical of Victorian cultural assessments of nature; examples abound in material concerning animals (particularly post-Darwin), and even plants.[65] They signal reaction against scientific findings that inferred that humans' place within nature was not unique as well as a sublimated response to imperial expansion. Harriet Ritvo writes, 'Animals were uniquely suitable subjects for a rhetoric that both celebrated human power and extended its sway, especially because they concealed this theme at the same time that they expressed it.'[66] She claims that this explains animals' ironic ubiquity within the cultural imagination of a society that predominantly exploited them. However, the discourse of power inherent within anthropomorphism extends beyond animal life to all aspects of the natural world, including inanimate forms such as rocks and crystals. As other not only to the human, but also to the animal, possessing an inorganic, alien physicality, minerals possess their own unique potential for personification.[67]

As seen in the above examples, in which purity of form unites crystalline virtue while impurity exists in the lack of will, in *The Ethics of the Dust* minerals enact a system of morality. The dust of the title, like *The Stones of Venice*, refers to the most rudimentary of materials from which lessons may be gained. As such it may be deemed spiritually and materially pure; and yet as well as fine particles of earth, dust comprises waste and thus its classification oscillates towards impurity. In the nineteenth century, stigma developed against dust, as it was identified as a by-product of industrialisation and poverty and a perpetrator of disease; 'suspicion of dust' grew strongest towards the end of the century.[68] However, as anthropologist Mary Douglas has famously delineated, the fundamental definition of dirt preceding germ theory was 'matter out of place':

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[64] Ruskin, *Ethics*, 111.
[65] See Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, MA: Harvard University Press, 1987), 3-6; Gillian Beer, '"The Face of Nature": Anthropomorphic Elements in the Language of *The Origin of Species*', in Ludmilla Jordanova, ed., *Languages of Nature: Critical Essays on Science and Literature*, (London: Free Association, 1986), 212-43; and Robin Veder, 'Mother-Love for Plant-Children: Sentimental Pastoralism and Nineteenth-Century Parlour Gardening', *Australasian Journal of American Studies*, 26.2 (Dec. 2007), 20-34.
[66] Ritvo, 6.
[67] Heringman, 56.
[68] See Carolyn Steedman, *Dust* (Manchester: Manchester University Press, 2001), 20-21, 118-19.

'Dirt is the by-product of a systematic ordering and classification of matter.'[69] Philosopher Julia Kristeva expands such unclassified matter to her theory of the abject, whose breakdown of boundaries between subject and object is ultimately tied to the maternal body, thus explicitly linking dirt and the feminine.[70]

Just as animals both wild and domestic regularly symbolised gender, race and class structures in relation to morality in Victorian literature,[71] Ruskin's minerals – whether condemned as feeble and lacking will or heralded for their purity – become emblematic of nineteenth-century attitudes toward social otherness. Racist overtones are blatant in examples such as Ruskin's praise of tourmaline for being 'one of the prettiest of the very few pretty black things in the world',[72] while the nationalistic implications of the exhibition of Native Silica, whose chief defining classification is its national boundaries, are clear. The parables in *Ethics* and their rhetoric of purity are intended to guide and shape the young minds of the girls – notably, English girls in a school 'far in the country'.[73] The Lecturer constantly expounds his lessons through teasing and shaming the girls: throughout he playfully chastises them for their impatience, disbelief, obduracy, disorderliness and similar 'faults', warning them that the virtuous crystals may make them ashamed of themselves.[74] It is in this regard that their gender becomes integral to the purpose of the text; he claims that the 'mathematical part of crystallography is quite beyond girls' strength; but these questions of the various tempers and manners of crystals are not only comprehensible by you, but full of the most curious teaching for you'.[75]

In the Victorian context, young girls are the ideal recipients for the lessons of moral purity the stones have to offer. Espousing crystals' stern 'code of morals', the Lecturer claims, '[T]heir essential virtues are but two; - the first is to be pure, and the second to be well shaped.'[76] Later in a teasing repartee, he lists the two essential virtues of girls, the first of which is dancing and the second of

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[69] Mary Douglas, *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* (1966) (London: Routledge, 2002), 44.
[70] Julia Kristeva, *Powers of Horror: An Essay on Abjection*, trans. Leon S. Roudiez (New York: Columbia University Press, 1982), 2.
[71] Deborah Denenholz Morse and Martin Danahay, 'Introduction', in Morse and Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 8-9.
[72] Ruskin, *Ethics*, 179.
[73] Ruskin, *Ethics*, vii.
[74] Ruskin, *Ethics*, 78.
[75] Ruskin, *Ethics*, 78.
[76] Ruskin, *Ethics*, 83.

which is dressing. He quips, not altogether flippantly, 'Girls ought to like to be seen.'[77] He continues:

> Girls should be like daisies; nice and white, with an edge of red, if you look close; making the ground bright wherever they are; knowing simply and quietly that they do it, and are meant to do it, and that it would be very wrong if they didn't do it.[78]

While such platitudes are typical of contemporary sentiment concerning femininity and girlhood, they are notable in echoing the importance Ruskin places on looking at stones, which is so intense that he even endows minerals with a similar level of agency in being seen. Unlike the common comparison of young girls to flowers, the analogies with minerals are unexpected.[79] And in contrast with discourse that saw female sexuality as animal,[80] Ruskin put forth female chastity as mineral.

Rather than merely anthropomorphising stones, Ruskin mineralises girls. Throughout, the Lecturer instructs the girls to play at crystals in order to fully understand their properties: 'You shall make diamonds of yourselves, and rubies of yourselves, and emeralds', he commands, 'and you shall make Derbyshire spar of yourselves, and Iceland spar, and gold, and silver.'[81] With the grand arrangements into which the Lecturer has the girls form themselves, he asserts control not only over their moral worlds, but also their physical realities. The girls are literally transformed into crystalline structures, in the process reifying the moral lessons of minerals. In a letter from a former pupil to Ruskin, the crystallisation of the little girls' world in *Ethics* is shown to mimic his teaching of the real girls of Winnington School. Agatha Tyndale's lengthy acknowledgement of some agate specimens Ruskin donated includes a description of the status of the school's mineral collection, which is so thorough so as to almost completely illustrate *Ethics of the Dust*. She tells him, 'We have a new dance which we call

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[77] Ruskin, *Ethics*, 130-32.
[78] Ruskin, *Ethics*, 132-33.
[79] In *Proserpina*, Ruskin presented a taxonomy of flowers based on girls' names, personifying flowers with the pronouns 'she' and 'her', and comparing their characters with the virtues of mythological and Shakespearian heroines. Ruskin, *Proserpina: Studies of Wayside Flowers*, vol. 2 (London: George Allen, 1882), 43-8. Also see Lindsay Smith, 'The Foxglove and the Rose: Ruskin's Involute of Childhood', in eds Dinah Birch and Francis O'Gorman, *Ruskin and Gender* (New York: Palgrave, 2002), 47-63. Girls in Victorian Britain were associated with flowers in portraits, Valentines and advertisements as well as in the darker world of the 'flower girl' street merchant of London markets, who was linked to prostitution. See Henry Mayhew, *London Labour and the London Poor*, vol. 1 (London: G. Woodfall and Son, 1851), 130-37. This morally dubious figure was immortalised in George Bernard Shaw's 1912 play *Pygmalion*.
[80] See Bram Dijkstra, *Idols of Perversity: Fantasies of Feminine Evil in Fin-de-siècle Culture* (New York: Oxford University Press, 1986), 160.
[81] Ruskin, *Ethics*, 62.

Kaleidoscope because we had no word to mean Crystallizing, – and we are neither bright nor transparent enough, even in tarlatan frocks, to call ourselves crystals.'[82] Her statement echoes Ruskin's art critical conviction that compared with Nature, representation is always 'dead and lifeless beside her living colour'.[83] Tyndale demonstrates that through their mineralogical enactments, she and the other girls have internalised the crystals' contradictory lesson of modesty regardless of the desire to be seen.

Tactile Erotics and Delicious Physics

Notwithstanding the emphasis on looking and being looked at, Ruskin's insistence on this type of embodied mineralogical practice demonstrates that for him the truths contained within minerals are not to be ascertained through appearance alone. This sentiment echoed the Natural History Museum's insistence that 'we penetrate beyond their superficial aspects'. In Ruskin's writing crystals become multisensory objects, whose tactile qualities are equally fundamental to their understanding as are their visual qualities, and which are best described through comparison to all manners of foodstuff. The importance of touch arises again and again in Ruskin's mineralogy, from the pyramid-like Rose-Fluor, which nearly pierces the Lecturer's hand when he awakens from his parabolic dream and which the girls must hold to fully comprehend, to the girls' demonstration of their curiosity for knowledge through the act of touch: nine-year-old Florrie asks after the Lecturer's specimen embedded with shiny, apparently grease-covered white beads, 'May I touch them?'.[84]

In *Ethics*, intimacy between the rocks and young girls frequently takes on erotic overtones. Through the voice of the Lecturer, Ruskin establishes these affinities through connections to various aspects of the young girl's person: her touch, body, dress and adornment. Holding a polished specimen of 'lovely compact limestone', the Lecturer instructs:

> [Y]ou may now pass your soft little fingers over the surface, without so much as feeling the place where a rock which all the hills of England

[82] Agatha Tyndale, letter to John Ruskin (Winnington Hall, Northwich 18 Dec. 1877), U DP/7/2, Hull History Centre Archives. Tarlatan is a 'thin, open-weave muslin fabric, used for stiffening ball dresses'. OED.
[83] Ruskin, *Modern Painters*, vol. 1, 119.
[84] Ruskin, *Ethics*, 14.

> might have sunk in the body of, and not a summit seen, was torn asunder through that whole thickness, as a thin dress is torn when you tread upon it.
> (*The audience examine the stone and touch it timidly; but the matter remains inconceivable to them.*)[85]

Like rough crinolines pinned-in and tarlatan frocks, such passages draw allusions between the materiality of crystal, flesh and fabric; these become integral to understanding the perplexing lessons of the stones and hence, inextricable. The desirous sensual slippages produce an uncomfortable sexual tension in *Ethics* between the purportedly benign Old Lecturer and the eager but naïve young girls.

Although the idiosyncrasy may appear peculiarly Ruskinian, tactility and other sensual experience form a recurring theme in contemporary mineralogy. Among the characters of minerals, the guide to the Mineral Gallery lists fracture, coarseness, fineness, hardness, gravity, malleability, unctuousness and even adhesiveness to the tongue.[86] While in his 1823 *Elementary Introduction to Mineralogy* William Phillips claims that touch is 'so limited in its application as to be of little service in distinguishing minerals' and that smell and taste are similarly unimportant, the Museum's guide listed various characters of smell (bituminous, sulphurous, garlic-like) and taste (astringent, sweetish astringent, saline, alkaline, cooling, bitter) alongside optical, structural and electrical characters for defining minerals.[87]

The senses' continued evocation in the language of mineralogy clearly inspired Ruskin's investigations. The 'rosy sugar candy' of the crystalline girls and tapioca-like consistency of specimens to which he entreats them are both evoked by the Couttet Rose-Fluors, with its warm pink translucent glow and contrasting opaque, seemingly bubbling stone encasing. Such minerals become at once familiar and delectable. In 'Of Ice-Cream', one of a series of essays on geology from his 1879 volume *Deucalion*, Ruskin demonstrates the 'wonderful phenomena of congelation, regelation, degelation, and gelation' of glaciers by sprinkling flour onto a model of mountains, like a 'Cyclopean miller and his men'.[88] Assessing the material's suitability, he writes:

> You might perhaps heap your Alp high with wheat, – not so high with sand, – nothing like so high with dough; and a very thin coating indeed

[85] Ruskin, *Ethics*, 187.
[86] Fletcher, 67.
[87] William Phillips, *An Elementary Introduction to Mineralogy* (1823), new edn with extensive alterations and additions by H.J. Brooke and W.H. Miller (London: Longman, Brown, Green, and Longmans, 1852), 75; Fletcher, 67.
[88] Ruskin, 'Of Ice-Cream', in *Deucalion*, 44, 49.

> would be the utmost possible result of any quantity whatever of showers of manna, if it had the consistence, as well as the taste, of wafers made with honey.[89]

Arguing against James Forbes's treatment of glacier movement as indicating an undiminishing substance, 'like treacle or tar', he recommends to his audience an experiment with a sugar lump and hot water in a teaspoon.[90] He confirms that the snow and glacier covering the Alps is 'one great accumulation of ice-cream', whose effects are similar to 'the melted sugar poured on the top of a bride-cake' though more consistent with frozen water than frozen syrup.[91] In 'Of Butter and Honey', he challenges John Tyndall's interchangeable use of the terms 'plastic' and 'viscous' by redefining them as aligned, respectively, with butter and honey.[92] It is notable that Ruskin employed these seemingly whimsical comparisons in his professional lectures on rock formations, and to defy established authorities in the science.

What results is a maelstrom of sensuality and shape-shifting in Ruskin's vision of crystallography, one in which the sugar-sweetness of little girls is compounded with the evocation of shimmering, tactile, potentially delicious crystals, such as the Rose-Fluors. Such analogies are not only employed for poetic effect, but are integral to Ruskin's conceptions of mineralogy; they in effect re-supplant the language of chemistry. As demonstrated in the Lecturer's exacting instructions for the girls' formations, Ruskin had great concern for crystalline geometry down to its finest particles, or 'bricks' as he explains them in the case of the Rose-Fluor. Although Ruskin is quick to admit his 'unscientific' understanding of certain minerals, he nevertheless took great interest in their defining structures, as in letters to Fletcher confirming the finer geometrical points of certain stones.[93] He exercises his understanding in the principles he expounds with both the crystallographic girl formations and the kitchen foods experiments. By creating crystal structures with girls, the Lecturer assumes a godlike status that parallels Ruskin's position sprinkling flour over the Jungfrau mountain range – fittingly enough – in 'Of Ice Cream'. Both scenarios illustrate

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[89] Ruskin, 'Of Ice-Cream', 49.
[90] Ruskin, 'Of Ice-Cream', 52-53.
[91] Ruskin, 'Of Ice-Cream', 54.
[92] Ruskin, 'Of Butter and Honey', in *Deucalion*, 84-96.
[93] See Ruskin, letter to Lazarus Fletcher (Laon, 14 Aug. 1882), U DP/8/6; Ruskin, letter to Lazarus Fletcher, (Brantwood, 1884), U DP/8/14; Ruskin, letter to Lazarus Fletcher, (Brantwood, 30 Mar. 1884), U DP/8/23, Hull History Centre Archives.

Ruskin's unusual association between atomic physics and fairy work – he referred to a collection of minerals he sent Fletcher as 'my four fairies'.[94]

Gendering Ruskin

The idiosyncrasies of Ruskin's mineralogy have been linked to his personal eccentricities, which came to bear on his exhibition in the Mineral Gallery. In his mineral work art historian Marcia Pointon finds a recurring theme of play, which she connects to his own childhood.[95] She argues that the importance of the tactile in Ruskin's 'mineral play' appeals to the important role touch has in young children's sensory experience of the world, a sensibility Ruskin asserted he maintained throughout his lifetime.[96] Having continued to live with his parents throughout his adulthood, until their respective deaths, Ruskin thereby fostered a sense of forever remaining a child. Nevertheless, while his mineral play, as recorded in his correspondences, catalogue compiling and publications such as *Ethics* and his curation in the Natural History Museum may invoke childlike and even feminine aspects of Ruskin's personality, Pointon also identifies game playing as common to paedophiles.[97] She writes, 'Ruskin was able to transform girls into minerals, thus realising in actuality as well as textually the analogic role that minerals played in his criteria of seduction.'[98] Literary scholar Catherine Robson likewise suggests that Ruskin's transfiguration of young girls into stone functions to distance the eroticism inherent in the former's 'world of soft and flexible moistness' from the latter's 'evocations of rock-like impenetrability and adamantine brilliance'.[99] Nevertheless, Robson argues that for Ruskin stone *is* arousing: '[T]his writer's besetting habit of viewing the beloved as both a hard and aesthetic object is not a defence against the erotic, but a component of it.' She writes, 'In Ruskin's particular case the pedophile and the petrophile are one.'[100]

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[94] Ruskin, letters to Lazarus Fletcher (Mar. 1884), U DP/8/22, and (Coniston, 20 Mar. 1884), U DP/8/24, Hull History Centre Archives.
[95] Pointon, 320.
[96] Pointon, 321; Catherine Robson, 'The Stones of Childhood: Ruskin's "Lost Jewels"', in Birch and O'Gorman, 31.
[97] Pointon, 325.
[98] Pointon, 324.
[99] Robson, *Men in Wonderland: The Lost Girlhood of the Victorian Gentleman* (Princeton: Princeton University Press, 2001), 122-23.
[100] Robson, *Men in Wonderland*, 123, 125.

My focus here, however, is not the details of Ruskin's private life and desires, but the stories that emerge from the objects: the Rose-Fluor and other specimens donated and exhibited by Ruskin in the Natural History Museum. Perhaps more instructive for this purpose – and knowable – than Ruskin's personal yearnings is the reception of his persona in contemporary discourse. Several literary scholars have argued that the multiplicity of Ruskin's persona – from his 'female role-playing' with baking ingredients in scientific experiments to his claims to childlikeness – marks him as a destabilising figure in the context of Victorian gender and sexual identity.[101] Dinah Birch and Francis O'Gorman trace Ruskin's unorthodox sexual persona to his childhood, which he himself feminises in his autobiography *Praeterita* and is imaged famously by James Northcote in a portrait at three years old wearing a dress (1822) (fig. 2.6).[102] As an adult he was (somewhat mistakenly) associated with the perceived effeminacy of the Aesthetic Movement, as well as that of Catholicism, which was shunned in the Victorian context for being associated with foppery and homosexuality and deemed a threat to English nationalism and masculinity.[103] O'Gorman argues that it is in fact Ruskin's early twentieth-century biographers' efforts to re-masculinise him that are responsible for his rejection by feminists as a symbol of Victorian patriarchy.[104]

Sharon Aronofsky Weltman similarly attempts feminist reclamation: 'Ruskin not only pushed social reform and aesthetic innovation – changing the course of art, literature, and politics for both the Victorians and the Moderns – but also presaged postmodern and poststructuralist conceptions of a fluid subjectivity.'[105] She further 'queers' Ruskin by arguing that his greatest sexual transgression lay not in his paedophilia, for which there is no conclusive evidence, as there is no evidence of Ruskin having sex at all – his marriage to Effie Gray was notoriously annulled unconsummated.[106] Thus it is rather his apparent

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[101] Birch and O'Gorman, 'Introduction', 3-4.
[102] Ruskin, *Praeterita*, 3 vols. (1885–89). Of course it should be noted that dressing young boys in 'feminine' apparel was common practice in this period. See Robson, *Men in Wonderland*, 4.
[103] See Birch and Owen'Gorman, 'Introduction', 9 n. 4.
[104] Francis O'Gorman, 'Manliness and the History of Ruskin in Love: Writing Ruskin's Masculinity from W.G. Collingwood to Kate Millett', in Birch and O'Gorman, 11.
[105] Weltman, 3. There is an interesting parallel between feminist reclamations of Ruskin and those discussed elsewhere in this thesis concerning Charles Darwin. Both cases often depend on reconsideration of the validity of the material employed by the nineteenth-century theorists – in Ruskin's case domesticity and in Darwin's, biology.
[106] The reasons for this have been subject to debate ever since, with speculations that on their wedding night Ruskin was repelled variously by Effie's pubic hair, menstruation or bodily odour. However, not only unconvincing, such theories at once overlook Effie's own agency within (and

asexuality and the contemporary and subsequent shock at this absence of desire that Weltman believes has disturbed Ruskin's identity performance.[107] Again, Weltman enlists Ruskin's 'feminized science' as subverting the Victorian scientific gender hierarchy which normatively feminises nature.[108] The ambiguous sexual identity Ruskin establishes through such unorthodox practice may be linked to Judith Butler's theory of gender performativity and its fluid implications for various 'morphological possibilities'.[109]

And yet the application of postmodern notions of theatricality to Victorian culture may be deemed anachronistic. In *Acting Naturally*, Lynn Voskuil claims that what recent theorists have labelled 'self-fashioning', Victorians understood as self-discovery: the performative Victorian self did not negate authenticity but involved 'a logic of self-construction that authenticates theatricality, that sees the self as spectacular to its very core'.[110] Ruskin exemplifies this tendency, in his self-mythologising biography and in the various roles he inhabits in his texts, not least of all the Old Lecturer in *The Ethics of the Dust*. While the theatrics of the play-lectures are subdued compared to those of Buckland's early nineteenth-century natural history, they are not atypical of a period when the theatre had emerged out of its disrepute of the earlier century, and many well-known writers turned their hands to drama.[111] In his art criticism, Ruskin admired the symbiotic relationship between the theatre and Pre-Raphaelite painting, whose dramatic

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outside of) the marriage as well as Ruskin's possible reasons for non-consummation beyond a lack of sexual desire. Robert Brownell has argued that as Effie Gray entered the marriage due to her father's troubled financial circumstances, it was in fact Ruskin's awareness of the lack of reciprocated love that prevented him from consummating the marriage, and that the annulment was a cause of his own orchestration. Brownell, *Marriage of Inconvenience* (London: Pallas Athene, 2013).

[107] Weltman, 113-15. This idea links to the discourse surrounding the sexuality of marine invertebrates: certain invertebrates' lack of sexual reproduction (labelled parthenogenesis, or 'virgin birth') was more disturbing to contemporary theorists and writers than, for example, others who reproduced through hermaphroditic means. See Patrick Geddes and J. Arthur Thomson, *The Evolution of Sex* (London: Walter Scott, 1889), 169.

[108] Weltman, 40.

[109] Birch and O'Gorman, 8. Judith Butler, *Bodies That Matter: On the Discursive Limits of 'Sex'* (1993), new edn (London: Routledge, 2011), 14.

[110] Lynn M. Voskuil, *Acting Naturally: Victorian Theatricality and Authenticity* (Charlottesville, VA: University of Virginia Press, 2004), 11. Voskuil's main argument, that naturalised performativity characterised Victorian culture is aimed against the traditionally held dichotomy between authenticity and theatricality in the Victorian era. For example, Nina Auerbach writes, 'Reverent Victorians shunned theatricality as the ultimate, deceitful mobility.' Auerbach, *Private Theatricals: The Lives of the Victorians* (Cambridge, MA: Harvard University Press, 1990), 4. However, Voskuil's reading seems to ignore Butler's central insistence that performativity is generally not a conscious process.

[111] Beth Palmer, 'Theatricality and Performance in Victorian Literature And Culture', *Victorian Network* 3.2 (winter 2011), 4.

narratives were typically suffused with moral significance.[112] For example, he was particularly enthusiastic about William Holman Hunt's *The Awakening Conscience* (1853) (fig. 2.7) – characteristically scrutinising the moral imperative within its details, he wrote that 'the very hem of the poor girl's dress, at which the painter has laboured so closely, thread by thread, has story in it, if we think how soon its pure whiteness may be soiled with dust and rain, her outcast feet failing in the street'.[113] One is reminded of the geologico-moral lesson of the thin dress torn when tread upon. Like anthropomorphism, theatricality, whether in performative self-construction, the evaluation of art or in the literal writing of plays, provided a sanctioned forum in which to explore otherwise problematic desires and relationships in the guise of imperative moral lessons.

However, in Ruskin's work, the most compelling 'morphological possibilities', certainly for the display in the Natural History Museum, are to be found in the objects themselves. While the shape-shifting scenes and cross-dressing characters of earlier Victorian theatre had largely fallen out of fashion by the second half of the century – for example, James Planché's extravaganza *Island of Jewels* (1849) featured the metamorphosis of a gilded palm tree into a group of fairies supporting a coronet of gemstones[114] – Ruskin can be seen to sublimate these bawdier theatrical devices in his natural history, in which girls become crystals become sugar, all for the purpose of higher moral learning. In his 'dizzyingly metamorphic vision of the world', Ruskin's transgressive performativity slips from his own identity to that of the objects of his mineral work and play, in which sugary-sweet girls become candied crystals.[115] Perhaps more than theatricality or performativity, this interplay between identities and objects in Ruskin resonates with Gilles Deleuze and Félix Guattari's theory of becoming. Fittingly, the philosophers employ a language of molecularity to describe an interchange of subjectivity that is set apart from resembling, imitating, playing, acting, appearing, being, equalling or producing.[116] In contrast with the molar – the site of mass, dominant formations – the molecular can be likened to

[112] Katherine Newey, 'Speaking Pictures: The Victorian Stage and Visual Culture', in Anselm Heinrich, Newey and Jeffrey Richards, eds, *Ruskin, the Theatre and Victorian Visual Culture* (Basingstoke, UK: Palgrave MacMillan, 2009), 2.
[113] Ruskin, letter to *The Times* (25 May 1854), quoted in 'William Holman Hunt, *The Awakening Conscience*, 1853, summary', *Tate website* <http://www.tate.org.uk/art/artworks/hunt-the-awakening-conscience-t02075/text-summary> accessed 5 June 2015.
[114] Auerbach, 15.
[115] Weltman, 58.
[116] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (1980), trans. Brian Massumi (London: Continuum, 2004), 262-63.

mineralogy's minutely constituent fragments in the face of geology's grand narratives. Deleuze and Guattari write that becoming is a liberating state, one only achieved through the identification with 'molecular' minoritarian positions; hence while they theorise 'becoming-woman', 'becoming-animal', 'becoming-molecule' and 'becoming-imperceptible', there is no equivalent 'becoming-man' within the 'molar' patriarchal state.[117]

It cannot be ignored that the performative or becoming objects in Ruskin's natural history lexicon – whether girls, flowers, birds or stones – remained heavily othered and fetishised, and hence in many ways remain firmly entrenched in Victorian tropes regarding gender and nature. However, these ideas suggest other ways to think about the role played by girls and by minerals beyond anthropomorphism. It is easy to picture Ruskin's mineral specimens, including his Rose-Fluors and those in the Native Silica display, in the role of surrogate girls, precious and sparkling and orderly under his command, '[r]eversing the Pygmalion myth', as Robson writes.[118] This displacement may equally relate to Ruskin's desire for and identification with young girls. And yet young girls may have held further symbolism for the nineteenth-century gentleman. As Robson explains, the girl-child was a popular point of identification for Victorian authors as an embodiment of purity; in one figure she contained both the Rousseauesque unspoiled mind of the child and the protected innocence of female domesticity.[119] As such, she provided a figure of escape for adult male fantasists including John Ruskin and Lewis Carroll, whose Alice books and corresponding stories concerning his personal life make him, along with Ruskin, one of the nineteenth century's two most 'infamous girl-lovers'.[120] Two of the prevailing tropes in this

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[117] Deleuze and Guattari, 300-308, 320.
[118] Robson, *Men in Wonderland*, 123.
[119] Robson, *Men in Wonderland*, 3-15. Robson points out that it is the feminisation of childhood in this period, in which boys, such as Ruskin, are routinely dressed in girlish clothing, that accounts for male authors' identification with girl-children, rather than boys. This is significant in that the men's 'lost girlhoods' remain captured in time – they never transmute or 'evolve' into manhood or womanhood. This idea relates importantly not only to Ruskin's own gender performativity, but also to the very potentiality of gender models outside the binary norm in this period.
[120] Robson, *Men in Wonderland*, 3. The accusation of Ruskin's paedophilia parallels that of Stuart Dodgson, better known as Lewis Carroll. Similar to Ruskin's rhetoric, Dodgson claimed he was attracted by children's 'unspoiled minds', which provided the 'material for him to work upon', which in Ruskin's case found its equivalent in the bare matter of the earth. Stuart Dodgson, *The Life and Letters of Lewis Carroll* (London: T. Fisher Unwin, 1898), 361. Several biographers have expressly ascribed Dodgson with paedophilic tendencies, but Karoline Leach suggests that myths based in early inaccurate biography have been reiterated to create the commonly accepted image of Dodgson as infantilised and depraved. Leach, *In the Shadow of the Dreamchild: A New Understanding of Lewis Carroll* (London: Peter Owen, 1999). Hughes Lebailly suggests that Dodgson's child photography should be received within the context of the 'Victorian child cult', in

fantasy epitomised by the young girl are of nostalgia and nationalism; the girl symbolises lost childhood and accordingly, the bygone days of rural England.[121] This is evident in *Ethics* in Ruskin's prefatory notes emphasising the rural isolation of the country girls' school, as in his recurring evocations of the timeless English countryside throughout the Lecturer's attempted moulding of the perfect citizens. In the links between the text and Ruskin's display of the varieties of silica crystals 'native' to Britain, these connotations further assert themselves. Ironically, Ruskin's metamorphic version of nature, for all its radical implications, is primarily mobilised to assert a petrified vision of society, channelled through the crystal-girls and girl-crystals of the English countryside.

Virtues and Vices

A photograph of the orderly and symmetrical space of the main Mineral Gallery taken from the vantage point of the Pavilion contrasts the Gallery's uniform glass-covered table-cases, illuminated by regular framed texts, against a lone freestanding specimen of meteoric iron (fig. 2.8). Forced to speak for itself and available for handling, the meteorite suggests an infringement on the taxonomic and scopic confinement of the majority of the collection. I would argue that one encounters a similar duality in Ruskin's own taxonomy of girls and stones, which are simultaneously laid bare to close physical scrutiny and relentlessly classified and confined. What is perhaps most disturbing about Ruskin's imagined relationship to girls in *Ethics of the Dust* is not its excessive intimacy, but its containment within a meticulously organised structure, best exemplified by the verbal image of the girls arranging themselves, petticoats and all, according to an infallible crystalline geometry. The atomic girls, who are listed by age, name and character in the front matter, are continually deconstructed throughout the text, according to physical characters (the dark eyes of Egypt, Dora's immaculate plaits), abilities (Sibyl's knowledge of Latin) and actions (their coquettish hiding from and mocking of the old Lecturer, Isabel jumping on his lap).[122] Ruskin/the

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which child nudity was symbolic of innocence. Lebailly, 'C. L. Dodgson and the Victorian Cult of the Child', *The Carrollian*, 4 (autumn 1999), 3-31.

[121] Ruskin writes, 'The last and worst thing that can be said of a nation is, that it has made its young girls sad, and weary.' *Ethics*, 135.

[122] Ruskin, *Ethics*, 1, 133, 129.

Lecturer penetrates their physical being with mineralogical precision, comparing the fine veins of rocks with those in a child's hand.[123] He reviles the ugliness of what lies beneath their fair visages: 'the shapes of the jawbones, and of the cartilage of the nose, and of the jagged sutures of the scalp', anatomy which reveals 'the daily processes of nourishment and decay'.[124]

Ruskin's denigration of the bodily and the material and their anatomical and entropic processes – in short, the abject – appears to reflect his own anxieties from which he sought escape in his parental home and the fairy world of his writing. In turn, in passages such as the above, he exercised fictional control, ultimately by turning his precious specimens – whether fictionalised girls or actual crystals such as the Rose-Fluors – into allegories. But while the inside-out physiologies appear too close for comfort, they are characteristic of the study of mineralogy itself. The dialect of brecciation, contraction, desiccation, concretion, brachiation, reticulation, striation and cementation of amygdaloids, pisolites, porphyries, veins, pores and films characterises the punctiliousness of the crystallographer's work, and perhaps the ultimate futility of its classificatory systems. This trickiness manifests in the problem of pseudomorphs, crystals which chemically belong to one mineral category but assume the form of another, and, in Ruskin's display in the Museum, different types of silica, which are frequently similar chemically but dissimilar structurally.[125] Surely, Ruskin took pleasure in such hybrid forms, obscure classifications and the esotericism they lent the enterprise of mineralogy. The very challenge of containment resonates with *Ethics of the Dust's* fantasy of control.

Unifying the intimate knowledge of crystals and its instruction for young girls is a regime of purity and virtue indicated by the title of *The Ethics of the Dust*. Ruskin contributed to what Pointon has identified as a nineteenth-century regulatory discourse which discouraged the wearing of precious jewels by young women.[126] He instructed girls and women on how to bejewel themselves 'professing godliness', disparaging diamonds and gold as the media of avarice.[127] External matters such as dress, adornment and composure prove fundamental to the education of the 'little housewives' as the Lecturer in *Ethics* warns them

[123] Ruskin, *Ethics*, 197.
[124] Ruskin, *Ethics*, 97.
[125] My thanks to Peter Tandy, curator of mineralogy at the Natural History Museum, for his explanation of silica's traits. Personal communication (6 June 2011).
[126] Pointon, 21-22.
[127] Ruskin, 'Iris of the Earth', 139; Ruskin, *Ethics*, 15.

against thinking too deeply about what lies within. Referring to the wretchedness of skulls, he questions, 'And if you could all see in each other, with clear eyes, whatever God sees beneath those fair faces of yours, you would not like it?' His lesson: to know thyself, do not look within, but without.[128]

Ruskin's paradoxical message against artifice while in defence of surface resonates not only with art historical discourse concerning colour (including his own), but also concerning female beauty. Like Lichtenstein, art historian Tamar Garb draws an inseparable link between the artifice of cosmetics and of art.[129] While colour was implicitly associated with illicit pleasures and feminine seduction, as in heavily made-up prostitutes, and obvious make-up was seen as vulgar, cosmetics were nevertheless deemed a necessary component of femininity and its representation.[130] Garb explains how delicately detailed and coloured surfaces were taken as intrinsic to feminine appearance and its representation in portraiture, given 'the role that women played as alluring spectacles'.[131] Where Garb finds a repeated equivalence between the painter's act and women's self-maquillage, Ruskin transposes this analogy and its inherent moral lessons concerning artifice, self-presentation and modesty onto stones.

However, Ruskin's writing is not unique in drawing moral principles from minerals – and with specific implications concerning gender. Published two years before *The Ethics of the Dust*, George Sand's fantastic novella *Laura: A Journey into the Crystal* (1864) features a dazzling crystalline alternative universe whose gatekeeper is a teenage girl. Protagonist Alexis Hartz, assistant curator of mineralogy in a small natural history museum, is initially guilty of the sin of idleness but is coaxed into accomplishment and learnedness in the presence of minerals. However, he ends up a 'victim of the crystal' at the hands of his 'delectable' sixteen-year-old cousin Laura.[132] Together they enter a portal into an amethyst geode containing a microcosmic world 'where all is transparency and crystallisation':

> [A] block of hollow flint, the size of a melon cut in half and lined inside with prismatic crystals of irregular size and groupings, was in reality a ring of tall mountains enclosing an immense basin filled with steep hills

[128] Ruskin, *Ethics*, 97, 100.
[129] Lichtenstein, 42, Garb, 1-17.
[130] Lichtenstein 189-90; Garb, 3.
[131] Garb, 2.
[132] George Sand, *Laura: A Journey into the Crystal* (1864), trans. Sue Dyson (London: Pushkin, 2004), 11, 15.

> bristling with needles of violet quartz, the smallest of which might have exceeded the dome of St Peter's in Rome both in volume and in height.[133]

Here Alexis discovers glaciers made of quartz, forests of beryl and sapphire, opal oceans, turquoise islands and a blazing diamond sun.[134] In this world of illusion, which turns the normal one into a 'vain fantasmagoria', Laura transforms into an ethereal and immortal being.[135] Alexis's estimation of and desire for his cousin wax and wane between the enhanced experience of the crystal world and her prosaic real-life presence.

Typical of its time, Sand's narrative presents a dialectic between science and the imagination. On one hand it emphasises the important truths revealed in the empirical study of microcosmic entities, enriched with moral meaning. Yet at the same time it is a cautionary tale of overinvestment in the scientific study of minutiae. Laura appears as a beacon and ultimately saviour when she eventually shatters the crystal and its illusory world.[136] Thankful, Alexis learns to settle for reality and the real Laura, who after their marriage ends up a 'round matron' surrounded by children, in contrast with the 'ideal being' of her crystal self.[137] He concludes:

> So you see in me a man who has happily rounded the cape of illusions and who will no longer allow himself to be caught in the luxuries of his fantasy, but who is not too angry to have been through that delirious phase where imagination knows no hindrances, and where the poetic sense warms in us the aridity of calculations and the icy terror of vain hypotheses.[138]

Like *The Ethics of the Dust*, the allegory of *Laura* conflates the beauty of crystals with that of girls and young women, as a locus of potential moral ambiguity. A narrative thread runs through the book that sees women as particularly interested in the puerile 'science of details' and showy jewels; these belittled aspects of mineralogy are contrasted against the properties of iron and coal that represent the industry of the future.[139] Two decades after the publication of Ruskin's and Sand's feminised crystal parables, Joris-Karls Huysmans's Symbolist novel *À Rebours* (commonly translated as *Against Nature*, 1884) imbued precious stones with blatant decadent associations by flipping their

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[133] Sand, 11, 25.
[134] Sand, 29-30.
[135] Sand, 47.
[136] Sand, 123-24.
[137] Sand, 126, 48.
[138] Sand, 126.
[139] Sand, 21-23.

gendered associations. The protagonist Des Esseintes, an effete and immoral aristocrat and aesthete, decides to encrust his pet tortoise in rare and colourful jewels.[140] Following upon pages of pained analysis of which stone would be suitable for the task of turning the animal into a 'gigantic jewel', Des Esseintes literally gilds and bejewels living nature.[141] In the text the overinvestment into vivid gemstones becomes symptomatic of excessive aestheticism and its associations of effeminacy and immorality – the book was received as irreligious.[142]

Huysmans's decadent employment of jewels sits on the opposite end from Ruskin's pious ethical aesthetics and redemption of stones. In his essay 'The Iris of the Earth' in *Deucalion*, Ruskin further expounds his reverent belief in externals, again mobilising the metaphorics of stones and femininity for his platform. Once again to illustrate the knowledge to be found in minerals beyond mere scientific composition, he compares the chemical composition of a piece of flint – silicon, oxygen and iron – with that of a human – carbon, nitrogen, lime, phosphorus and water – concluding, 'but then, that doesn't tell us what we are, – what a child is, or what a boy is, – much less what a man is, – least of all, what supremely inexplicable woman is'.[143] In this treatise on the symbolic function of stones (with particular regards to their colouring), following his overarching question, 'Are we right in setting our hearts on these stones, – loving them, holding them precious?' the general concern becomes gender-specific in his answer: 'Yes, pretty ladies! love the stones, and take care of them; but love your own souls better, and take care of *them*, for the day when the Master shall make up His jewels.'[144] Continuing the thread of symbolic virtue in outward appearance, he instructs the 'young ladies', '[I]t is *you* whom God likes to see well-decorated. … You are yourselves the Church, dears.'[145]

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[140] Joris-Karls Huysmans, *Against Nature* (1884), ed. and trans. Brendan King (Sawtry, UK: Dedalus, 2008), 71-74.
[141] Huysmans, 72.
[142] See Brendan King, 'Introduction', in Huysmans, 2.
[143] Ruskin, 'Iris of the Earth', 101.
[144] Ruskin, 'Iris of the Earth', 135-36.
[145] Ruskin, 'Iris of the Earth', 139. Emphasis in original. Ruskin's rhetoric echoes passages from the Book of Isaiah in which God promises to the barren woman to lay the city of New Jerusalem with precious stones and sparkling jewels: 'O thou afflicted, tossed with tempest, and not comforted, behold, I will lay thy stones with fair colours, and lay thy foundations with sapphires. | And I will make thy windows of agates, and thy gates of carbuncles, and all thy borders of pleasant stones. | And all thy children shall be taught of the LORD; and great shall be the peace of thy children. | In righteousness shalt thou be established: thou shalt be far from oppression; for thou shalt not fear: and from terror; for it shall not come near thee.' Isaiah 54, 11-14.

These commandments come with strict guidelines – Ruskin insists on the higher ultimate value of stones that are left unworked:

> For literal truth of your jewels themselves, absolutely search out and cast away all manner of false, or dyed, or altered stones. And at present, to make quite sure, wear your jewels uncut; they will be twenty times more interesting to you, so.[146]

Such directives resonate strongly with Ruskin's earlier rhetoric on architecture, which he set out initially in his 1849 publication *The Seven Lamps of Architecture*. Under 'The Lamp of Truth', he posits his theory of truth to materials in structure and decoration, with maxims such as, 'The true colours of architecture are that of natural stone.'[147] He eschews both 'structural deceits' and 'surface deceits'; an example he gives of the latter is wood painted to resemble marble, a process that echoes the mineralogical process of pseudomorphism – when stones take on 'false form'.[148] As in *Ethics* and 'The Iris of the Earth', this dogma comes down to obedience to God and His intentions in form and material.[149] Truth to nature, which negates hubristic artifice or ostentation, is to Ruskin the utmost form of piety.[150]

Beauty and Function

However, inherent to Ruskin's ideal of truthfulness, for all its modesty, was beauty. In *The Stones of Venice*, he elaborates on the ideas set forth in the *Seven Lamps* that while the material used should always suit the material represented, it must also highlight the beauty of the actual material itself.[151] Ruskin intended for the exhibition of Native Silica in the Natural History Museum to communicate humble yet beautiful truths. From the moment Fletcher had invited Ruskin to prepare the exhibition of silica – or chalcedony, as it was synonymously called – Ruskin expressed great pleasure in what he perceived as their combination of unassuming accessibility and rare beauty. In response to Fletcher he wrote:

> Forgive me if I snap too like a puppy at the lovely morsel you offered me just as I was going away yesterday – the re-arrangement of the

[146] Ruskin, 'Iris of the Earth', 136.
[147] Ruskin, *The Seven Lamps of Architecture* (London: Smith, Elder, 1849), 47.
[148] Ruskin, *Seven Lamps of Architecture*, 32, 41.
[149] Ruskin, *Seven Lamps of Architecture*, 40-41.
[150] Ruskin complains about the 'flash' of armour as ornament in Renaissance art and architecture. *Ruskin, The Stones of Venice*, vol. 1, 207.
[151] Ruskin, *Stones of Venice*, vol. 2, 391.

> chalcedonies. They are such pretty things – such strange ones and such findable ones – that of all minerals, they, it seems to me, ought to be most recommended to the public notice.[152]

Ruskin felt this union of visual interest with commonness fully commendable – he goes on to proclaim how, unlike diamonds and other precious stones, a schoolboy could actually collect silica specimens. However, as evidenced in his regular letters to Fletcher regarding his selection and re-selection of specimens to include in the display, Ruskin insisted on spectacular examples of these common crystals. In the accompanying catalogue he writes that there are 'few minerals being shown in this selected series but those which, though here seen in their finest conditions, are in their less striking forms of frequent occurrence, and of extreme importance in the structure and economy of the world'.[153]

This leads to yet another contradiction in Ruskin's mineralogy and in the Museum context. His maxim that virtue is to be found on the outside, maintained in the painstaking descriptions and careful arrangement of the specimens of native silica, is fostered by the display of unglamorous stones that are nevertheless of 'extreme importance' and seen here in their 'finest conditions'. It defies the message communicated in the stratified displays of the geological collections. Yet while the Mineral Gallery is proclaimed to be in contrast non-animal and inorganic, it is at the same time firmly human: its objects and displays emphasise the stories of people – 'the structure and economy of the world' to which Ruskin alludes – rather than of the earth. These stories are both utilitarian – of industry and earth resources – and ornamental – of jewellery and decorations. In the guide, Fletcher describes the scope of the gallery and the usefulness of its contents:

> Here will be found, in all their variety, beauty and association, the minerals which, under the name of *ores*, furnish the metals so essential to the needs and happiness of man; here also are the specimens of the numerous minerals which, whether immediately or as the sources from which manufacturers derive important products, are employed in the multifarious purposes of daily life. The suggestion that materials for construction and architectural ornament, for pigments, mordants and bleaching processes, that the phosphates for manures, the alkalies, and the materials for the manufactures of acids, are all largely dependent on the mineral resources of the world, will sufficiently show how intimately a complete mineral collection is connected with the arts and with commerce.[154]

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[152] Ruskin, letter to Lazarus Fletcher (probably Mar. 1884), U DP/8/27, Hull History Centre Archives.
[153] Ruskin, *Native Silica*, vi.
[154] Fletcher, 14. Emphasis on the social role of minerals traces back to earlier in the century, with Buckland's mineralogical focus on coal and its use to humans. William Buckland, 524-47.

The celebration of industry follows the example of the 1862 International Exhibition, the former site of which gave way to the Natural History Museum, and the preceding Great Exhibition of 1851, whose focus on the 'Industry of all nations' extended to the succeeding museum centre in South Kensington.[155] Like the Great Exhibition, the International's mineral displays were solely categorised by industrial and commercial function – mining and quarrying operations, coals and minerals used as fuel, clays, building stones, salt, gems, stones used for ornament and so forth.[156]

Fletcher's rhetoric clearly sought to capture the fervour that had surrounded the industrial exhibitions, which ultimately positioned the British Empire as leading the world in this area. However, while displays and texts acknowledged the functional purposes of its specimens, in the fragmented and formalist displays in the Mineral Gallery a taxonomy more aligned with that of ornament appears to dominate. Pointon writes that this link and its distinction from geology is characteristic of mineralogy and in particular Ruskin's:

> Geology is concerned with the earth's formation, with what lies beneath the surface, and with its history. Mineralogy with its interest in bit-parts, fragments and the minute pieces picked up, as Ruskin often described himself as having done, along the way, or found by miners accidentally, is far less readily identifiable in professional terms. Linked to the histories of collecting and ephemera of all kinds, and to the luxury trades of jewellery, to exotica, ecclesiastical treasuries and reliquaries, and to gross human wealth and display, mineralogy is a culturally inflected body of knowledge in ways that differentiate it sharply from geology.[157]

Nowhere is this cultural primacy more evident than in the singularly discrete and aesthetically valuable specimens that surrounded the Native Silica display in the Mineral Gallery's Pavilion. In relation to the larger Mineral Gallery, the Pavilion appears to have functioned similarly to the Index Museum, with displays inflected by culture – meteorites accompanied by the stories of their discovery, decorative stones, worked specimens and of course, a display of silica curated by John Ruskin – and more readily accessible to the general public. The display of meteorites varied with size, though some – such as the specimen of meteoric iron – were freestanding and took on a sculptural quality in the gallery (fig. 2.9). Both their earthly and otherworldly providence was emphasised in their

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[155] Prince Albert, quoted in Anthony Burton, *Vision and Accident: The Story of the Victoria and Albert Museum* (London: V&A, 1999), 42.
[156] John Hollingshead, *A Concise History of the Great Exhibition of 1862: Its Rise and Progress, Its Building and Features and a Summary of All Former Exhibitions* (London: Her Majesty's Commissioners, 1862), 71.
[157] Pointon, 316.

descriptions.[158] The decorative stone display included a tabletop of serpentine, which held a collection of polished pebbles. Worked specimens included both antique and exotic cups, saucers, bowls, spoons, snuff-boxes and other ornamental objects carved from various stones and crystals (fig. 2.10). The Pavilion also held specimens too large to fit into the table cases of the main gallery.[159] While this reconstruction of the variegated Pavilion may suggest more in common with the Geology Gallery than initially conceded, the decorative quality of its objects and displays may in fact forge a stronger link to the nearby South Kensington Museum and its taxonomic displays of objects of commerce and design intended to educate the public in good taste.[160]

The beauty of crystals marks a dominant narrative throughout the mineralogical displays, underscored by the Museum's decision to invite John Ruskin to assist in its displays. This, as I have argued, was in keeping with the science as a whole. Sowerby suggests that crystals are to the mineral kingdom as flowers are to the vegetable: 'Each gives a charm to its respective study, which is perhaps necessary to secure for it that degree of attention it deserves.'[161] Like flowers, crystals possess conspicuous beauty, that 'superficial gratification' necessary, Sowerby argues, to become enchanted by the study and hence delve into its deeper truths. However, as he comments, this beauty runs deep:

> But here we find no lack of beauty, of diversity of form, or of general superficial attractions. On the contrary, the more deeply we become initiated into the mysteries of crystallography, the more we do become enamoured of it, for we find, at every step, new and beautiful truths developing themselves, and hourly discover fresh paths strewed with new and brilliant flowers.[162]

Sowerby's statement encapsulates the fundamental tension at the heart of mineralogy, in particular Ruskin's. It is embodied in his belief against working stones, despite his numerous examples of polished specimens – the practice is necessary to demonstrate the inherent beauty of the crystals (but can make them harder to identify).[163] The conspicuous beauty and conspicuous consumption suggested by displays in the Mineral Gallery, and in particular the Pavilion, seem

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[158] See Fletcher, *An Introduction to the Study of Meteorites* (London: British Museum (Natural History), 1881), and Mervin Herbert Nevil Story-Maskelyne, *Catalogue of the Collection of Meteorites Exhibited in the Mineral Department of the British Museum* (London: British Museum (Natural History), 1869).
[159] Fletcher, 114.
[160] See Burton, 45.
[161] Sowerby, 45.
[162] Sowerby, 45-46.
[163] Tandy.

to thwart Ruskin's utmost values of modesty and religiosity – his emphasis on the 'dust' over jewels – notwithstanding that in his estimation such virtues were to be achieved through materialism.

Becoming Mineral

Ruskin's recurring theme of the containment of degradation and sin by virtuous surface may symbolise his wish to allay the threats of an encroaching science of chaotic movements and inhuman formulations, of the blossoming sexuality of young women or of his own attraction to these pubescent girls. Yet it may equally point towards a dialectic of life and death. The dust of *The Ethics* not only refers to humble materials, but equally signifies their transience. Juxtapositions of great age and decay with youthful freshness are invoked throughout the text, not least in the contrast between the Old Lecturer, who is listed in the front matter as being 'of incalculable age', and the effervescent assortment of young girls, of whose blooming demeanours and vital spirits the reader is constantly reminded.[164] This contrast was so integral to Ruskin that he cast himself as an elderly man despite only being forty-seven at the time of the book's publication. However, as several writers have pointed out, while the supple and buoyant flesh of the girls forms a standing contrast against the hard, craggy surfaces of the rocks – and of the Lecturer – the girls are the ones who are crystallised in time: 'For Ruskin and *The Ethics of the Dust*', Robson writes, 'the girl is the past and the crystal even as she is physically present.'[165] Symbolic of a lost England – or of Ruskin's lost childhood – the girls cloistered in their country school take on a glittering timelessness. The stones become a conduit between their eternal perfection and the inevitable decay of the ancient Lecturer. Pointon writes that this nostalgic crystallisation was 'symptomatic of a poetics – and a politics – that positions the feminine within a historical system that Ruskin himself devised and controlled'.[166] His aesthetic and scientific ideals and their informing social beliefs are reactionary, a last gasp of romantic symbolism before ornament and natural theology were made obsolete by the end of the century.

[164] Ruskin, *Ethics*, 1.
[165] Robson, *Men in Wonderland*, 120.
[166] Pointon, 323.

However, there may be more to Ruskin's peculiar and obsessive crystallisation of young girls than a personal denial of death or a politics of social conservatism. The ostensible object of *The Ethics of the Dust* is to demonstrate the lives and deaths of stones; the Lecturer's lessons repeatedly inculcate the transience, or even mortality, of minerals and their susceptibility to the influences of time and decay. Asked what kinds of trials crystals might have, he responds, 'Trials much like our own. Sickness, and starvation; fevers, and agues, and palsy; oppression; and old age, and the necessity of passing away in their time, like all else'.[167] As with the Couttet Rose-Fluors and the pyramids in Egypt, their resilience is deceptive and their origins are always present in their make-up. In one excessively anthropomorphic and ideological passage, the Lecturer explains:

> And sometimes you will see little child-crystals put to school like school-girls, and made to stand in rows; and taken the greatest care of, and taught how to hold themselves up, and behave; and sometimes you will see unhappy little child-crystals left to lie about in the dirt, and pick up their living, and learn manners, where they can. And sometimes you will see fat crystals eating up thin ones, like great capitalists and little labourers; and politico-economic crystals teaching the stupid ones how to eat each other, and cheat each other; and foolish crystals getting in the way of wise ones; and impatient crystals spoiling the plans of patient ones, irreparably; just as things go on in the world.[168]

Throughout *Ethics* and in other texts, Ruskin imbues minerals with life, albeit according to a wholly different model than that found in geology, as well as that expounded in the Natural History Museum. When Mary queries what it is that separates people from the dust, the Lecturer explains, 'Things are not wholly alive, or wholly dead. They are more or less alive.'[169] He explains that a 'gradation of life' accounts for both nobler life forms than humans as well as the less noble form of life found in the dust.[170]

In this Ruskin reveals his idiosyncratic views concerning natural science as well as religion. Although he was against evolutionism, he was not a straightforward natural theologian.[171] In fact his poetic-symbolic vision of nature harked back to natural philosophy predating the nineteenth century. He rejected Linnaeus's taxonomy of plants because, much like Darwin's theory of evolution, its focus on sexual functions over beauty appeared overly mechanical and

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[167] Ruskin, *Ethics*, 175.
[168] Ruskin, *Ethics*, 193.
[169] Ruskin, *Ethics*, 207, 211.
[170] Ruskin, *Ethics*, 212.
[171] Weltman, 59.

deterministic to him.[172] He faulted the lack of spirit and beauty in such theories; most of all he eschewed their inability to locate meaning in nature.

His work in the Natural History Museum communicated his prioritisation of meaningful ideas over crude scientific data, as evidenced in his selection, placement and illumination of the silica specimens, but also in the instructions regarding his several donations. Upon the donations of precious stones – the Couttet Rose-Fluors in 1850 and the Colenso Diamond and Edwardes Ruby in 1887 (figs 2.11, 2.12) – he insisted that specifically worded labels be displayed with each, never to be altered. Regarding the Colenso Diamond, he wrote to Fletcher:

> The Diamond is *not* to be called the Ruskin, nor the Catskin, nor the Yellowskin, diamond. (It is not worth a name at all, for it may be beaten any minute any day by a lucky Cape digger). But I will give it to the Museum on the condition of their attaching this inscription to it:
> The Colenso Diamond
> Presented by John Ruskin
> In Honour of his friend, the loyal and patiently Adamantine
> First Bishop of Natal.

That the instruction is an attempt to overcome any impersonal, soulless scientific meddling by the Museum is evident in his following statement regarding the stones:

> And I will come to the Museum to see them placed, by you – and then – they are not to be knocked out of their place, and [illegible] by any miserable little Darwinian cad whom you choose to use for an assistant.[173]

As Pointon suggests, naming the crystals after their original owners furthermore enhances the accessibility of the specimens to the layperson – their providence gives them a life of their own, beyond the spiritless classifications of modern science, and again, prioritising human stories over geological time.[174] However, as the preceding discussion demonstrates, Ruskin's goal was not an erasure of earth stories, but rather their saturation with human meaning, and vice versa. In his dissatisfaction with contemporary scientific developments, Ruskin was not alone. Corresponding to Ruskin, Harry Govier Seeley, chair of geology at King's College, London, wrote:

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[172] See Weltman, 48-54. On Ruskin's relationship to Darwin, see Prodger, 40-58.
[173] Ruskin, letter to Lazarus Fletcher (Sandgate, 14 Dec. 1887), U DP/8/44, Hull History Centre Archives.
[174] Pointon, 347. In contrast, Ruskin stated in the Native Silica catalogue that names of donors should be merely registered in British Museum's historical account and 'should cease to encumber either the cases, or the scientific guides to them'. Nevertheless, the catalogue included donors' names. Ruskin, *Native Silica*, viii.

> Probably, most scientific men, whose grasp is wide enough to know what it is that science has to say to the aspirations of individuals and communities, would share your want of respect for the torrent of new discoveries which ploughs its way over the garden ground of their lecture-fields.[175]

As well as industrial disease and the 'brain fever' of scholars, dust was associated with the continuity of life and death.[176] Ruskin's contemporary, the French historian Jules Michelet believed that breathing in the 'dust of the dead' of the archive enabled him to speak on their behalf.[177] Historian Carolyn Steedman writes: 'Dust allowed him a perception of time as a kind of seamless duration in which past and future could not be sundered'.[178] Correspondingly, Steedman theorises that following on mid-century work in physiology, cell-theory and neurology, dust was not understood as indicating waste, but rather circularity: 'the impossibility of things disappearing, or going away, or being gone.'[179] The implication that '*nothing goes away*' was in tune with Ruskin's vision of crystallised history, manifest in his perpetuated 'narrative of the self' based in childhood, played out as a sort of Peter Pan syndrome.[180] In contrast with dust's rudimentary, ubiquitous and sedimentary nature, glittering jewels had the potential for deception, as they could be forged through chemical synthesis, and the realm of optical illusions. In her history of the chemical industry, Esther Leslie writes that gemstones were heavily associated with the commercial spectacle of the arcades and their 'gleam, phosphor and glitter' with jewels displayed for purchase and imitated in architecture and design.[181] As such they were components of the disorientating modern city, worlds apart from Ruskin's crystallised rural idle.[182]

It is clear that Ruskin took issue with the rapid developments in science which he believed were supplanting the deeper lessons that could be obtained from nature, as well as the corresponding developments in modern culture. Although in *The Ethics of the Dust* the lessons of virtue in the face of inevitable decay come across primarily as a warning for the girls, they may have other, more radical implications. Just as Ruskin's ideas about science go beyond adherence to

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[175] Harry Govier Seeley, letter to John Ruskin (Sevenoaks, 3 Apr. 1885), U DP/7/47, Hull History Centre Archives.
[176] Steedman, 22.
[177] Steedman, 71.
[178] Steedman, 161.
[179] Steedman, 164.
[180] Steedman, 76. Emphasis in original.
[181] Leslie, 96-7.
[182] Leslie, 99.

natural theology or a reaction against evolution, the role of the little girl, like that of minerals, may be more complex than a regulative symbol of nostalgia, virtue or nationalism. It may in fact correspond to Ruskin's continued belief in metamorphosis, which in his work occurs not simply within species, but between animals, humans, plants, crystals and even sweets. This free-flowing and symbolic exchange resisted linear versions of evolutionary change.[183] Deleuze and Guattari's molecular concept of becoming indicates a flow of relationships, rather than a progressive evolution – the philosophers relate becoming to a non-evolutionary natural history: 'Becoming is a rhizome, not a classificatory or genealogical tree.'[184] In her minoritised position, the philosophers uphold the girl-child as the ultimate figure of becoming:

> The girl is certainly not defined by virginity; she is defined by a relation of movement and rest, speed and slowness, by a combination of atoms, an emission of particles: haeccity. She never ceases to roam upon a body without organs. She is an abstract line, or a line of flight. Thus girls do not belong to an age group, sex, order, or kingdom: they slip in everywhere, between orders, acts, ages, sexes.[185]

This abstracted mobilisation of girls as the embodiment of becoming risks further invalidation and othering; much as in Ruskin's work, girls are at once fetishised and employed as ciphers.[186] And yet the transgressive, changeable identity Deleuze and Guattari ascribe to girls due to their marginalised position

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[183] See Weltman, 49-50.
[184] Deleuze and Guattari, 258-63.
[185] Deleuze and Guattari, 305.
[186] Gayatri Spivak has criticised Deleuze and Guattari's professed indifference to ideology as absolving responsibility of their theorising towards real power imbalances. By disassociating theory from representation, she argues, Deleuze sanctions the intellectual to speak for the oppressed group; Spivak's critique follows Said's characterisation of Foucault's mystified categorisation of power, which obliterates oppressive capitalist structures, thereby perpetuating production of the Other by assuming its voice. Spivak, 'Can the Subaltern Speak?' in C. Nelson and L. Grossberg, eds, *Marxism and the Interpretation of Culture* (Basingstoke, UK: MacMillan, 1988), 68, 70, 75. A relevant debate has recently ensued following the English translation publication of Tiqqun, *Preliminary Materials for a Theory of the Young-Girl* (1999), trans. Ariana Reines (Los Angeles: Semiotext(e), 2012). Tiqqun, a French radical philosophy and publishing group, demonstrates Foucauldian and especially Deleuzian influence in their conception of the Young-Girl as a symbolic figure that combines the youth and femininity preyed upon by capitalistic consumerist society, and as such offers transcendence from its ills. Like Deleuze and Guattari, they mobilise the girl as a disembodied and supposedly genderless '*polar figure*' and '*vision machine*'. Tiqqun, 15, 14. Emphasis in original. For critiques of Tiqqun's appropriation and colonisation of the girl as Other, see Nina Power, 'She's Just Not That Into You', *Radical Philosophy* (2012) <http://www.radicalphilosophy.com/web/rp177-shes-just-not-that-into-you> accessed 4 Mar. 2104; and Moira Weigel and Mal Ahern, 'Further Materials Toward a Theory of the Man-Child', *The New Inquiry* (9 July 2013) <http://thenewinquiry.com/essays/further-materials-toward-a-theory-of-the-man-child/> accessed 4 Mar. 2014. For a counter-critique see Jaleh Mansoor, 'Notes on Militant Folds: Against Weigel and Ahern's "Further Materials Toward a Theory of the Man-Child', *The Claudius App* (Aug. 2013), <http://theclaudiusapp.com/5-mansoor.html> accessed 4 Mar. 2014.

suggests yet another potential reading of their significance for Ruskin, and their relationship to minerals. Robson and others suggest that they represent a yearning for the freedom of childhood lost, and yet one that is frozen forever in stone. A dynamic, molecular understanding of minerals, which is in keeping with Ruskin's continual emphasis on the cyclical lives of stones, may liberate the girls' relationship to them. Perhaps the significance of the girls lies in their molecularisation or mineralisation, rather than a traditional crystallisation. The in-between position this signifies may have in fact been what attracted nineteenth-century writers such as Ruskin and Carroll more than a frozen paradigm, and may explain the connection to the metamorphic substances of minerals. And perhaps girls deserve more credit than many contemporary commentators on Ruskin have given them.

Conclusion

Ultimately, Ruskin's mineralogy, which found sympathy in the Mineral Gallery, rejected what he perceived as the cold, ugly science ushered in during the second half of the century, presaged by early nineteenth-century geological findings and epitomised by Darwin's theory of evolution. His version of 'the dust' presented an alternative conception of the recently opened up infinite time of the earth's surface, one based in the microcosmic 'lives' of individual stones, humanised so that, as Ruskin's contemporary philosopher and historian Thomas Carlyle wrote of the biographies of men, each life was 'a whole epitome of the infinite'.[187] Ironically, just as Ruskin personified stones, he petrified the girls he deployed to bring mineralogy to life in his quasi-fictional *Ethics of the Dust*, he himself – or a close caricature of himself – playing the role of puppet master. And yet his eccentric take on the science brought to the fore a feminisation and aestheticisation that proves consistent with mineralogy's counter-discourse emphasising beauty, colour, shine, touch, taste and even allegory.

The harmonious position of Ruskin's mineralogy within the Natural History Museum suggests that the same anxieties he harboured toward modern science lay manifest in the institution, while the aestheticised cultural narratives

[187] Thomas Carlyle, 'Biography', *Fraser's Magazine* 27 (Apr. 1832), in *The Works of Thomas Carlyle*, vol. 2 (Cambridge: Cambridge University Press, 1899), 52.

maintained in the Mineral Gallery may appear more in keeping with the nearby South Kensington Museum than other natural history displays. Photographs of the Natural History Museum's mineral specimens in isolation against stark black or white backgrounds from the 1910s suggest the initiative to overcome nineteenth-century aesthetic associations (fig. 2.13). Meanwhile, a 1909 three-colour photograph of an opal in matrix from the collection exemplifies the chemical syntheses and reproductive technologies of a new era of scientific analysis and imaging that Ruskin would have shunned (fig. 2.14).[188] With its vivid surface hues and yet sense of three-dimensionality set in relief against the vacuum of its black background, the opal creates a stark contrast against the 'little rosy transparent pyramid' of Ruskin's Rose-Fluor.[189] The former's new paradigm of illusion, or 'gleam, phosphor and glitter' negates the lesson of labour and morality with which the latter was intended to 'awaken in the minds of young girls, who were ready to work earnestly and systematically, a vital interest'.[190]

Much like his acute attention to artistic detail, Ruskin's passion for intricate, colourful stones and its association with 'effeminacy' encapsulate the fusty Victorian aesthetic which has made his work unfashionable by modern standards. Meanwhile these very traits were intrinsic to Victorian mineralogy. Ruskin's mineralogy for all its idiosyncrasies clearly reflects the constraints of its time as regards gendered ideas around virtue, nature and society. But while his mineral morals, harking back to early modern readings of nature, may appear irrelevant in light of later nineteenth-century developments in chemistry and crystallography, they equally present alternative understandings of stones as architectonic, metamorphic, anthropomorphic and theatrical that are radical in their implications. Ruskin's alternative model of mineralogy not only shaped the display practice of the Mineral Gallery, but also lays bare other transgressions of the dominant narratives within the Natural History Museum.

[188] For more on the three-colour printing process see: Arthur Freiherrn von Hübl, *Three Colour Photography: Three-Colour Printing and the Production of Photographic Pigment in Natural Colours* (1897), 2nd edn, trans. Henry Oscar Klein (London: A.W. Penrose & Co., 1904).
[189] Ruskin, *Ethics*, 35.
[190] Ruskin, *Ethics*, viii.

CHAPTER THREE

No Fancy So Wild: Slippery Gender Models in the Coral Gallery

The *Physophora hydrostatica* (c. 1876) that sits in a specially constructed foam storage vessel in the basement of the Natural History Museum in South Kensington is one of over 185 glass models of marine invertebrates purchased by the Museum from the father-son glassmakers Leopold and Rudolf Blaschka between the years 1866 and 1889 (fig. 3.1).[1] Descending from its pinnacle, a series of transparent glass bells correspond to the ocean animal's gas-filled floating mechanisms. Outstretched finger-like protrusions of a soft apricot shade appear rubbery; in the animal these tentacles are capable of dangerous stings. Emerging from yet another layer of tentacles, tubular and whitish-hued, a cascading tangle of fine wire ending in delicate glass droplets emulating thousands of trailing polyps is reminiscent of jewellery. The finely worked and naturalistic object, much like the animal itself, appears fragile and otherworldly.

The *Physophora hydrostatica* is, however, not an individual animal, but a siphonophore colony. Siphonophores comprise numerous small organisms living together in unity. Such deep-sea species captured the cultural imagination in the later decades of the nineteenth century, as significant to scientific discovery, in particular evolutionary theory, as well as art and design. Their centrality to scientific and material culture provided a context in which the Blaschkas implemented a business producing thousands of models of marine invertebrates to be purchased by museums and individuals throughout the world.[2]

Like the animals on which they are based, the Blaschka models are queer objects, difficult to get a grasp on. They skilfully and poetically freeze the life of the sea in glass, a process that for all its inherent material contradictions – between slimy, spineless aquatic creatures and brittle, static objects in the dry museum air – at once seems intuitive and paradoxical. Historian of science Lorraine Daston has referred to objects that similarly exist between art and science, including the glass flowers the Blaschkas later produced for Harvard

[1] Miranda Lowe, collections manager, Invertebrate Zoology Group, Aquatic Invertebrates Division, Department of Life Sciences, the Natural History Museum, personal email (30 Jan. 2014).
[2] The Blaschkas sold models within Germany and the UK, then eventually throughout Europe, Asia and North America. Henri Reiling, 'The Blaschkas' Glass Animal Models: Origins of Design', *Journal of Glass Studies* 40 (1998), 105.

University, as 'chimeras', composites of different 'species'.[3] The hybridity of the marine models, however, extends beyond their objecthood – caught between ornament and biology, spectacle and pedagogy – to the anatomy of the creatures themselves. In the nineteenth century, siphonophores, jellyfish, sea anemones, sponges and coral were still identified according to the seventeenth-century term 'zoophyte', meaning 'plant-animal'.[4] A newspaper writer stated that it is the 'marvellous zoophytes – the "plant animals" – which make the borderland between two great natural kingdoms so intensely interesting to the naturalist, so baffling in their problems to the philosopher, and so strikingly exhibited in the "Coral Gallery" at South Kensington'.[5] The writer responded to the displays in the Coral Gallery – including the Blaschka models – with astonishment:

> The mysteries of terrestrial life are profound enough, but they become simplicity itself when compared with the astonishing devices which Nature employs for even the first functions of existence, such as locomotion, feeding, and multiplication of species. There is no fancy so wild that it can exceed the realities of zoophyte life.[6]

The incredible realities of zoophytes may refer equally to the sexual fancies of marine invertebrates as to these animals, and the glass models, as objects of fancy. These creatures were known to reproduce through various means, both sexual – some possessing the reproductive capacities of both sexes – and asexual – as in the colonial mode of siphonophores. Previous research has considered the idiosyncrasies of the Blaschka models as artistic and scientific objects, but without examining how these relate to the perplexing sexuality of marine invertebrates, in light of the models' ambiguous position within material culture.[7] Late nineteenth-century evolutionary theory produced a hierarchy based

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[3] Lorraine Daston, ed., *Things That Talk: Object Lessons form Art and Science* (New York: Zone Books, 2004), 21. From 1887-1936 the Blaschkas were commissioned by Harvard University to produce the Ware Collection of Glass Models of Plants, which holds over 4,000 models. See 'The Glass Flowers', *Harvard Museum of Natural History* <http://hmnh.harvard.edu/glass-flowers> accessed 6 June 2015.

[4] The Natural History Museum continued to use the term in the early twentieth century. British Museum, *Guide to the Coral Gallery (Protozoa, Porifera or Sponges, Hydrozoa and Anthozoa in the Department of Zoology British Museum (Natural History)* (London: Trustees of the British Museum (Natural History), 1902), 40.

[5] 'Our Coral Gallery', *Daily Telegraph* (13 Jan. 1883), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

[6] 'Our Coral Gallery'.

[7] See *Historical Biology: An International Journal of Paleobiology*, special issue*:* Proceedings of the Dublin Blaschka Congress, 20.1 (2008); James Peto and Angie Hudson, eds, *Leopold and Rudolf Blaschka*, exh. cat. (London: Design Museum, 2002); Heidi Koch and Hans-Jürgen Koch, *Blaschka: Gläserne Geschöpfe des Meeres*, exh. cat. (Hamburg: Dölling and Galitz, 2007); Nigel Monahan, Julia Sigwart and Catherine McGuinness, *Blaschka Glass Models*, exh. cat. (Dublin: National Museum of Ireland, 2006); and Reiling, 'Blaschkas' Glass Animal Models', 105-26.

on sexual division, from such hermaphroditic and asexual animals at the bottom to humans, and specifically white Western man, at the top. Scarcely more sentient than plant life it was believed, marine invertebrates were regarded as being among the 'simplest animals' and lowest ranking on the evolutionary ladder.[8] However, the creatures were not merely evolutionary relics but also evolutionary keys – their shocking biology points towards radical social implications within evolutionary theory which philosopher Elizabeth Grosz argues hold far-reaching implications for feminist analysis.[9]

Meanwhile, as fetishised objects in late nineteenth-century art and design, the animals' role in the Blaschkas' output necessitates an investigation into the vicissitudes of representation, for both scientific and artistic purposes, and of the problems inherent within model making, especially given the specific materiality of glass and direct connections with other realms of production, such as jewellery making. Despite some writers' designations of 'specimens' or even 'reproductions', the translucent Blaschka models impede straightforward representationalism, which philosopher and quantum physicist Karen Barad criticises for imposing a metaphysical determinate distinction between subject and object, seer and seen, 'knower and known', where in fact these categories are mutually generative and based in matter.[10] Thus, in their blurring of objectivity and subjectivity, the glass marine invertebrates are exemplary models; Daston claims that models may be the most quintessential of 'things, those nodes at which matter and meaning intersect'.[11] In the material circumstances and meaning inferred from invertebrate anatomy within evolutionary theory and the corresponding glass models within contemporary display paradigms, these chimeras present a challenge to expectations of gender dynamics at the time of their creation and display in the Natural History Museum.

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[8] William Henry Flower, *A General Guide to the British Museum (Natural History)*, (London: British Museum (Natural History), 1886), 26.
[9] Elizabeth Grosz, *Time Travels: Feminism, Nature, Power* (Durham, NC: Duke University Press, 2005), 32.
[10] Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007), 133. C. Giles Miller and Miranda Lowe repeatedly refer to the models as 'specimens', but in the contemporary literature they are never referred to as such. Miller and Lowe, 'The Natural History Museum Blaschka Collections', *Historical Biology* 20.1 (2008), 51-62. Susan M. Rossi-Wilcox, Henri Reiling and Philip Bisaga refer to the models as 'glass reproductions of invertebrates'. Wilcox, Reiling and Bisaga, 'The Blaschkas' Lampworking Tables', *Journal of Glass Studies* 45 (2003), 167.
[11] Daston, *Things That Talk*, 16.

A Gallery of Wonders

In January 1883 the new Natural History Museum opened its Coral Gallery, two years following the opening of the new location in South Kensington and the beginning of the collections' relocation from Bloomsbury (fig. 3.2). Not limited to corals but encompassing jellyfish, siphonophores, sea anemones, sponges and protozoa – microorganisms including amoebae, heliozoa and radiolarians – the Gallery was one of the first of the zoological collections to open to the public in the new venue, along with the neighbouring Shell and Starfish Galleries. Large freestanding specimens of dried corals and sponges neighboured shelves of smaller wet specimens lined up in jars and wall-mounted didactic texts and images.[12] The displays seemed extraordinary to visitors. They included animals with names such as Venus' Flower Basket and Neptune's Goblet, which the Museum literature described as 'beautiful' and 'conspicuous'.[13] The *Daily Telegraph* called the Coral Gallery 'a puzzling accumulation of the most intricate wonders of the sea; a baffling, bewildering, drive-anyone-crazy collection of impossible things'.[14] It was here that the Blaschka glass models of marine invertebrates were displayed.

The accumulation of a range of Blaschka models over nearly a quarter of a century demonstrates how important they were deemed to the Museum's zoological collections. Representing the main span of the glassmakers' production of marine invertebrates, the collection's history is also intricately connected to the Blaschkas' model making career. The collection began in 1866, when the Museum purchased over eighty models of sea anemones, only a few years after Leopold Blaschka had begun to produce and market these.[15] While working for his family's commercial glassmaking business in the Bohemian Village of Aicha (now Český Dub, Czech Republic), which chiefly produced ornaments and glass eyes, he developed an interest in marine invertebrates. Following his young family's move to Dresden, some of the earliest anemone models were displayed in 'dry aquariums' in Dresden's natural history museum.[16] A decade after the initial order, the same year Leopold's son Rudolf joined the family business and the

[12] Flower with E. Ray Lankester, *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1906), 46.
[13] Flower, *General Guide* (1886), 30.
[14] 'Our Coral Gallery'.
[15] Miller and Lowe, 'The Natural History Museum Blaschka Collections', 57.
[16] Reiling, 'Blaschkas' Glass Animal Models', 106.

Blaschkas' repertoire consequently expanded, the Museum in London placed an order for models of sea slugs, a soft coral, a squid, an octopus and several jellyfish.[17] Finally in 1889, the last year of the Blaschkas' zoological output before they signed an exclusive contract to produce Harvard's collection of glass flowers in 1890, a set of microscopic organisms including radiolaria was ordered for the Coral Gallery.[18]

As part of the general movement of the period for museums to offer public enlightenment, the new Museum's epistemological purpose to facilitate the study of natural history by scholars and laypeople alike – evidenced by the division of the collections into a separate 'study-series' and 'exhibition-series' – rested on the ostensibly direct observation of its objects.[19] The use of models and other simulacra as surrogates for specimens was part of the widespread curatorial mission 'to objectify texts and textualize objects'.[20] Intended for public display, the Blaschka models were to communicate to the layperson that which was, according to the *General Guide*, 'enlarging the boundaries of knowledge' in the Museum's inner sanctum.[21] Although seen as mere substitutes or illustrative aids, they formidably fulfilled the Museum's ongoing objective of comprehensive representation, to achieve 'as complete an illustrative series … as possible'.[22] The models' function as exhibitionary stand-ins for specimens appears to have been taken as self-evident: there is only one mention of the glass models in the guide to the Coral Gallery, and no illustrations.[23] Only a single archival photograph of an example of the Blaschkas' work in the Natural History Museum – the *Physophora*

[17] Models of molluscs, such as sea slugs, squid and octopi, would have been kept in the nearby Shell and Starfish Gallery.
[18] Miller and Lowe, 'The Natural History Museum Blaschka Collections', 58.
[19] Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995), 28; Albert Günther, *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 2: *Separate Historical Accounts of the Several Collections Included in the Department of Zoology* (London: British Museum (Natural History), 1906), appendix, 2.
[20] Barbara Kirshenblatt-Gimblett, *Destination Culture: Tourism, Museums, and Heritage* (Berkeley: University of California Press, 1998), 31, quoted in Geoffrey Swinney, 'Enchanted Invertebrates: Blaschka Models and Other Simulacra in National Museums Scotland', *Historical Biology* 20.1 (2008), 39.
[21] Flower, 19. Although Blaschka models were purchased extensively by postsecondary institutions, there is little evidence that the models served professional scientific study in museums. For more on the Blaschka models' educational uses, see Ruthanna Dyer, 'Learning Through Glass: The Blaschka Marine Models in North American Post Secondary Education', *Historical Biology* 20.1 (2008), 29-37; and Miranda Lowe and C. Giles Miller, 'A Scientific Perspective on the Acquisition and Display of the Natural History Museum Blaschka Collections', in *Art Forms from the Ocean*, exh. cat. (Sunderland UK: National Glass Centre, 2008), 17.
[22] Flower, *General Guide* (1886), 15-16.
[23] British Museum, *Guide to the Coral Gallery*, 54.

hydrostatica – exists (fig. 3.3).[24] Thus while like taxidermy they represented a paradox in that the more skilful the craft of the model the more invisible it became, nevertheless as 'copies' their status appears to have been ranked secondary – unlike taxidermised animals they could never be the thing itself.

The common explanation given for why the Blaschkas exclusively produced models of certain invertebrates for so many years was that, soft-bodied and aquatic, the animals to which they corresponded were some of the most difficult to preserve.[25] Traditionally jarred in aseptic fluids, this method of preservation was not ideal for such delicate, ethereal bodies: the alcohol bleaches and distorts their tissues, resulting in opaque, rubbery specimens that literally bear a pale resemblance to the living creatures (fig. 3.4, 3.5).[26] In a rare mention of the marine invertebrate models, keeper of zoology Albert Günther wrote: 'Unfortunately, the colours of these beautiful creatures cannot be preserved after death and therefore a small series of glass models is exhibited, which give some idea of their great variety in form and colouring.'[27] Much as the taxidermist constructs a model in an attempt to recreate an animal in action, the Blaschkas rendered the underwater creatures – elusive in both life and death – lifelike in pose and colour, with every detail of their visible morphology on display. For example the Museum's model of the Portuguese man-of-war, a well-known siphonophore notorious for its dangerous sting, conveys the cloudy translucency of the colony's swimming bell and the flamboyant flourish of its blue-violet polyps with an immediacy that is unmatched by a wet specimen (fig. 3.6). With respect to their visibility then, the models became more valuable museum objects than the animals themselves, regardless of whether they were acknowledged as such.

And yet by overlooking the specifics of their manufacture and materiality, this explanation risks reiterating the Blaschka models' nineteenth-century status

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[24] Miller and Lowe point out that no photos show definitive evidence of the Blaschka models on display. Miller and Lowe, 'A Scientific Perspective', 10.
[25] Dyer, 31.
[26] Monahan, Sigwart and McGuinness, 4. Other reasons against spirit collections were that they required more maintenance, were potentially dangerous fire hazards and may have been more expensive than the models. Dyer, 34. Also see Petra Lange-Berndt, 'Unheimliche(s) Gestalten. Damien Hirsts Naturgeschichte und das historische Verfahren der Naßpräparation', in Andreas Haus, Franck Hofmann and Änne Söll, eds, *Material im Prozess. Strategien ästhetischer Produktion* (Berlin, Reimer, Dietrich: 2000), 167-80, and Lange-Berndt, *Animal Art: Präparierte Tiere in der Kunst, 1850 – 2000* (Munich: Silke Schreiber, 2009), 193.
[27] Günther, *Guide to the Shell and Starfish Galleries (Mollusca, Echinodermata, Vermes) in the Department of Zoology of the British Museum (Natural History)* (London: Trustees of the British Museum (Natural History), 1887), 28.

as copies. This elision of the model making process is echoed in recent photography that fetishises the dazzling illusionism of the models at the expense of their objecthood. Dramatic and selective angles which erase the contexts of display (aided by the recent additions of stands) emphasise precision of construction and anatomical faithfulness but belie both scale and finish (figs 3.7, 3.8). In contrast with their sleek scalelessness in punchy colour photographs, encountered on display the models appear extraordinarily fragile and surprisingly diminutive (fig. 3.9).[28] In glass cases, on glass shelves, with no electric lighting, they would have been impressive in their intricacy and illusionism, but subtle in their translucency and slightness, more treasures to be discovered than dramatic spectacles.

The original display of the Blaschka models in the Natural History Museum requires reconstruction from what little textual and photographic documentation remains. In contrast with their former lodgings in the British Museum in Bloomsbury, where specimens were scattered and overcrowded and 'lower animals' were squeezed into cases where available, the collections were well organised in the spacious new Coral Gallery.[29] The *Daily Telegraph* reviewer's baffled response to the gallery containing 'everything between starfish and infusoria', resulting in a level of diversity that 'transcends expectations of the viewer', is particularly notable for the contrast it reveals with the nearby Shell and Starfish Galleries.[30] These had historically received unapologetic precedence over the Coral Gallery, benefitting from numerous major donations and acquisitions throughout the 1860s and 70s;[31] in their former location in Bloomsbury, they received ample space and complete, systematic arrangement.[32] In the new Museum, the two galleries featured very different display systems, despite being

[28] Several institutions have recently exhibited collections of the Blaschka models according to more or less Victorian display styles, including the Redpath Museum, McGill University, Montreal, in its exhibition *Nature in Glass: The Blaschka Glass Models* (2010), and Cornell University's permanent exhibitions at Mann Library and Corson Mudd Hall, Ithaca, NY. The Natural History Museum currently has a collection of models as part of a rotating display in the Treasures Cadogan Gallery. Several recent contemporary art exhibitions have also included Blaschka models, including *Rosemarie Trockel: A Cosmos* at the New Museum, New York, and Serpentine Gallery, London (2012-13), *Aquatopia* at Nottingham Contemporary and Tate St. Ives (2013-14) and *Curiosity: Art and the Pleasures of Knowing* at Turner Contemporary, Margate, and other venues (2013-14).
[29] Günther, *History of the Collections*, vol. 2, 3.
[30] 'Our Coral Gallery'.
[31] For details of donations, see Günther, *History of the Collections*, 19, 23, 28.
[32] Günther, *History of the Collections*, vol. 2, 2-3. By contrast, Günther claimed that the coral collection had never received proper treatment until the new gallery was planned. Günther, *History of the Collections*, 32.

opened simultaneously. While the shell collections received a more traditional taxonomic arrangement, primarily displayed in uniform glass-covered table cases, the vitrines containing corals and their ilk were variously shaped, upright and interspersed throughout the room (figs 3.10, 3.11) – the contrast can be likened to the Pavilion's distinction from the main Mineral Gallery.

Compared with the horizontal regularity of the Shell and Starfish Galleries, the Coral Gallery's startlingly diverse specimens and displays created an immersive, almost sculptural atmosphere. Nevertheless, the *Telegraph* writer claimed:

> [I]f one pays attention to the intention of the exhibition, order at once supplants chaos. The beautiful contents of this unique gallery fall into a symmetrical sequence, and wonder grows out of wonder, graduated with a mysterious subtlety all down the line.[33]

While transcending the early natural history fixation on taxonomy, the Coral Gallery's symmetrical but variegated wonders also speak to the earlier fascination of natural philosophy with the rare and marvellous, as in the cabinet of curiosity or *wunderkammer* predecessor of the museum.[34] The displays' distinctive organisation and resulting sense of wonder and mystery complementing their 'bewildering' contents suggest that the objects in the Coral Gallery were more than textual; they affected a resonance beyond illustrations or stand-ins, whether taxonomical or evolutionary.

Gendering the Sea

The creatures of the deep were only recently coming to light. In the early 1850s, a damaged cross-continental telegraph cable was famously dredged up along with numerous animals from the seabed, dispelling previous notions that the ocean's depths were lifeless.[35] While earlier scientific expeditions had chiefly served to sound the exact depths of the sea, the *HMS Challenger* expedition of 1872-76 produced thousands of new species from hundreds of locations, laying the

[33] 'Our Coral Gallery'.
[34] Stephen Greenblatt, 'Resonance and Wonder', in Ivan Karp and Steven D. Lavine, eds, *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington, DC: Smithsonian, 1991), 50.
[35] Bernd Brunner, *The Ocean at Home: An Illustrated History of the Aquarium* (New York: Princeton, 2003), 12.

foundations for modern oceanography.[36] Reports from such expeditions ignited the public imagination. Where the sea had formerly been perceived as a dangerous and repulsive wasteland, increased ocean travel and emigration by the midcentury, combined with belief in the curative powers of seawater and salty air had helped to promote the sea as a popular destination.[37] By the 1850s, seaside collecting had become a well-loved middleclass pastime, to which the British Museum had evidently responded by allocating its finest and best-lit galleries to its shell collections – Günther acknowledged the objective to satisfy 'not only the casual visitor, but also the large class of collectors who pay frequent visits to the gallery with the object of comparing their unnamed specimens with those in the gallery'.[38]

Such was the background of the subsequent 'aquarium craze' that had coincided with the increasing awareness of deep-sea life and to which the new Coral Gallery and the Blaschka models clearly responded. In addition to the prolific discovery of aquatic creatures, the popularity of public and private aquariums during the 1850s-60s corresponded to the newly inexpensive availability of sheet glass and the enthusiastic coaxing of the public to explore and collect the 'wonders' of the shore and deep sea by writers such as Philip Henry Gosse, Charles Kingsley and George Henry Lewes.[39] The evocative writing on marine life and accompanying lush illustrations by Gosse, who coined the term aquarium, had particular influence on the craze.[40] He connected seaside collecting to the lesser known creatures of the deep sea:

> We can scarcely poke and pry for an hour among the rocks at low-water mark, or walk with an observant downcast eye along the beach after a gale, without finding some oddly-fashioned, suspicious-looking being, unlike any form of life that we have seen before. The dark, concealed interior of the sea becomes thus invested with a fresh mystery; its vast recesses appear to be stored with all imaginable forms, and we are tempted to think there must be multitudes of living creatures whose very figure and structure have never yet been suspected.[41]

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[36] Brunner, 14.
[37] Alain Corbin, *The Lure of the Sea: The Discovery of the Seaside in the Western World 1750-1840*, trans. Jocelyn Phelps (Cambridge: Cambridge University Press, 1994), 1-18, 57.
[38] Günther, *History of the Collections*, vol. 2, 2, 3.
[39] See Philip Henry Gosse, *The Aquarium: An Unveiling of the Wonders of the Deep Sea* (London: Van Voorst, 1854); Charles Kingsley, *Glaucus; Or, the Wonders of the Shore*. 3rd edn (Cambridge: MacMillan and Co., 1856); and George Henry Lewes, *Sea-Side Studies*, (Edinburgh: Blackwood, 1858).
[40] According to Gosse, aquarium was more specific than vivarium and neater than aqua-vivarium, Gosse, *The Aquarium*, 256.
[41] Gosse, *The Aquarium*, 227.

Like the newspaper review of the Coral Gallery, Gosse emphasised the intriguing otherness of the mysterious beings of the deep.

As in other areas of popular natural history collecting – for instance, ferns, fossils, seaweed and shells – bourgeois women were at the forefront of the aquarium craze, and beachcombing as a lady's pursuit was encouraged as morally virtuous, if also ridiculed.[42] In a somewhat risqué *Harper's Weekly* cartoon of 1858, the seashore's 'Curious Objects' to which the caption refers are in fact middleclass women, stooping to examine what the tide brought in, the endless vista of upturned bottoms shrouded in petticoats and bloomers suggestive of oyster shells or jellyfish and their allusions to female sexuality (fig. 3.12).[43] Although a few men appear in the image, their staid dark trousers and coats distinguish them from their female counterparts, while the appearance of an arm and specimen nets prevents their dehumanisation. The image suggests a perceived frivolous hysteria on the part of female collectors that matched the trifling status of their favoured specimens.

The transfer of popular and scientific interest from the ocean's flat littoral zone to its unfathomable depths echoes the contrast between the Shell and Starfish Gallery's traditional taxonomic and horizontal arrangement and the startlingly immersive atmosphere of the Coral Gallery, which in turn reflects a paradigmatic shift from the emphasis on taxonomy in earlier natural history to new modes of looking and thinking through nature and biology within evolutionary models. This transition is frequently understood as occasioning the professionalisation of scientific methods that coincided with advanced methods of gathering and examining specimens and resulted in reduced access to laypeople, including female collectors. Historian Helen Rozwadowski writes that while women partook in yachting excursions to collect marine specimens, this type of amateur practice was soon displaced by the use of cable ships to study the sea, as part of the

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[42] Gosse includes an entire chapter on piety and natural history. Gosse, *The Aquarium*, 204-10. Kingsley wrote of the spiritual value of natural history collecting, recommending it for young boys at risk of growing up effeminate but also for young women to maintain their virtue: 'I have seen the young London beauty, amid all the excitement and temptation of luxury and flattery, with her heart pure and her mind occupied in a boudoir full of shells and fossils, flowers and sea-weeds, and keeping herself unspotted from the world, by considering the lilies of the field, how they grow.' Kingsley, 43, 47.

[43] The connection of marine invertebrates with female genitalia goes back at least as far as Linnaeus, who named the 'sea mouse' *Aphrodite aculeata* after the Greek goddess of love as a dirty joke – even its vernacular name hails from traditional Northern European slang for vulva. Sue Hubbell, *Waiting for Aphrodite: Journeys Into the Time Before Bones* (New York: Houghton Mifflin, 1999), 222.

mounting professionalisation of science.[44] Analogously, in his history of the aquarium Bernd Brunner connects the wane of the aquarium craze to the obsolescence of Gosse and others' natural theology in the face of Darwinian evolution.[45]

However, from the 1860s to the 1880s, distinctions between amateur and professional practices as well as between religious and secular science were not always clearly defined.[46] That scientists aboard the *Challenger* included drawings of mermaids among their reports demonstrates an overlap of early oceanography with fantasy that complicates straightforward readings of the displacement following Darwin of an earlier natural history order (fig. 3.13). The mermaids' playful assistance – or perhaps teasing obstruction – of the scientists' dredging suggests the hold the mysteries of the deep maintained on the scientific imagination.

The Blaschkas, with their origins in Bohemian craft tradition and commissions from scientists and scientific institutions, likewise demonstrate a breakdown of divisions between amateur and professional practice, as well as art and science. By the later decades of the century, marine invertebrates had become formidable aesthetic objects. In his various publications on the life of the sea, Gosse waxed eloquently on the vivid beauty of the creatures of his study: the poisonous Portuguese man-of-war the Blaschkas modelled was itself 'a beautiful object; the glossy, colourless bladder reflecting the sun's rays, while the upper half of the sail is tinged with a delicate rose-colour, and the bottom of the bladder with a rich azure'.[47] He even aestheticised the reproductive organs in the 'lovely little coral-bead Medusa … the ovaries being orange or pale scarlet, studded with proportionally large ova, of a rich purple hue.'[48]

Such animals became influential to industrial design, just as they drew comparisons to items within material culture: while Gosse repeatedly compared the 'brilliant little sphere' of the medusa to glass, even naming one species *Aequorea vitrina*, or 'glassy aequorea', he equally commented on the blatant

[44] Helen M. Rozwadowski, *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea* (Cambridge, MA: Harvard University Press, 2005), 131-32.
[45] Brunner, 58.
[46] Bernard Lightman points out that the age of scientific professionalisation spearheaded by T.H. Huxley and others was coincided by an age of scientific popularisation, largely by natural theologians. Lightman, 'The Visual Theology of Victorian Popularizers of Science: From Reverent Eye to Chemical Retina', *Isis* 91.4 (Dec. 2000), 652-53.
[47] Gosse, *Life In Its Lower, Intermediate, and Higher Forms: Or, Manifestations of the Divine Wisdom in the Natural History of Animals* (London: Van Voorst, 1857), 89.
[48] Gosse, *Life In Its Lower, Intermediate, and Higher Forms*, 84.

resemblance between the 'elegant forms' of modern street lamps and 'certain living creatures that swim in the vast deep'.[49] As early as 1857 he wrote, 'The forms given to our lamp-shades, – spherical, hemispherical, umbrella-like, saucer-like, spheroids either oblate or prolate, and others which no single or compound term can express, – are the very counterparts of those of the sea-blubbers.'[50] These diaphanous forms and their increasingly patent influence by marine animals reached their height in Art Nouveau of the late century. The designer Émile Gallé made plain the interchange between zoologists, model makers and artists:

> These secrets of the Ocean are brought forth to us by brave deep-sea divers. They empty their marine harvest which passes from the laboratory to the studios of decorative art and to the museums of models. They draw and publish these undreamt-of materials for the artist: enamels and cameos from the sea. And soon, crystalline jelly-fish will inspire new shadings and original curves in chalices of glass.[51]

Gallé's own glass vases with their layered films, mottled surfaces and interplay of opacity and translucence featured sea life while biomorphically imitating its forms (figs 3.14, 3.15). He achieved these effects with his technique of 'patina' he patented in 1898, which incorporated ashes, bubbles and sooty surface films normally seen as imperfections in a deliberate decorative manner.[52]

Gallé's work, at once murky and ethereal, seems to illustrate the mysteries of the sea Jules Michelet described in his book *La Mer* of 1861.[53] Michelet's 'erotically charged' opus on the sea and its more elusive inhabitants combined natural history – Michelet was an evolutionist – with history and myth.[54] On invertebrates he wrote, 'A class? nay, they are a world; an abyss of soft and semi-organized life to which was still wanting the vertebra, the osseous centralization, and the essential framework of the personality.'[55] He compared certain 'daughters of the Sea' to 'great crystal lustres with sparkling diamond drops', bringing to mind the cascades of glass droplets emanating from various Blaschka models such

[49] Gosse, *The Aquarium*, 156; Gosse, *A Naturalist's Rambles on the Devonshire Coast* (London: Van Voorst, 1853), 341; Gosse, *Life In Its Lower, Intermediate, and Higher Forms*, 76.
[50] Gosse, *Life In Its Lower, Intermediate, and Higher Forms*, 77.
[51] Émile Gallé, *Écrits pour l'art* (Paris: Laurens, 1908), 224-25, quoted in William Warmus, *Emile Gallé: Dreams Into Glass*, exh. cat. (Corning, NY: Corning Museum of Glass, 1984), 24.
[52] Warmus, 24.
[53] First translated into English in 1875.
[54] Ludmilla Jordanova, *Sexual Visions: Images of Gender in Science and Medicine Between the Eighteenth and Twentieth Centuries* (Madison, WI: University of Wisconsin Press, 1989), 85.
[55] Jules Michelet, *The Sea*, trans. W.H. Davenport Adams (London: T. Nelson & Sons, 1875), 119.

as the *Physophora hydrostatica*.[56] In one section of *La Mer*, Michelet describes an encounter with a beached medusa:

> This one was very little, about the size of my hand, but singularly pretty, with soft bright tints. It was of an opaline white, in which was merged, as in a cloud, a crown of tender lilac … It trembled and shuddered throughout its poor body, for it was wounded, and those subtle filaments were torn, which are its organs of respiration, absorption, and even of love.

Eventually, the author resolves to save the animal, and admits,

> If I must tell the truth, it was with some repugnance I touched it. The delicious creature, with its visible innocency and the iris of its soft colours, was like a trembling jelly, – it glided from my hands, and escaped my grasp.[57]

This sensual account of the 'delicious creature' conjures foodstuff, analogous to John Ruskin's employment of sweets, butter, milk and honey for elucidating mineralogy.[58] And yet the narrative also verges on an illicit sexual encounter, desirous but not without trepidation.

Michelet patently gendered the ocean feminine. He called the sea 'the great female of the globe, whose indefatigable desire, permanent conception, and prolific birth never cease'; he connected seawater with mother's milk, the tides with menstruation.[59] However, the properties he bestowed onto the life contained within the ocean, while similarly erotic, suggest a more ambiguous, pre-differentiated sexuality. On 'infusoria', a nineteenth-century term for microscopic aquatic animals, he wrote, 'The ocean plants and animals are covered with this substance, whose mucosity, consolidated around them, has a gelatinous effect, sometimes fixed, and sometimes wavering. They appear through it as through a diaphanous veil.' Of this 'mucus of the sea' he asked, 'Is it not the universal element of life?'[60] For Michelet, this 'generative membrane', combined with some marine organisms' ability to procreate asexually, was evidence of nature's miracle. Almost prophetically, he appealed for artists to take up such animals and

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[56] Michelet, 129, 130.
[57] Michelet, 128-29.
[58] Gosse went a step further in his descriptions of cooking sea anemones. Through a detailed trial and error, he deduces that ten minutes of boiling is to ideal taste as well as an 'inviting appearance' but that they are even better fried and all in all 'far superior to cockles, periwinkles, and mussels'. He elaborates, 'The internal parts, including the ovaries and the tentacles, though from their mottled appearance rather repelling to the eye, were the most agreeable in taste; the integuments somewhat reminded me of the jelly-like skin of a calf's head.' Gosse, *A Naturalist's Rambles*, 152.
[59] Michelet, 91, 86.
[60] Michelet, 92-93.

their ‘puissant virtues of fecundity’, a call that was answered by Gallé and many others.[61]

Ultimately, such creatures assumed poetic resonance in natural theological and evolutionary discourse alike, as seen in Gosse and Michelet, respectively. Their pre-differentiated, primaeval significance bore mysterious import. In response to the Coral Gallery, the *Daily Telegraph* writer queried, ‘What is the meaning of all this profligacy of exquisite shape and colour, this extravagant variety of form, this bewildering ingenuity of organism, down at the bottom of the sea?’ and on the Blaschka models, ‘Observe these models in glass of some of the Medusae. What is the meaning of all this exquisite colouring, this surpassing grace of form?’.[62] Michelet linked the world of marine invertebrates to a universally transcendent enigma that resonated deeply with the human condition:

> [T]he noble and beautiful medusas – like the crowned Oceania, like the charming Dionaea – seem the expression of graver thoughts. The luminous hairs beneath their body, like the gloomy lamp of one who watches, emit mysterious flashes of emerald and other colours, which, whether sparkling or waning, reveal a sentiment and an undefinable mystery. One would say it is the spirit of the abyss meditating over its secrets. Or the soul which has lived, or is some day to live. Or rather, must we not see in it the melancholy dream of an impossible destiny which will never attain its goal? Or the call to happiness of love which alone consoles us here below?[63]

Gallé’s last known work, a virtuosic glass hand, whose ghostly transparent fingers emerge covered in seaweed and shells out of the sea’s evolutionary primaeval soup, or generative ‘mucous’, epitomises Michelet’s existential sentiment (fig. 3.16). And yet so do the crystalline, enigmatic Blaschka models of creatures like those described by Michelet. Moreover, the author’s rhetoric also resonates with the Blaschka models’ well-known origin story: according to popular account Leopold’s initial ‘inspiration’ came during a sea voyage in 1853 following the deaths of his first wife and father. Becalmed for several weeks, he drew jellyfish found in the surrounding waters.[64] This melancholic tale signals the evocative nature of the creatures that captured the late nineteenth-century imagination.

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[61] Michelet, 99.
[62] ‘Our Coral Gallery’.
[63] Michelet, 136.
[64] Chris Meechan and Henri Reiling. ‘Leopold and Rudolf Blaschka and Natural History in the Nineteenth Century’, in Peto and Hudson, 13.

However, such romantic associations contrast with the Blaschkas' own self-conception. Lorraine Daston and Peter Galison write that objectivity as a scientific ideal was established during the mid-nineteenth century and manifested itself in scientific imagery – that concerned with 'purity of observation' including flaws and imperfections. Objective scientific imagery was placed in direct opposition to the subjectivity that increasingly came to distinguish art.[65] Although an early Blaschka catalogue labelled the marine models, with their connections to fine glass jewellery and decorative objects, 'ornaments for elegant living rooms', in 1877 Leopold stated that their catalogue was now 'restricted only to scientific models'.[66] The Blaschkas' intent on scientific objectivity is evident in their consistent use of animals' Latin names.[67]

This transition in the purposing of their output is evidenced by the diversification of the Blaschkas' sources, as they endeavoured to produce increasingly sophisticated invertebrate models. Leopold's early sea anemone models were based exclusively on the illustrations of Philip Henry Gosse.[68] The naturalist's colourful oceanic caves teeming with various species of anemones communicate the animals' beauty and variety as true to natural theological vision (fig. 3.17). Whether modelled in groups or in isolation, Blaschka's early anemones such as the *Bunodes Balli* (c. 1866) appear at once as contextualised against their painted settings and as solid, self-contained organisms, firmly rooted to individual plaster bases (fig. 3.18). They mimic Gosse's exuberant, almost anthropomorphic vision and its emphasis on different species as manifestations of the uniqueness of God's creation, as well as taxonomy based on outward appearances.[69] Surprisingly primitive looking preparatory drawings for such models demonstrate the portioning off of chunks of nature and their respective specimens into flattened sections, in the process of adapting Gosse's drawings to

[65] Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), 161, 75.
[66] 'Als Zierde fur elegante Zimmer'. Leopold Blaschka, *Blaschka Catalogue* (c. 1870), enclosed in Leopold Blaschka, letter to Albert Günther (11 Nov. 1875), NHM Archives; Leopold Blaschka, letter to Ernst Haeckel (1877), cited in Reiling, 'The Blaschkas' Glass Animal Models', 112.
[67] Julia Sigwart, 'Crystal Creatures: Context for the Dublin Blaschka Congress', *Historical Biology* 20.1 (2008), 7.
[68] Reiling, 'Blaschkas' Glass Animal Models', 106.
[69] For more on the communication of natural theology through illustration, see Lightman, 651-80.

the glass models (fig. 3.19).[70]

Once Rudolf joined Leopold in 1876, expanding their business to include a variety of complex marine invertebrate models, including siphonophores, jellyfish, squid, octopi, sea slugs, molluscs and eventually protozoa and enlarged anatomical dissections, the Blaschkas began to vary their sources. One of the key figures they turned to for scientific illustrations was Ernst Haeckel. The German zoologist is particularly notable for his work on marine invertebrates: he described approximately 4,000 new species, contributed four volumes to the *Challenger* expedition report and produced key monographs on medusae, radiolaria and siphonophora. These became central to his attempts to reconstruct evolutionary history.[71] Haeckel is renowned equally for popularising Darwin's theory of natural selection as for his lavishly intricate drawings of siphonophores and related sea creatures – most famously in his 1899-1904 publication *Kunstformen der Natur* – whose arabesque lines and decorative symmetry heavily influenced art and design movements of the late nineteenth century (fig. 3.20).[72] In strong contrast to Gosse's vivid illustrations of discrete underwater life forms coexisting in harmony, Haeckel's highly stylised drawings map out steps in evolution, according to his own innovative and idiosyncratic system. Here marine invertebrate anatomy is dissected, then schematised into patterns. There is no indication of environment, only the animals' composite structures, transformed into elaborate, highly symmetrical dynamic forms. The organisms and their anatomy become principles, more diagrammatical than biological, stripped of their fleshy and earthly associations.

Haeckel's crystalline aesthetic is intricately connected to his unique vision of evolutionary theory. Although distinctly against creationist versions of natural history, his biographer Robert J. Richards writes that for Haeckel, Darwin's theory of evolution became like a religious calling.[73] Nevertheless, he has been labelled a pseudo-Darwinist.[74] Art historian Marsha Morton explains:

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[70] It appears that Rudolf was the driving force behind the diversification of the Blaschkas' output, having studied natural history. Miranda Lowe, personal communication (28 Apr. 2015). Based on Leopold's early drawings and models, it also appears he may have been the more skilful artist.
[71] Marsha Morton, 'From Monera to Man: Ernst Haeckel, *Darwinismus*, and Nineteenth-Century German Art', in Barbara Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 63.
[72] See Morton, 59-91.
[73] Robert J. Richards, *The Tragic Sense of Life: Ernst Haeckel and the Struggle Over Evolutionary Thought* (Chicago: University of Chicago Press, 2008), 9.
[74] Morton, 85 n. 13.

> Despite Haeckel's lifelong role as Darwin's self-appointed champion, he promoted a theory from which the random, undirected, and open-ended were ironed out in favor of a generally optimistic view of a harmonious universe governed by regular laws that evolved progressively towards greater order, beauty, and self-perfection.[75]

Haeckel contextualised evolution within the Germanic tradition of romantic naturalism, his stylised approach to representing biology harking back to a Goethean aesthetics of nature concerned with core essences.[76] Out of this combination of influences he developed his belief in Monism: the idea that God and nature are one, and that such dualistic oppositions, as well as between organic and inorganic, are superficial.[77] To Haeckel, the overriding unity of nature meant that all things – from humans to jellyfish to stones – are '*equally animated*'.[78] His model for the classification of organic forms was in fact based in crystallography[79] – his crystallisation of life creates an interesting evolutionary counterpoint to Ruskin's animation of stones. Hence, he saw evolution as emerging out of symmetry and was interested in representing 'low' invertebrates because they could more readily be represented as symmetrical.[80] For Haeckel symmetry was order made visible; it encapsulated his Monistic view of the universe.

The contrast between Gosse's intact, contained sea creatures and Haeckel's dissected, blown-apart specimens echoes an explosion of an earlier religious natural history taxonomy into the complex interwoven layers of evolution, as well as the transition from popular seaside collecting to scientific deep sea dredging, as reflected by the divergent display models of the flat and orderly Shell and Starfish Gallery and the semi-chaotic Coral Gallery, with its varied, three-dimensional displays that facilitated both looking into and looking through. The trajectory of the Blaschka models appears to mimic this paradigm shift according to the glassmakers' increasing pursuit of scientific objectivity. Compared to the earthbound anemones, the Blaschkas' jellyfish and siphonophores of the 1870s appear weightless and refined – ethereal even. Rather

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[75] Morton, 62.
[76] Olaf Breidbach, *Visions of Nature: The Art and Science of Ernst Haeckel* (Munich: Prestel, 2006), 101.
[77] Mario A. di Gregorio, *From Here to Eternity: Ernst Haeckel and Scientific Faith* (Gottingen: Vandenhoeck & Ruprecht, 2005), 198.
[78] Ernst Haeckel, *The Natural History of Creation: Or the Development of the Earth and Its Inhabitants by the Action of Natural Causes*, vol. 1, trans. E . Ray Lankester (London: King, 1876), 22-23. Emphasis in original.
[79] Breidbach, 111-12. Also see Haeckel, 'Crystal Souls' (1917), *Forma*, special issue, 14.1-2 (1999), 1-204.
[80] Breidbach, 105, 231.

than illustrating the earlier concept of the vegetative zoophyte, they seem to correspond to Haeckel's vision of sea creatures as 'organic crystallisations'.[81] Preparatory drawings for models such as the *Physophora hydrostatica* demonstrate an increasing concern for dynamism of movement and interior anatomy, while their consideration for different angles of the external appearance of a creature are reflected in these later models (figs 3.21, 3.22).

But just as scientific objectivity is a historical phenomenon, the changes that transpire in the Blaschkas' output are more complex than simply increased naturalism or scientific sophistication. By the late 1870s the Blaschkas had begun to work from the live and preserved animals themselves; however, they continued to base most models on scientific drawings.[82] This is presumably because the drawings imparted information the Blaschkas could not ascertain from the animals alone, again debunking the idea that the models were mere copies. By this point the glassmakers were working from drawings by a variety of naturalists, not just Haeckel. That the later Blaschka models – and drawings – show clear differentiation from Haeckel's illustrations was likely intentional. Even though the Blaschkas were acquainted and maybe even friends with Haeckel,[83] they must have recognised – and been wary of – Haeckel's liberal stylisations. The anatomist's unorthodox method of elaborating artistic form to demonstrate scientific theory blurred the increasingly imperative opposition between subjective art and objective science; consequently, he appeared controversial, 'an artist in scientist's clothing'.[84] Unlike the earlier anemones, which appear as Gosse's drawings made three-dimensional, the later models diverge considerably from Haeckel: notably, they avoid his characteristic symmetry. The association of symmetry with the wondrous – as in the arrangement of the Coral Gallery – suggested an earlier order imposed on nature from which the new science of objectivity had to define itself.[85] As they endeavoured to distinguish themselves as scientific model makers, the Blaschkas might have eschewed Haeckel's idealism and the romantic tradition whence it originated.

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[81] Breidbach, 106.
[82] Meechan and Reiling, 19. When, in 1877, Leopold ordered preserved specimens from the Naples Zoological Station he claimed he needed them in order to check his scientific drawings. Reiling, 'The Blaschkas' Glass Animal Models', 119.
[83] Reiling, 'The Blaschkas' Glass Animal Models', 111.
[84] Daston and Galison, 247. For more on the controversy over Haeckel's use of images, see Nick Hopwood, 'Pictures of Evolution and Charges of Fraud: Ernst Haeckel's Embryological Illustrations', *Isis* 97 (2006), 260-301.
[85] Daston and Galison, 16.

The range of Blaschka models on display and their arrangement in the Coral Gallery thus corresponded to multifarious notions concerning evolution. The animals modelled by the Blaschkas had played an integral role in developing evolutionary theories throughout the century. As early as 1809 Lamarck had claimed that invertebrates were the key to understanding how all 'higher' forms had evolved. By the mid-1840s the Danish naturalist Japetus Steenstrup had published his findings on the reproductive modes of marine invertebrates, controversially demonstrating how extensive asexual reproduction – through splitting, budding and self-fertilisation – was among ocean life. And in his widely popular (albeit disputed) *Vestiges of the Natural History of Creation*, first published in 1844, Robert Chambers suggested descent from sea animals.[86] However, it was Charles Darwin who made the most dramatic discovery regarding the sex life of marine invertebrates, with his extensive research on barnacles.[87] His study of a contemporary species of hermaphrodite barnacles, which exhibited both atrophying male organs and rudimentary dwarf males attached to them – males in the process of emerging as a separate sex – enabled him to witness the evolutionary process in action. Barnacles thus were fundamental to Darwin's theory of natural selection, in particular his argument for the greater advantage of sexual division in *On the Origin of Species*.[88]

Against this background of discovery, visitors to the Coral Gallery learned about the diverse details of invertebrate anatomy. The *Guide to the Coral Gallery* provided detailed descriptions of marine invertebrates' processes of reproduction, for example those of the *Physophora hydrostatica*:

> [A] hollow stem or siphon is provided at its upper end with a small air-sac, below which follows series of swimming bells, medusa-like individuals, each consisting simply of an umbrella, and adapted solely for swimming; next follows a whorl of leaf-like 'covering-pieces', and below this a cluster

[86] Rebecca Stott, *Darwin and the Barnacle* (London: Faber and Faber, 2003), xxiii.
[87] Charles Darwin, *Living Cirripedia, A monograph on the sub-class Cirripedia, with figures of all the species. The Lepadidæ; or, pedunculated cirripedes*, vols 1-2 (London: Ray Society, 1851-1854). For recent analyses of the social implications of this research, see Stott, *Darwin and the Barnacle*; Elizabeth Grosz, *Becoming Undone: Darwinian Reflections on Life, Politics, and Art* (Durham, NC: Duke University Press, 2011), 162-65; and Elizabeth A. Wilson, 'Biologically Inspired Feminism: Response to Helen Keane and Marsha Rosengarten, "On the Biology of Sexed Subjects"', *Australian Feminist Studies* 17.39 (2002), 283-85. Wilson, an Australian feminist theorist and historian of science, is not to be confused with the British feminist scholar Elizabeth Wilson quoted in my introduction.
[88] Darwin, *On the Origin of Species* (1859), ed. Jim Endersby (Cambridge: Cambridge University Press, 2009), 79-80.

> of medusa-like generative polyps, tentacle-like polyps and short-stalked feeding polyps, each of the last having attached to its stalk a long tentacle armed with thread-cells.[89]

This understanding of siphonophores as comprising numerous organisms, rather than organs, had only recently been established.[90] It was surely with the type of technical explanation found in the guide in mind that the *Daily Telegraph* writer described the 'mysteries and marvels' of colonial reproduction by jellyfish and siphonophores as the ultimate example of the 'wild' realities of life under the sea:

> Pieces of their bodies leave them and, although they are only pieces, become the parents of creatures like their own originals. Thousands collect together into colonies, and assume the most exquisite vegetable forms, co-operating in the most marvellous fashion to make the complete imitation as exact as possible. Some are content to be the stalk, others are the flowers, and others are the buds. They develop a family, float and hang like a bunch of threads from the underside of it, distributing the functions of life amongst themselves with the most amazing unselfishness.[91]

The author slides from vegetative 'zoophyte' associations toward an anthropomorphic family unit. Perplexed, he strains to find a connection between asexual invertebrate reproduction and domestic Victorian existence. He uses mammalian household pets as an example:

> The cat that sate down on the hearthrug would gradually develop a multitude of legs and absorb its own head till it looked like a furry crab … Or, supposing our beasts and birds, instead of being complete, each individual in itself, had to live in companies in order to exist? We could not then keep one dog; we should have to keep three dogs at least. One would be the dog nutritive, the other the dog reproductive, a third dog locomotive.[92]

Regardless of their comic intent, these monstrous and outlandish analogies reveal ample anxiety. The author concludes that of the specimens exhibited in the Coral Gallery, he aligns his sympathy with the sponge, which being 'of two sexes, quaint as the fact may seem', therefore 'admits of a certain amount of tender sentiment', whereas jellyfish will 'never know exactly what they are, or be able to

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[89] British Museum, *Guide to the Coral Gallery*, 60-62.

[90] The essential morphology of siphonophores was still under debate at the time of the Challenger report: Haeckel writes of two opposing theories, the *'poly-organ'* and *'poly-person'*, the first and older of which saw the siphonophore as a 'Medusa-like animal' distinct only in its multiplication and differentiation of polymorphic organs, while the more recent theory sought to establish the siphonophore as a colony of individual animals. Ernst Haeckel, *Report on the scientific results of the voyage of H.M.S. Challenger during the years 1873-76 under the command of Captain George S. Nares and the late Captain Frank Tourle Thomson, Zoology: Report on the Siphonophorae*, vol. 28, 1.

[91] 'Our Coral Gallery'.

[92] 'Our Coral Gallery'.

recognise their own offspring, or prevent their own limbs going off by themselves'.[93]

Marine invertebrate anatomy was a source of fascination and apprehension. The extreme otherness of the creatures' anatomy presented difficulties for both scientific and popular understanding. Darwin's labelling of head, mouth, legs, anus and feet in barnacle anatomy resulted in both physiological limitations for zoology as well as imaginings of the grotesquely distorted human form.[94] Rebecca Stott argues that in mid-century, the marine invertebrate presaged the ape as a primal 'parent' organism, providing an absurd precedent to the disturbing ideas about race and degeneration that accompanied the later century's 'gorilla craze', marking what she calls 'a significant moment in the history of the popular reception of evolutionary theory, a transition from comic fantasy to tragic nightmare, from slime to fur'.[95] As demonstrated here, the extent to which this earlier evolutionary model stirred the popular imagination is borne out in cartoons and the popular press as in art and design.

Nevertheless, invertebrates' bewildering anatomical processes and their potential connections to modern humans continued to unsettle throughout the late century. Ernst Haeckel made these associations explicit with his biogenetic law – the theory that the individual organism's development recapitulates the evolutionary stages of the species, or that phylogeny repeats ontogeny.[96] By demonstrating embryonic likenesses, Haeckel controversially connected human development not only to dogs and apes, but also to the invertebrates so low on his evolutionary tree.[97] Perhaps in response to these unsettling connections, other scientific writers denigrated invertebrate anatomy. In their 1889 tome *The Evolution of Sex*, Patrick Geddes and J. Arthur Thomson designated hermaphroditism, common to flowers and 'lower animals', a 'reversion' and parthenogenesis – reproduction without fertilisation – 'degenerate'.[98] While asexual reproduction presented a source of fascination for evolutionary theory, it

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[93] 'Our Coral Gallery'. It is unclear here whether the author has mistaken sponges, which are hermaphroditic, as sexually dimorphic.
[94] Rebecca Stott, 'Darwin's Barnacles: Mid-Century Victorian Natural History and the Marine Grotesque', in Roger Lockhurst and Josephine McDonagh, eds, *Transactions and Encounters: Science and Culture in the Nineteenth Century* (Manchester: Manchester University Press, 2002), 159.
[95] Stott, 'Darwin's Barnacles', 151, 152.
[96] Haeckel, *Natural History of Creation*, 309-10.
[97] See Hopwood, 'Pictures of Evolution and Charges of Fraud', *passim*.
[98] Patrick Geddes and J. Arthur Thomson, *The Evolution of Sex* (London: Walter Scott, 1889), 65, 71, 169.

also marked a biological obsolescence, as it elided the highly defined divisions of labour deemed essential to sexual division into male and female roles.

Thus, marine invertebrate anatomy was interpreted according to Victorian social norms as well as human physiology. According to biologist and social philosopher Herbert Spencer's 'transcendental physiology', homogeneity marked those 'lowest forms of life' generated from the union of identical cells, while those formed by 'sperm-cell and germ-cell' were identified by 'greater heterogeneity', being the ultimate aim of the organism and species.[99] This law of difference applied to the organism's habitat as well as its mode of reproduction, so that in higher organisms one could identify greater differentiation in morphology from their surroundings. Spencer used the example of zoophytes, which exhibited a 'mode of growth not more determinate than plants':[100]

> One of those lowly gelatinous forms, so transparent and colourless as to be with difficulty distinguished from the water it floats in, is not more like its medium in chemical, mechanical, optical, thermal, and other properties, than it is like in the passivity with which it submits to all the actions brought to bear on it.[101]

He hypothesised that the more organised a species, the less it resembles its 'medium' and the more it counteracts it. Nevertheless, Spencer praised the same passivity of movement of animals such as jellyfish and siphonophores, largely caused by the movement of currents, as being responsible for a certain gracefulness resulting from minimal expenditure of force.[102] Expounding on the appeal of such creatures' weightless effortlessness, he writes that 'this notion of Grace has its subjective basis in Sympathy', explaining that when animals or inanimate objects appear at ease and unencumbered, 'we sympathize with the pleasant sensations they imply in those exhibiting them'.[103]

Spencer's sympathetic grace echoes the *Daily Telegraph* writer's sympathy for the hermaphroditic sponge as well as the more poetic musings on marine invertebrate life by Michelet, demonstrating once again how the animals' otherworldly aesthetics interfaced with evolutionary theories, if somewhat contradictorily. These conflicted notions are manifest in the Blaschka models, with their own fragmented glass anatomy which fails to uphold the classical

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[99] Herbert Spencer, 'Transcendental Physiology', in *Essays: Scientific, Political, and Speculative*, vol. 3 (London: Williams and Norgate, 1878), 373-74.
[100] Spencer, 'Transcendental Physiology', 381.
[101] Spencer, 'Transcendental Physiology', 385.
[102] Spencer, 'Gracefulness', in *Essays*, 313.
[103] Spencer, 'Gracefulness', 318.

solidity of an ideal unified subject, but nevertheless communicates the animals' compelling grace and beauty.

Radical Social Models

Regardless that theirs was seemingly irreconcilable with human biology, marine invertebrates were nevertheless anthropomorphised according to Victorian beliefs about class, gender and race. Spencer compared increased heterogeneity in higher organisms to that in more advanced human societies. The development from the 'drudgery' of all individuals performing the same tasks in 'barbarous tribes' to more differentiated language and social activities in modern Western society marked for Spencer '[t]he advance from the simple to the complex', and mirrored evolutionary development.[104] He compared 'bushmen' to protozoa, 'savages' with minimal government to polyps, slightly more developed 'primitive' societies to hydra and so on.[105] The passivity he depreciated as a trait of homogeneity in organisms, species and societies alike was both racialised and feminised.[106] Popularised versions of evolutionary theory placed white Western man at the apex of development. Haeckel's theory of recapitulation was eagerly adopted by biologists and anthropologists to account for the perceived arrested development of both 'primitives' and women, whose attractiveness – like certain marine invertebrates – was based in their simplicity.[107] According to feminist critiques, these groups functioned to buffer modern Western man from the beastly ancestors intimated by Darwin's disturbing theory.[108]

Alternatively, however, the animals taken up by the Blaschkas and their centrality to evolutionary theory may equally possess radical implications. Darwin proposed that a 'coral of life' presented a more accurate model of evolution than the popular tree model, as the dead bases of coral branches indicated invisible

[104] Spencer, 'Progress: Its Law and Cause', in *Essays*, 16-20.
[105] For a critique of such theories, see Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, MA: Harvard University Press, 1989), 155-80.
[106] Geddes and Thomson famously – and inaccurately – correlated male vigour and female passivity within organisms to the cellular level, imaging sperm as vigorous and motile and egg as passive and sessile. Geddes and Thomson, 35-40.
[107] Russett, 51, 11.
[108] Russett, 14.

'passages' (fig. 3.23).[109] Historian of art and science Julia Voss has demonstrated how in the years leading up to the publication of the *Origin of Species* in 1859, the development of evolutionary theories via diagrams by Martin Barry, Benjamin William Carpenter and Robert Chambers reveals an increasing emphasis on a streamlined, verticalised, progressive model.[110] In such hierarchical conceptions Voss writes: 'Organisms were striving toward a goal – it seemed as though, deep down, every fish, every reptile, and every bird wanted to be a mammal.'[111] This teleological trend can be seen as culminating in Haeckel's 'luxuriant oak' of 1874, which became the definitive evolutionary model for many years to come, and which clearly positions 'man' as evolutionary endpoint.[112] In contrast, Voss argues, Darwin's ideas about nature presented a departure in their lack of archetypal ideal, instead emphasising varied accident.[113] While this more chaotic version of evolution was recorded in Darwin's own diagrams, it gave way to an uncharacteristic symmetry, regularity and order in his published work due to the limitation of printing processes, as a result of which 'Darwin's visualized disorder was lost'.[114] Voss suggests that the unforeseeable hodgepodge of nature and its break from teleological conceptions is what makes Darwin's work unique. She proposes that the nineteenth-century criticism of his theory as 'higgledy-pigglety' (*sic*) should be reclaimed as positive descriptor, much like 'impressionist' and 'gothic' became accepted labels of their respective movements.[115]

This distinction from the evolutionary ideas both preceding and subsequent to Darwin begs a reconsideration of the social implications of his theory apart from its traditional feminist critique as a justification for sexual and racial power imbalances.[116] Elizabeth Grosz suggests that out of a re-reading of Darwinian theory, one that rejects social evolutionists' linear, teleological

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[109] Darwin, Notebook B, 20, 26, quoted in Julia Voss, *Darwin's Pictures: Views of Evolutionary Theory, 1837-1874*, trans. Lori Lantz (London: Yale University Press, 2010), 90.
[110] Voss, 93-99.
[111] Voss, 97-98.
[112] Voss, 122-23.
[113] Voss, 100-101.
[114] Voss, 118, 121.
[115] Voss, 124.
[116] See Evelleen Richards, 'Darwin and the Descent of Women', in David Oldroyd and Ian Langham, eds, *The Wider Domain of Evolutionary Thought*, vol. 2 (Dordrecht, NL: D. Reidel, 1983), 57-111; Rosemary Jann, 'Darwin and the Anthropologists: Sexual Selection and Its Discontents', *Victorian Studies* 37.2 (winter 1994), 287-306; Ruth Hubbard, 'Have Only Men Evolved?' in Hubbard, Mary Sue Henifen and Barbara Fried, eds, *Women Looking at Biology Looking at Women: A Collection of Feminist Critiques* (Boston: G.K. Hall, 1979), 7-36; Flavia Alaya, 'Victorian Science and the "Genius" of Woman', *Journal of the History of Ideas* 38 (1977), 261-80; and Helena Cronin, *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991).

interpretations in favour of Darwin's central premises of unpredictability, randomness and dynamism, a new understanding of subjectivity and sexual relations can emerge. Far from a static, homogenising theory, Grosz sees Darwin's work as expounding the dynamic forces of difference which propagate life on earth, thereby decentring the human and destabilising a hierarchical model, resulting in an understanding of 'life as no longer bound by and defined through a hierarchy in which man is the pinnacle of all living forms'.[117] She writes:

> He has developed an entirely new understanding of life based on the entwining of natural with sexual selection, enveloping the forces that make up the environment of a living being with the forces of attraction and appeal to create individuals and species that differ as much as possible in their forms and capacities; life as the ever more complex elaboration of difference.[118]

This difference, Grosz stresses, is not confined in Darwin to a binarised male/female model, but is intended to open up an infinite range of biological variations.[119] For example in the case of Darwin's barnacles, as feminist theorist and historian of science Elizabeth A. Wilson argues, '[T]hese females and hermaphrodites with many husbands are not simply the intermediary stages in the evolution of barnacle form; they are also evidence of the somatic diversity that nature produces.'[120] Correspondingly, Gillian Beer writes that although *Origin of Species* personified nature as feminine and emphasised male-female division, Darwin nevertheless placed the primordial ancestor outside of gender with the pronoun 'it'.[121] She claims that his emphasis on difference set his thought apart from that of his predecessors and contemporaries – for example Haeckel's Monism.[122] Grosz posits that Darwin's 'concept of life larger than itself, open to and directly by otherness, by forces and energies that imply newness and invention' makes his work worthy of feminist investigation.[123]

A vision of life's inventive and infinite range is captured in the Blaschka models, from the plant-like anemones to the colonial siphonophores with their thousands of wandering polyps, or 'limbs'. Rather than merely presenting an unfathomable or disturbing otherness to the gender dichotomy, the preoccupation

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[117] Grosz, *Becoming Undone*, 3.
[118] Grosz, *Becoming Undone*, 4.
[119] Grosz, *Becoming Undone*, 221 n. 10.
[120] Wilson, 284.
[121] Gillian Beer, 'Introduction', in Charles Darwin, *On the Origin of Species* (1859) (Oxford: Oxford University Press, 2009), xxiv.
[122] Beer, xvii.
[123] Grosz, *Time Travels*, 44.

with the creatures displayed in the Coral Gallery alternatively marks a concentrated interest in different sexual models. The paradoxical degradation and captivation with alternative sexualities resonates with Michel Foucault's hypothesis that so-called sexual repression throughout the Victorian era in truth marks a discursive explosion in the arena of sexuality, pointing towards possible alternative readings of the sexual implications such animals might have held in this period.[124] Even Geddes and Thomson praised 'all the beauty of the siphonophore colonies' for their highly developed division of labour, despite the fact that it evaded all-important sexual division.[125]

Coral itself – the branching colonies reproducing through both unisexual and hermaphroditic means – embodies an alternative social model. Like Voss, art historian Horst Bredekamp finds the anarchic nature of coral, with its fossilised branches and unanticipated regrowth, integral to the processual and changeable character of natural selection.[126] Bredekamp traces the traditional aesthetic and romantic iconology of coral within Darwin's theory, arguing that the naturalist harnessed coral's metaphors of creativity, democracy and the chaotic unconscious.[127] Thus, instead of disrupting romantic conceptions of nature and the sea – which reach their height in Michelet's treatise, written contemporaneously to *On the Origin of Species* – Bredekamp argues that Darwin drew on the legacy of *Naturphilosophie*.[128] This point aligns Darwin's principles with Haeckel's more than is normally conceded. Darwin's aesthetic response to such creatures is evident in his 1879 hypothesis that while the 'glass-like appearance' of jellyfish might protect them from predators' view and their 'beautiful or even gorgeous' colours possibly function to warn predators of their bad taste, they are equally likely of no evolutionary purpose – he compares their beauty to that of colourful autumn leaves, which fulfils no particular function for the trees.[129]

Such rereadings of invertebrate anatomy's significance for evolutionary theory resonate with the semi-chaotic display of 'wonders' in the Coral Gallery, and its displacement of the Shell Galleries' taxonomy. The implications overturn

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[124] Michel Foucault, *The History of Sexuality: Volume 1: An Introduction* (1978), trans. Robert Hurley (New York: Vintage, 1990), 17.
[125] Geddes and Thomson, 194.
[126] Horst Bredekamp, *Darwins Korallen: Frühe Evolutionsmodelle und die Tradition der Naturgeschichte* (Berlin: Wagenbach Verlag, 2005), 17-20. My thanks to Sandra Rehme for her help with translation from the original German.
[127] Bredekamp, 67-68.
[128] Bredekamp, 70.
[129] Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (1871) (London: Penguin, 2004), 302.

standard assumptions about Victorian morality's sexual norms and scientific orthodoxy. The contradictory reactions to the animals and to their countenance in the Blaschka models opens up different conceptions of sexuality and society. Writing on moral projections onto non-human social animals, Karen Barad theorises the queerness of the smallest and lowliest of creatures. Although human moralism usually assumes a nature/culture divide, taking morality as a uniquely human facility, it is constantly breeching this distinction, Barad writes.[130] Moralising reactions against queer interspecies imaginings invoked by evolutionary theory are evident in the casting the sponge as sympathetic, and other animals as degenerate.

Although Barad's focus is on amoebae and atoms, the hermaphroditic and colonial organisms featured in the Coral Gallery can be seen as historical predecessors of these queerly shape-shifting agents and their cultural resonance. Barad distinguishes her use of 'queer' from a mere synonym for 'odd' or 'strange', emphasising an active indeterminacy within space, time and usual conceptions of being.[131] She writes: '*Queer* is itself a lively mutating organism, a desiring radical openness, an edgy protean differentiating multiplicity, an agential dis/continuity, an enfolded reiteratively materializing promiscuously inventive spatiotemporality.'[132] Performativity – the active, material constitution of identity in contrast to social constructivist concepts of representation or mirroring – is integral to Barad's concept of queerness as it is to queer theory generally. However, she writes that its theorisation has largely been limited to the realms of discourse and the human at the expense of the material and the animal.[133] While Barad's example of atoms mobilises a twentieth-century phenomenal conception, the nineteenth-century grasp on corals, jellyfish and siphonophores within evolutionary and popular understanding offers an analogous struggle with queer critters. Such animals and their cultural invocations actively queer notions of

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[130] Barad offers the example of the contemporary conservative legal definition of homosexual 'crimes against nature' as, ironically, sexual acts of a 'bestial character' (for example in Idaho's statutes). She relates such queer interspecies imaginings to recent fears over amoebae which morph from single cells into blob-like social units, manifest in hysterical responses to viral epidemics including HIV/AIDS and echoed in 'virulent strains' of systemic racism – an early example being the Nazi analogy of antisemitism with delousing. Barad, 'Nature's Queer Performativity', *Kvinder, Køn og forskning/ Women, Gender and Research* 1-2 (2012), 28, 27, 30-31.

[131] Barad, 'Nature's Queer Performativity', 39.

[132] Barad, 'Nature's Queer Performativity', 29. Emphasis in original.

[133] For example in Judith Butler's classic account. See Barad, *Meeting the Universe Halfway*, 209, 192; and Butler, *Bodies That Matter: On the Discursive Limits of 'Sex'* (1993), new edn (London: Routledge, 2011), *passim*.

identity, not simply as anthropomorphic stand-ins but in their biological realities and their resistance to such mirroring.

Transparent Bodies?

Like the animals to which they correspond, as performative objects the Blaschka models are clearly more than 'reproductions' or even representations, conduits between the 'original' animal-object and its perception by the subject. The continued notion that the models are copies, subordinate to the originals, maintains gendered ramifications, as copying was relegated to women's work in the nineteenth century.[134] This marginalised status might explain why the Museum disregarded the models. In contrast, Gilles Deleuze and Félix Guattari propose the model as a process of mapping, rather than of tracing: the intermediate state of simulation a process that produces the real, or more-than-real.[135] Hence, regardless of their ostensible use as stand-ins, the Blaschka models can be seen as uniquely purposeful in the Natural History Museum's displays separately from the animals themselves. Donna Haraway writes: 'Boundaries are drawn by mapping practices; "objects" do not pre-exist as such.'[136] While models may be conceived as working within networks of humans and non-humans as in Bruno Latour's Actor-Network-Theory, following Haraway's lead Barad takes this idea a step further by refusing to take such agents as predetermined and discrete: her posthumanist performativity holds objects, whether human or non-human, organic or inorganic, as entangled, mutually generative agencies.[137] Barad's theory of agential realism takes matter to be productive rather than fixed, and therefore opposes representationalism, the independently determinate existence of words and things, as rooted in an almighty linguistic mirroring and the distrust of matter.[138] Like Deleuze and Guattari's insistence on modelling as productive of reality,

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[134] Hillel Schwartz, *The Culture of the Copy: Striking Likenesses, Unreasonable Facsimiles* (New York: Zone Books, 1996), 224-5. Schwartz writes that male is to female as original is to copy ever since the second account of Creation in Genesis 2.22.
[135] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (1980), trans. Brian Massumi (London: Continuum, 2004), 12; Deleuze and Guattari, *Anti-Oedipus: Capitalism and Schizophrenia* (1972), trans. Brian Massumi (London: Continuum, 2004), 87.
[136] Donna Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in *Simians, Cyborgs, and Women: The Reinvention of Nature* (London: Free Association, 1991), 201.
[137] See Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005), 10-11.
[138] Barad, *Meeting the Universe Halfway*, 195, 133.

performativity's basis in matter overthrows the subordinate position of the models.

Nevertheless, mapping, like copying, is still etymologically linked to the two-dimensional.[139] In order to appreciate the unique status of the Blaschka models, it is useful, somewhat ironically, to examine the glassmakers' working drawings. From Leopold's early awkward renderings of anemones to the later increasingly sophisticated siphonophore illustrations, these demonstrate the distinctness of the three-dimensional modelling process from two-dimensional rendering. Sketches of varying finish reveal a surprising lack of depth, while their composition (or lack thereof) reveals a wholly different conception of the relation of objects in space between the drawn form within the picture plane and the model on display on the museum shelf or elsewhere (fig. 3.24). As such, these drawings indicate the inimitable work achieved in the processes of both model making and glassmaking.

Of course the feature that most distinguishes the models from their referents – both animals and illustrations – is their materiality. Amorphous, brittle and transparent, glass harbours a host of enigmas and paradoxes of its own. In her book *Victorian Glassworlds*, Isobel Armstrong designates glass material of modernity, a defining medium to nineteenth-century experience: from the architecture and display cases of the Crystal Palace to the microscope lens, glass functioned as an omnipresent but invisible third member between the seer and the seen, not unlike the model.[140] Its amorphous quality not only connects it to water but also to aquatic animals, especially those lacking skeletons.[141] Glass's destabilising effects on perception are directly linked to the seemingly distorted bodies of marine invertebrates in microscopic vision. The microscope facilitated looking into and through the disturbing details of invertebrate anatomy, resulting in the trope of the 'transparency of primal life'.[142] This scopophilic penetration and dissection encapsulates the Haeckelian visualisation of sea creatures, for example, compared with Gosse's earlier discrete opaque realisations.

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[139] According to the OED, 'map' originates from the early sixteenth century, from medieval Latin *mappa mundi*, literally 'sheet of the world', from Latin *mappa* 'sheet, napkin'; 'copy' is from the Middle English (denoting a transcript or copy of a document), from medieval Latin for 'transcript' via Old French.
[140] Isobel Armstrong, *Victorian Glassworlds: Glass Culture and the Imagination, 1830-1880* (Oxford: Oxford University Press, 2008), 7.
[141] Lorraine Daston, 'The Glass Flowers', in Daston, ed., *Things That Talk*, 232.
[142] Armstrong, 327.

In their transparency the Blaschka models purported veracity, a sort of naked truth. Unlike jarred specimens which took on a rubbery opacity or other models in the Coral Gallery and throughout the museum made from wax, plaster and papier-mâché,[143] the glass marine invertebrates enabled the viewer to look into and through. In their unique ability to visualise the remote and taciturn creatures of the ocean's depths for unhindered display and observation, they presented a triumph of scientific visualisation related to modern imaging technologies, such as x-rays and microscopy, and the emergence of a new scientific and medical gaze upholding the 'ideal of transparency'.[144] Set within glass cabinets in the Coral Gallery, the glass models acquired a triple glaze, from vitrine to model to microscopic marine invertebrate anatomy. They enacted a mise-en-abyme of seeing and seeing through in their dialectic of spectacle and transparency.

However, the models were not entirely transparent, nor were they purely glass. Despite being technically meticulous and illusionistically convincing, the techniques the Blaschkas employed at their benches – glassblowing by mouth and by air tubes attached to foot-pumped treadles, fusing, gluing of small particles, hand painting – leave their imprint on the objects.[145] The use of other materials – copper wire to connect and reinforce delicate parts, glue or paint mixed with granules to convey thicker or textured skin, finely speckled pigment to achieve a jelly-like translucency and paper and even animal skin to simulate internal organs[146] – negates material purity. The semi-opaque models are mixed media objects with various obscuring, evocative textures. Compared with models in other media, the glass marine invertebrates appeared fragile in their fine parts, lacking the opaque coherence of other substances. At the same time, their fine individual parts echoed the fragmented bodies and corresponding alternative social and sexual models of the creatures that were alternately seen as repulsive and compelling.

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[143] Made by Václav Fric, among others. For more information on microscopic models at the Natural History Museum, see Miller, 'Micropalaeontological Models at the Natural History Museum, London', *The Geological Curator* 7.7 (2003), 263-74. Fric, who traded in rocks, fossils, preserved animals and plants as well as models made of wax, papier-mâché and glass, acted as the Blaschkas' dealer in Austria-Hungary. See Reiling, 'Glass Models of Soft Bodied Animals: The Relation Between Blaschka, Fric and the National Museum', *Journal of the National Museum, Natural History Series*, 171.1-4 (2002), 81-84.

[144] José Van Dijck, *The Transparent Body: A Cultural Analysis of Medical Imaging* (Seattle: University of Washington Press, 2005), 5.

[145] Rossi-Wilcox, Reiling and Bisaga, 175.

[146] Meechan and Reiling, 21-22.

One of the most impressive aspects of the Blaschkas' story is that the thousands of models they manufactured and distributed to major museums and private collections across the world were apparently produced by only two people.[147] While the models captured the admiration of eminent scientists and keepers of natural history departments, in the end they were the product of a family craft carried on by a father and son in their workshop. Both the material qualities of the models and the working processes behind them conjure associations that are incongruous with ideals of mechanical objectivity. Bubbles trapped in the cooling-off process, inevitable in handmade glass, betray the glassmaker's touch, while mouth-blown glass retains his breath.[148]

These types of inconsistencies comprise glass's paradoxical nature. According to Armstrong, in its combination of frozen liquid and 'petrified' breath, glass becomes an 'ethereal *substance*'.[149] As a 'substance invoking matter and spirit' and a membrane between subject and object, it corresponds to the dual purpose of models and their liminal position.[150] Ludmilla Jordanova observes 'an interchange between revelation and concealment, a theatricality in which models purport to reveal a reality without being the real thing themselves'.[151] Correspondingly, it is only through its interruption that the transparency of glass is revealed:

> Transparency is something that eliminates itself in the process of vision. It does away with obstruction by not declaring itself as a presence. But the paradox of this self-obliterating state is that we would not call it transparent but for the presence of physical matter, however invisible – its visible invisibility is what is important about transparency. It must be both medium and barrier.[152]

This self-obliteration corresponds to the paradox that the model's visual success results in its invisibility. Like the models, glass itself is chimeric, queer in its negation of the dualism between subject and object, seer and seen. Its veiled revelation recalls the generative film that envelops Michelet's sea creatures. While its visible transparency suggests water and its translucent inhabitants, its

[147] Sigwart, 'Crystal Creatures', 5.
[148] Armstrong, 226.
[149] Armstrong, 5. Emphasis in original.
[150] Armstrong, 5.
[151] Ludmilla Jordanova, 'Material Models as Visual Culture', in Soraya de Chadarevian and Nick Hopwood, eds, *Models: The Third Dimension of Science* (Stanford, CA: Stanford University Press), 449.
[152] Armstrong, 11.

paradoxical nature also connects to the elusive, hermaphroditic organisms of the sea.

Glass Eyes and Other Models of Vision

The transparency of the glass marine models relates to the Blaschkas' simultaneous production of glass eyes, another attempt at virtuosic mimesis with innate limitations (fig. 3.25). Some of these were for taxidermy; the zoology department at the Natural History Museum likely purchased eyes for its specimens from the glassmakers on several occasions.[153] However, the majority of the eyes, which they continued to manufacture throughout their marine modelling career due to their lucrative nature, were for human use.[154] In the nineteenth century, eyes were believed to be scientific instruments in and of themselves, and yet these visually convincing prostheses were useless for sight. Art historian Jonathan Crary has described a paradigmatic shift occurring in the early nineteenth century, in which the classical model of vision as a passive experience on behalf of the observer gave way to an understanding of vision as rooted in the body, with the subject as 'both the site and producer of sensation'.[155] However, accompanying the newfound understanding of sight as subjective was distrust of the body/subject's unreliability in comparison with the 'unprejudiced, unthinking, blind sight' of mechanical objectivity described by Daston and Galison.[156] One can consider how heightened microscopic vision, for example, destabilised the veracity of the eye; the microscope became a superior if monstrous prosthesis, a conduit between the intermediacy of vision and of evolution.

However, Donna Haraway writes that the modern technological 'eye' of the prosthetic device negates the possibility of passive vision: the visual prosthesis demonstrates how all sensation is mediated and thus presents the potential for an embodied feminist objectivity.[157] Karen Barad takes her cue from Haraway when she classifies such apparatuses as material-discursive phenomena working in

[153] Miller and Lowe, 'The Natural History Museum Blaschka Collections', 56.
[154] Meechan and Reiling, 16.
[155] Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1992), 75.
[156] Daston and Galison, 16.
[157] Haraway, 'Situated Knowledges', 190.

intra-action – including between humans and non-humans.[158] Barad cites the recent discovery concerning the brittlestar, a brainless and eyeless deep-sea invertebrate related to the starfish, sea urchin and sea cucumber, whose skeletal system also functions as a visual system. Thousands of calcite crystals coating the exterior of the brittlestar function as microlenses which collect and focus light directly onto nerve bundles, enabling the animal to navigate around obstacles and flee from predators.[159] While Barad compares the photosensitive capacities of the 'primitive' brittlestar with contemporary developments in human photo-engineering, she is primarily interested in how the creature's visualising system puts forth an alternative epistemological model to Western representationalism:

> [A]s long as representation is the name of the game, the notion of mediation – whether through the lens of consciousness, language, culture, technology, or labor – holds nature at bay, beyond our grasp, generating and regenerating the philosophical problem of the possibility of human knowledge out of this metaphysical quarantining of the object world.[160]

In comparison with this arm's-length understanding of reality, the brittlestar's visual system nullifies the mediated epistemology of representation as well as the geometrical optics of reflection: as Barad writes, 'Brittlestars don't *have* eyes; they *are* eyes.'[161] The animal's actions and perceptions, mutually inextricable, are materially enacted in the context of its environment; its body is never a passive receptor, but an active agent in its material reality; this reality, including its differentiation of self and other, is not fixed, but is constantly being enacted.[162]

Siphonophores have no eyes. Some jellyfish have ocelli, dark pits without corneas or lenses, which cannot form images but detect sunlight to let them know which way is up. On displays of taxidermised mammals in the museum, Haraway writes, 'The glass front of the diorama forbids the body's entry, but the gaze invites [the viewer's] visual penetration.'[163] Without a returning gaze, the Blaschka models are reified as objects, and subsequently so are the eyeless animals. On the other hand, the absence of eyes in the siphonophore, jellyfish and anemone models only seems to enhance their deceptive quality – without the dead gaze returned by glass eyes in taxidermy specimens, the feature that ultimately belies their illusion, the sea creatures' apparent life force is sustained.

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[158] Barad, *Meeting the Universe Halfway*, 203, 206.
[159] Barad, *Meeting the Universe Halfway*, 370.
[160] Barad, *Meeting the Universe Halfway*, 375.
[161] Barad, *Meeting the Universe Halfway*, 375.
[162] Barad, *Meeting the Universe Halfway*, 375-76.
[163] Haraway, 'Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936', *Social Text* 11 (winter 1984-85), 25.

While the viewer's gaze is not reflected, neither is it absorbed. Deleuze and Guattari see the face as the primary mechanism of signification: 'The face constructs the wall that the signifier needs in order to bounce off of.'[164] However, they write, the gaze is secondary to the 'black hole' of faciality; the gaze deflects while the face absorbs.[165] Like glass, facelessness circumvents the gaze, allowing the viewer to see through the simulation. Comparison with the Blaschka models of squid and octopi demonstrates this distinction: with eyes and arguably faces, these cephalopod models appear frozen, lifeless in spite of their uncanny approximation (figs 3.26, 3.27). Their simulation appears contained, whereas the model cnidarians – sea anemones, jellyfish and siphonophores – maintain an openness and suggestibility to signs of life. The visible absence of the face and eye at once distances and animates these models.

How we look at the Blaschka models can suggest an alternative mode of vision. The optical model of diffraction, according to Barad, offers an alternative, heterogeneous metaphor to reflection's fixation on original and copy.[166] In contrast to reflection's 'geometries of sameness', Barad argues that as both metaphor and physical phenomenon, diffraction embodies relational, entangled difference that makes it a useful tool for feminist analysis.[167] Defined as the passing of light, or other system of waves (whether water, sound or electromagnetic) through a slit, and the resulting bending and spreading out to create interference, diffraction occurs in ripple patterns in water, the wrapping of sound around objects and iridescence – as found in certain marine invertebrates and in the Blaschkas' glass models. In addition to an alternative epistemological metaphor to reflection – the mirroring upon which representationalism is based – I propose that diffraction equally presents an alternative physical-optical model to transparency, the ostensibly straightforward capacity to see through. Rather than offering a mirror of or window onto the world, its objects and creatures taken as separate and unchanging, the Blaschka models with their complex epistemological, visual and material relationships to the animals, diffract the gaze and understanding into an entangled and variable state.

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[164] Deleuze and Guattari, *A Thousand Plateaus*, 186.
[165] Deleuze and Guattari, *A Thousand Plateaus*, 190.
[166] Haraway, *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™* (1997), quoted in Barad, *Meeting the Universe Halfway*, 71.
[167] Barad, *Meeting the Universe Halfway*, 72.

Furthermore, for all their insistent visuality, trapped behind glass with their 'hold-your-breath fragility', the models persist to evoke senses other than sight.[168] Literary scholar Kate Flint claims that the interest in Victorian visuality lies in the 'slipperiness of the borderline between the visible and the invisible, and the questions it throws up about subjectivity, perception and point of view', thus providing a parallel with diffraction.[169] Even in isolation in the vitrine, as 'semiophores', to use Krzysztof Pomian's term, intermediaries between the visible and invisible, the models evoke the animals' evolutionary origins, their functions and their meaning, simultaneously didactic and fantastic.[170] They suggest a variety of potential sensual interactions, both pleasant and grotesque, including the sensory experience of the animals themselves. With no brains, blood, hearts or central nervous systems and often only one digestive cavity which functions as both mouth and anus, jellyfish's undifferentiated anatomy takes on a synaesthetic significance.[171] Siphonophores' allocation of digestive and waste functions to their various constituent specialised medusoids and polyps seems even more alien. Glass tentacles suggest the notorious, even deadly sting of certain creatures, such as the Portuguese man-of-war, whose tentacles are known to reach lengths of over fifty feet.[172] Awareness of this slimy, amorphous creature's sting marks yet another contrast with the physicality of the glass model. As extra-visual objects the models bring the treacherous yet wonderful aspects of the creatures to the attention of the other senses. These associations confuse expectations of late nineteenth-century evolutionary biology and its imaging, such as in Haeckel's organic crystallisations and the Blaschkas' gelatinous vitrifications.

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[168] Daston, 'Glass Flowers', 253. As well as their previous unpopularity, the Blaschka models' fragility is one reason they have rarely been exhibited, particularly due to the threat of damage during transportation.
[169] Kate Flint, *The Victorians and the Visual Imagination* (Cambridge: Cambridge University Press, 2000), 2.
[170] Krzysztof Pomian, *Collectors and Curiosities: Paris and Venice, 1500-1800*, trans. Elizabeth Wiles-Portier (Cambridge: Polity Press, 1990), 4, 25.
[171] Robert Michael Brain, 'Protoplasmania: Huxley, Haeckel, and the Vibratory Organism in Late Nineteenth-Century Science and Art', in Larson and Brauer, 108.
[172] A footnote to the Coral Gallery guide mentions that certain Polynesian natives fear the animal more than they do sharks. British Museum, *Guide to the Coral Gallery*, 63 n. 1.

Jewels of the Sea

Historians of science Soraya de Chadarevian and Nick Hopwood write that in the nineteenth century, 'models were a key medium of traffic between the sciences and the wider culture'.[173] Here I have considered the interchanges, or intra-actions, to use Barad's term, between the Blaschka models and museology, popular natural history, evolutionary theory, print culture and scientific imaging. However, the display of these ornate, dazzling objects, set in rows along glass shelves, some against black velvet to set off their jewel-like colours, conjures yet another technology of nineteenth-century vision: that of the department store. Displays in the Coral Gallery echoed those of jewellery and ornaments in nearby shop windows, which simultaneously served visual access and physical restraint to potential shoppers much like the vitrines of the Museum (figs 3.28, 3.29). The museum and the department store emerged at the same time in London; both profoundly influenced by the architecture and exhibition design of the Crystal Palace, they share parallel and interconnected histories. As London's West End became the centre for female shoppers, exhibitions in nearby museums – including the South Kensington Museum and the Natural History Museum – forged associations, in both their accessibility and displays.[174] While the connection between saleable items and the wealth of ornaments and jewellery on display at the South Kensington Museum would have been more obvious, it too held animal products in its departments, including ornamental objects and jewellery made of shells, pearls and coral, but also unworked specimens, sponges and corals, some preserved as wet preparations.[175] Housing the nascent Royal College of Science in its Henry Cole Wing, it even included Blaschka models in its collections.[176]

The continuum between decorative and natural objects on display and for sale is not so surprising at a time when natural history trends formed part of a new bourgeois consumer culture. Art historian Barbara Stafford writes, 'Browsing

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[173] De Chadarevian and Hopwood, 6.
[174] Erika Rappaport, *Shopping for Pleasure: Women in the Making of London's West End* (Princeton, NJ: Princeton University Press, 2000), 4.
[175] Peter Lund Simmonds, *The Commercial Products of the Animal Kingdom Employed in the Arts and Manufactures Shown in the Collection of the Bethnal Green Branch of the South Kensington Museum* (London: Eyre and Spottiswoode, 1880), 88-92. Also see Anthony Burton, *Vision and Accident: The Story of the Victoria and Albert Museum* (London: V&A, 1999), 45, 50-52.
[176] Miller and Lowe, 'The Natural History Museum Blaschka Collections', 51. The South Kensington Museum placed orders for full sets of Blaschka models in 1876 and 1888.

nature for possible possessions was akin to shopping. Infinity could be made manageable in consumable chunks'.[177] Clearly, the distinction between the 'natural' objects in the new Natural History Museum and the human artefacts left behind in Bloomsbury was not nearly as 'convenient and rational' as stated by the official literature.[178] The *General Guide* claimed, 'Special interest attaches itself to the case showing the different kinds of Sponges used in commerce.'[179] Meanwhile, in the Coral and Shell and Starfish Galleries the Natural History Museum too held pearl jewellery, as well as cameos, flowers, bracelets and brooches manufactured from shells and coral.[180]

Unlike jewellery and ornaments made from animal materials, the Blaschka models were animals made with jeweller's materials and techniques. The family trade that harked back to fifteenth-century Bohemia involved production of fine glass jewellery and ornaments, for which the Blaschkas also employed metal and semi-precious stones.[181] In his youth, Leopold had worked as a goldsmith and gem cutter for several years before returning to the family business of glass and metal.[182] Sketches in a Blaschka notebook of women's rings, earrings, necklaces, pendants and brooches, some based in natural forms, share similar qualities with drawings for the marine models (figs 3.30, 3.31): these drawings of glass baubles and droplets appear to determine relations of clusters and fragments that bear a clear lineage with models such as the *Physophora hydrostatica*.

While the models maintained the visual associations, and in the Natural History Museum, the display strategy of fetishised commerce, they also harbour connections to craft traditions. Bohemian glassmaking was commonly denounced in nineteenth-century Britain for being too colourful, misshapen and chaotic.[183] Nevertheless, it was widely imitated and ubiquitous in the Great Exhibition, and continued to hold a foremost position in Europe and internationally throughout the later century.[184] The lavish colours, voluminous forms and excessive detail of the Blaschka models reverberate with the tradition's appealing but embarrassing sense of flamboyance. In a different vein, Victorian Britain saw a thriving tradition of

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[177] Barbara Stafford, *Artful Science: Enlightenment Entertainment and the Eclipse of Visual Education* (Boston: MIT Press, 1994), 218.
[178] Flower, *General Guide* (1886), 14.
[179] Flower with Lankester, 44.
[180] Günther, *Guide to the Shell and Starfish Galleries*, 6.
[181] Swinney, 43. The family also apparently had links to Venice. Chris Meechan, 'A Glass Menagerie: The Work of Leopold and Rudolph [sic] Blaschka', *Glass Cone* 39 (spring 1995), 4.
[182] Meechan, 4.
[183] Armstrong, 232-34.
[184] Olga Drahotová et al, *Bohemian Glass* (Prague: Museum of Decorative Arts, 1992), 10.

feminine handicrafts, which included practices such as imitation wax coral – but by late century these were viewed as a 'reactionary pursuit' representing a receding set of values.[185] In addition to the increasing drive for museums to separate nature from culture, distaste for these types of crafts and their unstable position between natural material and artefact might help to explain the relocation of the South Kensington Museum's animal collections from Albertopolis to the Bethnal Green Museum in 1872.[186] Whether linked to post-Great Exhibition commodity culture or the earlier 'thing culture' of domestic and folk craft,[187] the Blaschka models held clear associations with objects that fell outside the realm of scientific imaging and its ideals of detached objectivity and the division from art.

Despite the Blaschkas' attempts to locate their production in the context of scientific objectivity, as set apart from the decorative and the domestic, these associations have remained dominant. Daston argues that the nature of the Blaschka models' beauty – which is fundamentally linked to their associations with jewellery, ornament and commodity – has rendered them suspect ever since the time they were produced: 'showy appearances versus hidden mechanisms, a distinction with affinities too close for comfort to that between vulgarity and refinement, or between phenomena and noumena'.[188] It is worth noting that the Blaschkas' later models of enlargements of invertebrate anatomy – those dealing with 'hidden mechanisms' and inner processes, including developmental stages – have been deemed the most scientifically useful.[189] However, although this development may have represented a deliberate shift from the conspicuous prettiness of the early models – the colourful sea anemones in situ on rocks and subsequent ethereal jellies and siphonophores – the glassmakers largely reverted to their trademark dazzling illusionism when they went on to produce Harvard's glass flowers.

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[185] Talia Schaffer, *Novel Craft: Victorian Domestic Handicraft and Nineteenth-Century Fiction* (New York: Oxford University Press, 2011), 3, 7.
[186] Charlotte Gere and Judy Rudoe, *Jewellery in the Age of Queen Victoria* (London: British Museum, 2010), 226.
[187] Schaffer, 14.
[188] Daston, 'The Glass Flowers', 251.
[189] Dyer, 36.

Conclusion

Much as a re-examination of Darwinian theory may urge a radical rethink of sexual identity, associations with feminised material culture suggests a breakdown of gender expectations. Caroline Arscott suggests that the challenge to manliness presented by ornamentation, as traditionally coded feminine, combined with the ideal of androgyny in late nineteenth-century decorative art might allow such work to be considered in terms other than phallic investment. Specifically considering the 'composite beings' of William Morris's designs, she draws on Jacques Derrida's concept of invagination to propose a reading that is 'sexual otherwise: beyond the division feminine/masculine, beyond bisexuality as well'.[190]

As 'chimeras', the Blaschka models resonate with this concept of genre- and gender-bending. It is their unabashed aestheticism as manifest in their idiosyncratic jewel-like manufacture, combined with the profound strangeness of the glassmakers' chosen subjects – hermaphroditic and colonial sea creatures – that render these unique objects queer. As amorphous glass objects linked inextricably to both developing modes of scientific visualisation and popular material and consumer culture, the Blaschka models mimic the unfixed morphology of the creatures on which they are based. In this singular combination, they evaded Victorian gender values and continue to challenge assumptions of the period. Their diffractive, or siphonophoric resonances extend beyond marine invertebrate anatomy and its wild fancies to multi-purpose glassmaking that could be equally at home in 'elegant living rooms' as in the vitrines of the Natural History Museum.

[190] Caroline Arscott, *William Morris and Edward Burne-Jones: Interlacings* (New Haven: Yale University Press, 2008), 12-13; Jacques Derrida, 'Interview: Choreographies: Jacques Derrida and Christie V. McDonald', *Diacritics* 12.2 (summer 1982), 76, quoted in Arscott, 229 n. 50.

CHAPTER FOUR

Feathered Jewels: Gould's Hummingbirds in the Ornithology Galleries

Following John Gould's death in February 1881, the British Museum purchased the famous ornithologist's renowned collection of hummingbirds. Encompassing approximately 300 species and several thousand individual specimens, both mounted and skins, the collection represented not only an important endowment for the Museum's natural history collections, but also a major feat for nineteenth-century natural history itself.[1] The most compelling aspect of the collection was sixty-two glass-sided cases full of brightly coloured hummingbirds carefully arranged amid foliage (fig. 4.1, 4.2).[2] This impressive set of displays had a long history in London: originally exhibited in 1851 as part of the Great Exhibition, they had subsequently been relocated to Gould's own drawing rooms, first on Broad Street in Soho then on Charlotte Street in Bloomsbury, before being displayed in the nearby British Museum in April 1881, and, eventually, moved to the new Natural History Museum in South Kensington in January 1884.[3]

In each incarnation, the hummingbird cases created a spectacle. Their wooden frames were entirely gilded, their golden sheen complementing the metallic effects of the birds' plumes.[4] Designed to be viewed in the round, instead of offering a fixed perspective onto the birds, the polygonal vitrines offered multiple tableaus of different species in various arrangements set amid artificial

[1] According to the Natural History Museum's guide, there were about 300 species and 2,000 mounted specimens in Gould's display for the Great Exhibition. Richard Bowdler Sharpe with Albert Günther, *A Guide to the Gould Collection of Humming-Birds in the British Museum* (London: British Museum (Natural History), 1881), 1. In 1861 Gould claimed that he held about 400 species in his collection. Gould, *An Introduction to the Trochilidae, or Family of Humming-Birds* (London: Taylor and Francis, 1861), 'Notice'. Isabella Tree writes that at the time of his death, Gould had amassed 1,500 mounted specimens and 3,800 unmounted. Tree, *The Bird Man: The Extraordinary Story of John Gould* (1991), 2nd edn (London: Ebury, 2003), 210.

[2] These are listed in Bowdler Sharpe, *Guide to the Gould Collection*.

[3] Of the original cases, only eight remain relatively intact, and are divided between the libraries of the South Kensington and Tring locations of the Natural History Museum.

[4] The gilded frames were eventually painted black and scientific labels identifying the names of species were added to the cases. Judging by photographs taken of the cases, gold and without labels in 1902 and black (though already chipped) and with labels c. 1909, these changes appear to have been implemented by the NHM in between these years. The example here has been restored to black with gold corner flourishes.

plants and flowers. The 'revolving' cases were positioned in the middle of the floor so that visitors could experience them from all angles.[5]

Hummingbirds, which formed a relatively unknown subject within Western natural history prior to the nineteenth century, had become a prominent subject of scientific study and popular interest, not least owing to Gould's well-promoted taxidermy displays and lavish illustrations and detailed descriptions in *A Monograph of the Trochilidae, or Family of Humming-Birds*, published from 1849-61.[6] Interest in the minuscule creatures formed part of a larger fascination with birds in the second half of the century that encompassed popular natural history, evolutionary theory, art and fashion.[7] This was evidenced by the popularity of the Bird Galleries, both in the Bloomsbury and South Kensington locations of the British Museum's natural history collections. One reviewer wrote that the British Birds displays 'delighted all lovers of nature when first inaugurated – by a household of coots – in the British Museum at Bloomsbury'; another claimed that in South Kensington, birds' nests were more appealing than nuggets of gold in the Mineral Gallery.[8]

The hummingbirds and their displays, however, stood out against the other bird specimens exhibited in the galleries. Forming a classification of their own, and exclusively found in the Americas, the Trochilidae were distinct from other bird families, and exotic to more domestic varieties. The display strategies in Gould's cases demonstrated this difference from the Museum's collection of native British birds, which were presented in naturalistic 'diorama' type family groupings.[9] Frequently compared to gems, hummingbirds were regularly displayed to show off their vibrant, jewel-like colours. The dress of many female visitors to the Museum would have reflected this allure: parts of, or entire stuffed hummingbirds on hats, dresses and, inevitably, jewellery formed a popular

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[5] Roslyn Russell, *The Business of Nature: John Gould and Australia* (Canberra: National Library of Australia, 2011), 62; and Tree, 175.
[6] In 1758, when Linnaeus's 10th edition of *Systema Naturae* was published, only eighteen species were known. Tree, 158.
[7] For a comprehensive listing of popular ornithology publications in the nineteenth century, see Jonathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006), 92-93.
[8] 'Birds in Their Homes', *Daily Telegraph* (29 Jan. 1884), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives; 'Natural History Museum', *Daily Chronicle* (28 Dec. 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[9] The term diorama only came to apply to such displays around the mid-twentieth century; they were more commonly referred to as 'habitat groups' from the late nineteenth to early twentieth centuries. Karen Wonders, *Habitat Dioramas: Illusions of Wilderness in Museums of Natural History* (Uppsala: Almqvist and Wiksell, 1993), 16-22. The contemporary Natural History Museum literature consistently uses the term 'bird groups'.

fashion by the 1880s (fig. 4.3). And yet, while women appropriated the birds' captivating plumage, it was the decoration of *male* hummingbirds that provoked evolutionary debates. Not unlike the peacock, whose feathers ironically came to symbolise the effeminacy of the Aesthetic Movement, hummingbirds suffered a transgender problem.[10] This formed the backdrop against which Gould's obsessive collection was developed and eventually situated within the Natural History Museum.

Even a London Sparrow

The addition of Gould's hummingbirds contributed to what was already by far the most popular aspect of the British Museum's natural history collections: in the Bird Galleries, according to one newspaper, 'even a London sparrow would attract attention'.[11] The Museum's collection of domestic birds was equally popular to the new hummingbird displays: 'All day long the corridor is filled with admiring visitors, and, indeed, the vocabulary of admiration is never exhausted. "Wonderful!" "Marvellous!" "Exquisite!" are the exclamations on every side.'[12] However, the Nesting Series of British Birds, or 'bird groups', were exhibited in an entirely different manner from the pretty compositions and heterogeneous species of the hummingbird cases.[13] Individual species were mounted as family units in their own cases with settings that mimicked their natural habitats (fig. 4.4-4.6).[14] Work on these displays began under keeper of zoology Albert Günther in 1875.[15] However, it was Günther's assistant Richard Bowdler Sharpe, an evolutionist who lectured on fossil remains and the dinosaur ancestry of birds, who was responsible for the bird groups and described as 'virtually the curator of

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[10] Jane Munro, 'More Like a Work of Art', in Diana Donald and Munro, eds, *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (New Haven: Yale University Press, 2009), 266.
[11] *The Saturday Review* (23 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[12] 'Birds in Their Homes'.
[13] W.R. Ogilvie-Grant, *Guide to the Gallery of Birds in the Department of Zoology of the British Museum (Natural History), Part II. Nesting Series of British Birds* (London: British Museum (Natural History), 1905).
[14] The blackbird and the storm petrel cases are the only two of the original series of 150 to have survived World War II bomb damage. 'Shaking Some Tail Feathers: New Bird Displays', *Evolve*, Natural History Museum Magazine, 23 (spring 2015), 18-19. All of the original series is described, with some cases illustrated, in Ogilvie-Grant.
[15] William T. Stearn, *The Natural History Museum at South Kensington: A History of the British Museum (Natural History) 1753-1980* (London: Heinemann, 1981), 55.

the bird department'.[16] Habitat groups, with their implied narratives of adaptation to environment, are normally associated with evolutionism.[17] The birds, mostly presented by Lord Walsingham, were mounted by German-born Camden Town-based taxidermist G. Pickhardt, who was celebrated for his techniques for suspending specimens as if in flight and whom Bowdler Sharpe hailed as 'without a rival as a bird-stuffer'.[18]

The bird groups were seen as introducing a novel sense of realism to taxidermy. Bowdler Sharpe described the careful realism endeavoured in the exhibition of nesting British birds:

> [I]n each case the scene is as nearly a reproduction of the actual facts as could be attained. The birds that actually built the nest and laid the eggs are there, and the bush or tree, their herbage and the flowers are also reproduced, as they were on the day when the nest was taken, the counterfeit leaves and flowers can scarcely be distinguished from the actual living plants. Dr Günther determined from the first to reproduce nothing but the actual facts, so as to give, as far as possible, a true life picture of the birds as they were in life.[19]

Newspapers equally extolled the naturalistic results:

> Sound and motion are impossible under the circumstances, but short of this, the representations are truly marvellous. The purpose of the authorities of the Museum is to convey information in natural history by means of the highest kind of object lessons.[20]

Writers conflated the scenes in the cases with their sources in nature, explaining how actual trees and bushes from the sites of nests were used in the displays.[21] One claimed, 'They are ore straight from the mine, not coins from the mint. … For these cases are not made up "to look pretty," or as "pictures", but they are as nearly as possible the actual thing itself.'[22]

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[16] 'The Ancestry of Birds', *Daily Chronicle* (19 May 1893); 'With the Birds', *Daily News* (30 May 1887). Both in Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[17] However, it should be noted that work began on the British bird groups under Richard Owen's directorship, despite his staunch anti-Darwinian views and contrary to Karen Wonders assertion that the Museum only began to adopt the diorama once W.H. Flower became director in 1884. Wonders, 101.
[18] 'Saturday Afternoons VIII: At the Natural History Museum, Cromwell-Road', *Pall Mall Gazette* (22 Feb. 1890), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives; Bowdler Sharpe, 'Ornithology at South Kensington', *The English Illustrated Magazine* 51 (Dec. 1887), 169.
[19] Bowdler Sharpe, 'Birds', in Albert Günther, *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 2: *Separate Historical Accounts of the Several Collections Included in the Department of Zoology* (London: British Museum (Natural History), 1906), 89.
[20] 'With the Birds'.
[21] 'The National Collections of Natural History', *The Times* (18 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[22] 'Birds in Their Homes'.

The belief in the bird groups as providing a window onto nature led to the recommendation of their 'object lessons' as an antidote for the 'pale-faced men and women' of densely populated areas of London without access to the countryside.[23] Günther explained: 'The object of this mode of exhibition was to give to the host of visitors who have hardly any opportunity of seeing or watching the wild birds of their own country a glimpse into their domestic arrangements.'[24] Philosopher Donna Haraway has written on the taxidermy diorama's 'spiritual vision' – in spite of purported evolutionary narratives – as a curative for 'Decadence – the threat of the city, civilization, machine'.[25] According to Haraway, the mounted specimen, 'frozen in a moment of supreme life', transcends any 'merely living organism': 'The gaze holds, and the wary animal heals those who will look.'[26] In the perceived naturalism of the bird group taxidermy and settings, mimesis was united with the real, or the 'actual thing itself', to achieve a unique hybrid between art and nature.

The bird groups were directly influenced by Edward Thomas Booth, whose prolific collection of British birds was kept in his museum in Brighton, founded in 1874.[27] Arranged in elaborate settings of rock and foliage with realistic painted backdrops, Booth's bird groups in their rectangular glass cases, stacked on top of one another in a grid, created a series of naturalistic tableaus and set a standard for bird taxidermy (fig. 4.7). In an address at the public opening of the Booth Museum in 1890, director of the Natural History Museum William Henry Flower praised the innovative realism of its displays: 'Here we have not only birds, but the home in which the birds dwelt, most carefully and accurately reproduced, and on such a scale and in such a manner as has never been done anywhere before.'[28] Similarly, Bowdler Sharpe hailed the Booth Museum as 'not surpassed in interest by any natural history exhibition in the whole world', and a harbinger of 'the museum of the future'.[29]

Although arranged in freestanding cases and lacking the painted backdrops of Booth's displays, the Natural History Museum's bird groups achieved a

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[23] 'With the Birds'.
[24] Günther, *History of the Collections*, vol. 2, appendix, 30.
[25] Donna Haraway, 'Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936', *Social Text* 11 (winter 1984-85), 25, 21.
[26] Haraway, 25.
[27] Bowdler Sharpe, 'Ornithology at South Kensington', 171.
[28] William Henry Flower, 'Address at the Opening of the Booth Museum at Brighton' (1890), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 71.
[29] Bowdler Sharpe, 'Ornithology at South Kensington', 171.

comparable level of naturalism which contrasted against other, earlier bird taxidermy still on display. One newspaper described the cases, and their distinction from more traditional bird displays:

> Under the new system, it is not enough to show the bird itself. To make the story complete we must associate him with his mate; supply the nest with eggs and brood; and place him in his natural haunts. It used to be thought sufficient to fill out the bird's skin, stick him on a pedestal, generally in an unnatural position, and enclose him, hard and ungraceful, in a glass case. By the modern plan it is sought to explain the leading characteristics of a species by the attitudes of its dead representatives.[30]

In the *General Guide*, Flower concurred: 'Far more care has also been taken in preserving the natural form and characteristic attitude of the birds than was formerly the case in Museums, as a large number of the old specimens in the wall-cases unhappily testify.'[31] Taxidermy specialist Pat Morris writes that the chief aim of earlier bird taxidermy was the preservation of specimens for primarily scientific observation.[32] In scientific collections, mounted birds were usually displayed discretely, in taxonomic sequence, rather than in simulated habitats. From the mid-nineteenth century, as museums strived to capture public audiences, and methods of preservation achieved new levels of sophistication, more evocative displays dramatising the lives of birds were matched by more elaborate techniques to capture the 'spirit' of the animal.[33]

The British Museum in Bloomsbury's original bird displays followed a more or less traditional taxonomic model, with specimens lined up in wall cases according to class and family, sometimes in pairs to highlight differences between the sexes, and combined with didactic physiological information (fig. 4.8). When the bird collections were moved to South Kensington in early 1884, displays such as these, with little hint of the animals' original context in the wild, save for the stumps and branches upon which they were routinely perched for stability, comprised the main Bird Gallery that stretched across the whole front western wing of the ground floor. Bowdler Sharpe lamented that 'the constrained attitudes of many of the specimens exhibited at Kensington form part of a legacy from the

[30] 'With the Birds'.
[31] Flower, *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1886), 30.
[32] P.A. Morris, *A History of Taxidermy: Art, Science and Bad Taste* (London: MPM, 2010), 53. For a history of bird taxidermy, see Morris, 35-60; and Paul Lawrence Farber, 'The Development of Taxidermy and the History of Ornithology', *Isis* 68.4 (1977), 550-66.
[33] Morris, 53.

parent institution'.[34] Nevertheless, along with the British birds installed along the first floor's large west corridor and Gould's hummingbirds mirroring them along the east corridor (figs 4.9, 4.10), this vast gallery ensured that birds in their varying modes of display maintained a high profile in the new Natural History Museum.

The Art of Taxidermy

Ironically, as museums became more popularised, taxidermy displays became more scientifically accurate. The 'rigid travesties' of earlier taxidermy, or as Bowdler Sharpe termed them, 'specimens belonging to the bad old times',[35] were deemed no longer adequate in the face of the 'new system'. However, to assume a straightforward narrative of progress undermines the integral position aesthetics held in methods of preservation. Historian of art and science Karen Wonders suggests that taxidermy's origins lie in the aesthetic intention to preserve the beauty of animals.[36] She writes that due to birds' beauty and rarity forming primary qualities of interest for eighteenth-century naturalists, bird taxidermy was 'motivated by aesthetic considerations rather than scientific ones'.[37] In the final decades of the nineteenth century, Flower, as a staunch evolutionist, defended taxidermy as comparable to painting or sculpture and waxed passionately on the 'subject of bird-stuffing' in relation to Booth's 'admirable specimens in the art of taxidermy'.[38] The Great Exhibition, which featured a noteworthy amount of preserved animals, including Gould's hummingbirds, had contributed importantly to the development of taxidermy and its recognition.[39] As Morris writes, 'Taxidermy was no longer just a tool for the advancement of science, but a source of pleasure and interest.'[40]

Despite the cases' seemingly uncanny simulations of nature, and their didactic and enlightening purposes, they were equally viewed as works of art that

[34] Bowdler Sharpe, 'Ornithology at South Kensington', 169.
[35] Morris, 56; Bowdler Sharpe, 'Ornithology at South Kensington', 170.
[36] Wonders, 23.
[37] Wonders, 25. Wonders refers to founder of the British Museum Hans Sloane's collection as an example.
[38] Flower, 'Museum Organisation': Presidential Address to the British Association for the Advancement of Science, Newcastle-on-Tyne (11 Sept. 1889), 18; Flower, 'Address at the Opening of the Booth Museum', 72.
[39] Morris, 54.
[40] Morris, 54.

trumped nature with their picturesque renderings and multitude of information.[41] They indulged viewers in a poetic and sentimental perspective onto bird life. One commentator conveyed a rosy picture of birds' family life as captured in the nesting cases:

> There the birds are – daisies, buttercups, and all – just as they had lived, as they worked, so busily and yet so cautiously, at their nests, as they watched over their little darlings and fed them, as they sate waiting for the passing insects or searched for them among the crevices of the bank or under the wrinkled leaves; as they sang and lamented, as they loved and quarrelled, as they lived and died. Each case is an epitome of the life of a family; a lyric poem straight from 'the great song-smith' Nature.[42]

Paradoxically idealised and mimetic, the bird groups appeared to seamlessly conflate art and science, thus imbuing virtue with veracity. As such their praise echoed that for Pre-Raphaelite painting, initially espoused by John Ruskin and later embraced by the public, as conveying moral truths through closely studied naturalistic detail.[43] However, the British bird displays relied on taxidermy's uniquely self-erasing art, paradoxically increasingly invisible the more skilful it is, to create convincing narratives of nature. Cultural historian Didier Maleuvre writes that 'the taxidermized animal is an image whose perfection lies in the successful concealment of human activity'.[44]

And yet this veiled artistry clearly fostered a highly anthropomorphised vision of bird life in the tableaus, or 'poems':

> From case to case the visitor passes from one lovely vignette to another, from poem to poem. He is admitted at every step the sweet secrets of wild bird-life – sees the parents with their nests, eggs, and fledgelings exactly as the butterflies fluttering above the flowers see them; exactly as the blue-bells nodding round the happy little household knows them. It is a rare privilege to have these glimpses into the pretty home-life of the birds always permitted.[45]

This voyeuristic perspective onto bird life enabled by the naturalistic constructions revealed a strong emphasis on sexuality and reproduction. The nesting series' theme ensured that British birds were shown, with little variation, in male-female pairs with nests, eggs and young. As well as attracting the admiration of visitors to the Bird Gallery, these 'masterpieces of scientific art'

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[41] 'British Birds at Cromwell Road', *Morning Post* (26 May 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[42] 'Birds in Their Homes'.
[43] See, for example, John Ruskin, *Pre-Raphaelitism* (New York: Wiley, 1851).
[44] Didier Maleuvre, *Museum Memories: History, Technology, Art* (Palo Alto: Stanford University Press, 1999), 214. Also see Wonders, 24; Haraway, 34; and Petra Lange-Berndt, *Animal Art: Präparierte Tiere in der Kunst, 1850 – 2000* (Munich: Silke Schreiber, 2009), 26.
[45] 'Birds in Their Homes'.

demonstrated key points of interest for evolutionary theory: mate selection and propagation of the species.[46] Scientific assessments of the merit of the bird groups, however, were divided, possibly on account of the popular nature of the displays and their anthropomorphic and selective content.[47] In case after case of the British birds, a standard narrative is repeated, one in which the female adult attends closely to her nest, and the male overlooks the scene at a slight distance. Sometimes, the female presents food to her young, as with the mother *Peregrine Falcon*, whose claws clutch a dead swallow to her chicks' delight, while the male of the species is frequently shown spreading his wings, as in the male peregrine and the *Black-Throated Diver*, or simply poses majestically, as with the *Common Heron* (figs 4.11-4.13). In most of these cases, as in the *Common Gull*, the male is positioned at a higher vantage point in the 'picture plane', as if overlooking his domain, while the female looks toward her young or her mate (fig. 4.14). Meanwhile the male's gaze is outwards – it draws the viewer in to the cosy scene, offering healing with its curative natural content, and instilling the family lessons of the artful constructions.

While the cases illustrate some aspects of sexual selection in evolution, specifically the role of secondary sexual characteristics in attracting a mate – for example, male plumage – it is difficult not to read a narrative of Victorian domesticity into these displays of British birds. In addition to exposing the London public to 'nature', and teaching evolutionary processes, it was surely these family values being communicated that deemed the exhibition so appropriate for the visitors (especially female) that crowded the gallery.[48] The 'nesting' cases show little variation from this vision of the monogamous couple and the nuclear family; other aspects of sexual selection, such as male-male competition, female selection and polygamy are notably absent from the displays. As literary historian Jonathan Smith demonstrates, domestic values were strong enough in the later decades of the nineteenth century to override some of these more challenging aspects of Darwin's theory of sexual selection, as laid out in *The Descent of Man, and Selection in Relation to Sex* (1871).[49]

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[46] 'Birds in Their Homes'.
[47] 'The National Collections of Natural History'.
[48] 'The National Collections of Natural History'.
[49] Jonathan Smith, 'Picturing Sexual Selection: Gender and the Evolution of Ornithological Illustration in Charles Darwin's *Descent of Man'*, in Ann B. Shteir and Bernard Lightman, eds, *Figuring It Out: Science, Gender, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2006), 88-89.

In addition to the insistence on pair bonding seen in the cases and popular interpretations of evolution, anthropomorphic tendencies in regards to vocation arise in Victorian ornithological discourse, specifically regarding 'bird architecture'. In his eponymous study of 1844, James Rennie explored the variations within birds' chief '*business* of their lives': nest-building.[50] Rennie labels birds 'masons, carpenters, and tailors', as well as miners, cementers and even, for example in the case of the cuckoo, 'parasite-birds'. In the mid to late century, birds were subject not only to gender norms, but also to expectations of class.[51]

Feathered Gems

Where did hummingbirds fit in according to such gendered and classed conceptions within popular science and museum display? How did their particular 'avian iconography'[52] compare with other taxidermic bird models, specifically that of the naturalistic 'lessons' taught by the bird groups? Gould's dense cases of exotic hummingbirds from the Americas, dotted prolifically along the centralised, vertically-orientated ornamental foliage, feature a patently distinct display strategy from the British bird groups of families set against naturalistic backdrops complete with rocks, grass, water and droppings. The claustrophobically abundant hummingbird case marked a tradition dating back to the birds' newfound popularity among collectors earlier in the century. As Judith Pascoe writes in her study on hummingbird cabinets and romantic collecting practices, 'Collectors signaled the hummingbird's particular appeal as bijouterie by building display cases for them in isolation from other bird cabinets.'[53] A large cabinet in the Natural History Museum dating from the early century features an overwhelming array of specimens and species perched in a range of poses to show off their

[50] James Rennie, *Bird-Architecture* (1844), rev. edn (London: G. Cox, 1853), 19. Emphasis in original. John Ruskin similarly called the bullfinch an architect, and compared his nest to Gothic architecture. Ruskin, *The Eagle's Nest: Ten Lectures of the Relation of Natural Science to Art* (London: George Allen, 1872), 58-59.
[51] For more on birds and class in the eighteenth century, see Emma C. Spary, 'Codes der Leidenschaft: Französische Vogelsammlungen als eine Sprache der vornehmen Gesellschaft im 18. Jahrhundert', in Spary and Anke te Heesen, eds, *Sammeln als Wissen. Das Sammeln und seine wissenschaftsgeschichtliche Bedeutung* (Göttingen: Wallstein, 2001), 39-61.
[52] Morris, 54.
[53] Judith Pascoe, *The Hummingbird Cabinet: A Rare and Curious History of Romantic Collectors* (Ithaca: Cornell University Press, 2006), 34.

plumage, with the 'pseudo-natural prop' of a tree branch (fig. 4.15).[54] Although like this cabinet Gould's cases were constructed earlier than the bird groups, they were deemed relevant to the Museum's displays and were celebrated additions to the collection in the 1880s context.

Gould's hummingbird cases share some resemblance with displays of exotic birds commonly kept in middleclass Victorian private dwellings. Arranged in rectangular vitrines or under glass domes, the object of such cases was to feature a profuse assortment of beautiful, colourful, exotic birds, without regard for taxonomic consistency of species or naturalistic accuracy of setting. In domestic displays from the period, myriad species from several different continents were grouped together (fig. 4.16). Hummingbirds were particularly popular in this type of arrangement for their vivid colours.[55] However, in contrast to these decorative displays, Gould's cases appear methodical, by showing like species together, in varied poses, and including nests and foliage, even if these details were not necessarily accurate to the species.[56] In the guide to Gould's collection, Bowdler Sharpe wrote:

> From an early period he began to mount with his own hand the most remarkable types, placing as much as possible allied forms in the same case, and demonstrating their habits and chief characteristics, and especially the ever-varying hues of their colours, by the different attitudes in which he arranged the specimens.[57]

Norms for exhibiting preserved hummingbirds may also relate to understandings of characteristics of the animals themselves. Naturalists' studies such as John Gould's placed hummingbirds apart from other bird families. Comparisons were regularly made to insects, on account of their miniature stature – 'Lilliputian', as described by the writer Lady Emmeline Stuart-Wortley – and the vibratory buzz of their wingbeats.[58] 'In their disposition they are unlike birds, and approach more nearly to insects,' Gould claimed.[59] Naturalist Henry Walter Bates elaborated, 'The want of expression in their eyes, the small degree of

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[54] Peter James Palmer Whitehead and Colin Keates, *The British Museum (Natural History)*. (London: Philip Wilson, 1981). The origin of the cabinet is disputed. Whitehead and Keates write that the case was probably in the sale catalogue for William Bullock's museum in Piccadilly (the Egyptian Hall), in spring 1819, though research in the NHM archives suggests that this was a different case. Daisy Cunynghame, NHM Archives, email correspondence (28 Jan. 2013).
[55] Morris, 56.
[56] Joanne Cooper, curator of ornithology, Natural History Museum, Tring, personal communication (29 Sept. 2011).
[57] Bowdler Sharpe with Albert Günther, 1.
[58] Quoted in Gould, *Introduction*, 26.
[59] Gould, *Introduction*, 12. Also see Alfred Russel Wallace, 'Humming-Birds', *Fortnightly Review*, no. 22 (July-Dec. 1877), 775.

versatility in their actions, the quickness and precision of their movements, are all so many points of resemblance between them and insects.'[60] At the same time, Gould and others compared the incredibly fast vibrating mechanism of hummingbirds' wings that enabled their unique style of hovering to machinery.[61] These insectile and machinic implications were not necessarily complimentary. Fearless like moths, hummingbirds were pugnacious and irritable, according to Gould, who cited their tendency to attack much larger birds of prey and even humans.[62] 'Their intellect seems to be of a low order,' claimed Bowdler Sharpe.[63]

Surprisingly little is written – and, likely, was known – regarding the birds' mating habits, but in *The Descent of Man*, Darwin suggested that they might be polygamous.[64] In his *Dictionary of Birds* of the 1890s, Alfred Newton wrote, 'The solicitude for her offspring displayed by the mother is not exceeded by that of any other birds, but it seems doubtful whether the male takes any interest in the brood.'[65] Such behaviour presented a stark contrast with the pair bonding and resultant adored and idealised familial scenes presented in the British bird groups.

Rather than the domestic examples they set, hummingbirds were valued chiefly for their jewel-like qualities, as encountered in traditional models of display. Rarely was ink spilt on the birds without the inevitable comparison to gemstones: '[O]rnithologists have been compelled to adopt the vocabulary of the jeweller in order to give an idea of the indescribable radiance that so often breaks forth from some part or other of the investments of these feathered gems.'[66] Gould called hummingbirds 'living gems', quoting earlier naturalists the Comte de Buffon and Charles Waterton's evocations of rubies, emeralds and topaz.[67] Newton praised the 'dazzling splendour that radiates from the spots where Nature's lapidary has set her jewels', and claimed that 'there is hardly a precious stone – ruby, amethyst, sapphire, emerald, or topaz – the name of which may not

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[60] Henry Walter Bates, *The Naturalist on the River Amazons*, 2 vols (London: John Murray, 1863), 183.
[61] Gould, *Introduction*, 13, and the Duke of Argyll, George Douglas Campbell, *The Reign of Law* (London: A. Strahan, 1867), 175.
[62] Gould, *Introduction*, 12, 21.
[63] In Günther, *The History of the Collections*, vol. 2, 5.
[64] Charles Darwin, *Descent of Man and Selection in Relation to Sex* (1871) (London: Penguin, 2004), 254. Darwin suggested that birds with the most variation between sexes were often polygamous. Darwin, *Descent*, 255.
[65] Alfred Newton, *A Dictionary of Birds* (London: Adam and Charles Black, 1893-96), 451.
[66] Newton, 446.
[67] Gould, *Introduction*, 24, 26.

fitly, and without exaggeration, be employed in regard to Humming-birds'.[68] Owing to the combination of their unique movement with their glittering hues, Alfred Russel Wallace, Darwin's fellow theorist of natural selection, saw the hummingbird as 'a breathing gem, a magic carbuncle of flaming fire'.[69] The iridescence of hummingbirds' feathers resulted in their glowing colours changing before one's eyes: 'See it darting through the air… it is now a ruby – now a topaz - now an emerald – now all burnished gold!'[70] Naturalists were able to conceive of the creatures as at once vibrating with life, even shapeshifting, and petrified in their beauty.[71]

Although the common association with precious stones was inspired by the hummingbird's combined minuteness and brilliant plumage, it was equally owing to the bird's rarity and exoticism within the history of European naturalism and geography of continental Europe and the British Isles. Upon the original display of Gould's cases at the Great Exhibition, *Punch* magazine, purveyor of all things satirical, expressed genuine awe at the 'hundreds of Koh-i-noors in feathers'.[72] As a recent addition to Western naturalism, the bird represented a conquest comparable to the giant diamond, recently seized from India and simultaneously on display, among other triumphs in the Great Exhibition's celebration of British Imperialism.[73]

Hummingbirds' shapeshifting, jewel-shifting capacity combined with their exotic origins tinged their profile in nineteenth-century scientific writing with near-mythical status. A newspaper review of the Natural History Museum cited a Native Mexican belief that the souls of dead warriors lived on in the tiny creatures.[74] However, as Wallace noted, even modern Northern naturalists came up with fantastical English names suitable for the various genera, including 'Sun-gems, Sun-stars, Hill-stars, Wood-stars, Sun-angels, Star-throats, Comets, Coquettes, Flame-bearers, Sylphs, and Fairies'.[75] In accord with their uncanny

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[68] Newton, 446.
[69] Attributed to Thomas Nuttall, in Wallace, 774.
[70] Waterton in Gould, *Introduction*, 26. As iridescence is structural rather than pigment, it enables preservation of the birds' colour. Cooper.
[71] For a thorough analysis of this paradoxical conception of hummingbirds, see Ellery Foutch, 'Arresting Beauty: The Perfectionist Impulse of Peale's Butterflies, Heade's Hummingbirds, Blaschka's Flowers, and Sandow's Body', Ph.D. diss. (University of Pennsylvania, 2011), 93-166.
[72] *Punch* 20 (1851), 229, quoted in Foutch, 170.
[73] Ian Balfour, *Famous Diamonds* (London: Collins, 1987).
[74] 'The National Collections of Natural History'. This idea was probably taken from Charles Dickens' review of the cases thirty years earlier. Dickens, 'The Tresses of the Day Star', *Household Words* 3.65 (1851), 290.
[75] Wallace, 776.

mechanism of flight, the birds were said to 'seldom or never alight on the earth', or as Gould put it, 'live in air'.[76] Without exception, it was believed, their tails consist of ten feathers, their eggs always two in number.[77] Their diminutive eggs, fittingly, were likened to pearls; their tiny, delicate nests, woven from spider webs, cotton wool and lichen, were compared to fairy-work.[78] On Gould's hummingbirds in the new Natural History Museum, Flower wrote, 'The resplendent colours and infinite varieties of form presented by these fairy-like objects must always excite feelings of admiration and wonder in all who gaze upon them.'[79] Like fairies, hummingbirds were tricky to capture and confine – 'Liberty is to them life.'[80] Together, their eccentric and fantastical characteristics – including polyamorous inclinations, erratic behaviour, flamboyant displays and exotic origins – painted them as singular among birds in their fierce individualism.

A Transcript of Nature

Such were the 'charming mysteries' that John Gould claimed drew him to begin collecting hummingbirds in the mid-1840s.[81] He wrote he was incited to pick up the study following the death of the Hackney-based naturalist George Loddiges, who previously held what was considered the first and finest hummingbird collection in Europe, and with whom Gould felt 'kindred spirits'.[82] By 1849 Gould had begun work on *A Monograph of the Trochilidae*; it would take him twelve years to complete. Gould was already widely known for his ornithological work, including the early *A Century of Birds from the Himalaya* (1832), his descriptions of finches for *The Zoology of the Voyage of H.M.S. Beagle* (1838-43) and *The Birds of Australia* (1840-48). Illustrations in the latter, as with many of Gould's earlier publications, were lithographed jointly with Gould's wife Elizabeth. However, it was only after Elizabeth's death in 1841 that he discovered

[76] Bowdler Sharpe, *Guide to the Gould Collection*, 4; Gould, 13.
[77] Bowdler Sharpe, *Guide to the Gould Collection*, 4.
[78] *Daily Telegraph* (13 Apr.1887), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives; Newton, 451.
[79] Flower, *General Guide* (1886), 29.
[80] Bowdler Sharpe, *Guide to the Gould Collection*, 6.
[81] Gould, *Introduction*, i.
[82] Tree, 158; Gould, *Introduction*, i.

what his biographer Penelope Tree calls his 'lifelong obsession' with hummingbirds.[83]

Gould's collecting and illustration took place in conjunction with one another: his mounted specimens provided the models for his drawings.[84] However, his own artistic ability has been challenged repeatedly. He employed several illustrators, including Henry Constantine Richter, Edwin Charles Price and William Matthew Hart, to make the patterns for the lithographic plates for *A Monograph of the Trochilidae*. Charles Dickens claimed that in the Goulds' husband-wife team, John was the scientist, Elizabeth the artist.[85] Historian of art and science Julia Voss describes Gould's studio as a factory-like operation, in which his role was largely to correct the work of others, leading to rumours of his lack of drawing skills.[86] An anecdote by John Guille Millais recounting a visit with his father John Everett to Gould's house during which the aged ornithologist pretended to be working on a hummingbird drawing of which he was clearly incapable supports this theory.[87]

Whatever Gould's level of skill or involvement in his drawings, his demonstrated talent for presentation and self-promotion gained him a reputation as a 'master showman'.[88] Nevertheless, as reflected in the hummingbird cases' unique combination of aesthetics and taxonomy, Gould employed his showmanship to debatably scientific ends. *A Monograph of the Trochilidae* was the most ambitious endeavour yet to systematically classify the hummingbird family. It became the definitive reference work for naturalist and layperson alike, and cemented the subject for scientific study.[89] Lavishly illustrated and issued in five parts, the *Monograph* was both impressive and costly.

Just as his taxidermy cases demonstrated idiosyncratic treatment, the hummingbird lithographs appeared to warrant to Gould a type of illustration uniquely their own (fig. 4.17). He developed and patented a special method for conveying iridescence in the Trochilidae's plumage: this consisted of gilding the illustrations, then painting over the gold leaf with transparent oil glazes and

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[83] Tree, 157.
[84] Bowdler Sharpe, *Guide to the Gould Collection*, 2.
[85] Dickens, 289.
[86] Julia Voss, *Darwin's Pictures: Views of Evolutionary Theory, 1837-1874*, trans. Lori Lanz (Ann Arbor, MA: Yale University Press, 2010), 34-36.
[87] John Guille Millais, *The Life and Letters of Sir John Everett Millais* (Toronto: G.N. Morang, 1900), 170.
[88] Tree, 175.
[89] Tree, 163.

coloured varnishes.[90] In an introduction published separately from the *Monograph* – undoubtedly because the latter was well beyond the average person's budget – he highlighted this technique's aptitude for capturing the birds' 'glittering hues', and shrugged off accusations that he had appropriated it from the American hummingbird enthusiast William Lloyd Baily.[91]

The jewelled effect elevated the preciousness of the *Monograph*, for which Gould sought after wealthy subscribers, including Queen Victoria, the Queen of Saxony, the Princess of Wied and the Prussian Crown Princess; in time virtually all of the royal houses of Europe became subscribers.[92] The sumptuousness of Gould's hummingbird illustrations may have drawn associations with royalty and promoted Gould's talents; however, it equally attracted criticism from members of the scientific community, who deemed the drawings extravagant – too beautiful to be truly scientific.[93] Much like the birds themselves, they seemed excessive in their beauty and therefore suspect. As Tree writes, 'The illustrations were simply too attractive, too colourful, and too lavish to serve the purpose of description alone.'[94]

Drawn from specimens mounted by Gould himself, the lithographs of the *Monograph* comprise slightly awkward, heavily idealised, if meticulously realised vignettes. Typically, they illustrate species with birds in varying numbers, frequently three, and like the cases feature a preponderance of males with their vibrant colouring, set against minimal backgrounds of tropical foliage and blue sky or gentle sunrise (fig. 4.18). Where more background is indicated, it fades into a gentle wash of colour; each scene fades around the edges into an oval composition. With the exception of the typical hovering-feeding pose, there is little indication of the birds' activities. As in Gould's cases, it appears the main object is to show the hummingbirds' plumage from various angles.

Gould's hummingbird illustrations appear a paradisiacal vision, with little grounding in taxonomy or behaviour. They produce a marked contrast with other popular scientific illustrations of the birds, for example those by the American

[90] Tree, 164.
[91] Gould, *Introduction*, iii.
[92] Tree, 164. Gould named one species *Eugenia imperatrix* after Napoleon III's wife, Queen of France.
[93] *Ibis* 4.13 (1862), 73-74. The author cites complaints about the expense of the illustrations, which 'might have been otherwise better employed in the cause of science', and criticises Gould's labelling of species and genii.
[94] Tree, 163.

painter Martin Johnson Heade.[95] In his celebrated paintings, Heade executes highly detailed naturalistic, if not fully accurate, scenes of happy hummingbird couples against atmospheric settings (fig. 4.19). Art historian Jane Munro calls them 'fictionalised artefacts'.[96] Often centring on a nest, they commonly show the male presenting his wingspan and the female gazing in admiration. Echoing the body language of the nesting birds in the Natural History Museum, they present a more gender normative vision of hummingbird behaviour than in Gould's male-heavy decontextualised vignettes. Perhaps more revealing, however, is a comparison between Gould's illustrations of hummingbirds and of other birds, for example in his earlier *Birds of Australia* or later *Birds of Great Britain* (1862-73) (figs 4.20, 4.21). In these works, birds from the exotic emu to the native great bustard are shown in dioramic perspective, set against evocative landscapes and in the context of domestic life in scenes that resonate with the Museum's British bird groups, for example with the female bustard snuggling her chicks under her wing while the male fans his tail in display.[97] They present a stark contrast with the non-narrative and highly aestheticised hummingbird illustrations and their individualised specimens drawn from Gould's hummingbird cases.

The exhibition in close proximity to the Crystal Palace of twenty-four glittering uniform cases filled with ornithological specimens exemplified Gould's typical combination of showmanship and science.[98] A lithograph published in *The Illustrated London News* shows the sumptuous interiors of the 'Humming-Bird House' Gould erected in the Zoological Gardens in Regent's Park (fig. 4.22). Set in rows to facilitate viewing in the round, the gilded cases perch atop intricately carved tables; they are protected from the Great Exhibition's masses of visitors by brass bars, which together with decorative canopies hanging overhead and tiled platforms underlying each table, create elaborate structures surrounding the cases and their miniscule occupants. Accompanying the cases, Gould's hummingbird illustrations were hung along the wall to show off his newly patented technique – and to promote sales of his book.[99] The interior was designed to complement the

[95] For an in-depth analysis of Heade's engagement with hummingbirds, see Foutch, 93-166.
[96] Munro, 263.
[97] Jonathan Smith undertakes an extended critique of Victorian gender norms in Gould's illustrations for Darwin's second edition of *The Descent of Man*, arguing Gould's overly idealised images of birds emphasising domesticity countered Darwin's vision. Darwin replaced Gould for subsequent editions. Smith, 'Picturing Sexual Selection', 85-109.
[98] Gould continued to prepare more cases throughout his life, eventually leaving sixty-two to the British Museum.
[99] Cooper.

metallic sheen of the birds in their cases and dramatically lit to bring out their glimmering colours, just as the birds themselves were angled to highlight their brilliance.[100]

The hummingbird exhibition was a tremendous success, attracting, according to Gould's estimate, 80,000 visitors and garnering an extension negotiated by Gould in another location.[101] In the guide to Gould's collection, Bowdler Sharpe wrote: 'It proved one of the great attractions in London during that memorable year.'[102] Within the context of the Great Exhibition and its celebration of British manufacture and colonial exploit, the hummingbird cases and illustrations fit in as a signifier of British scientific ingenuity, a natural complement to the cultural focus. As Tree argues, they appeared a gift from God – 'a blessing conferred by that ultimate inventor, the Creator himself, on the glorious achievements of Britain's Industrial Revolution'.[103] In a review poetically titled 'The Tresses of the Day Star', Charles Dickens voiced this sentiment: to him the display represented the hand of the divine in nature amid the art and industry celebrated by the Great Exhibition; he proclaimed, 'All contribute to the common Treasury'.[104] On 10 June 1851, the Queen and her family visited the Hummingbird House. Victoria later wrote of her visit that she could not 'imagine anything so lovely' as hummingbirds, with 'their variety, & the extraordinary brilliancy of their colours'.[105]

Tree writes that the display and its reception were suited to the Great Exhibition's spectacle of opulence and ornament: 'Just as the Queen's gigantic diamond was displayed like a bird in a gilded cage, so were Gould's birds arranged in glass cases like the precious stones to which they were so often compared'.[106] Dickens admired the 'feathered jewels still glittering in our vision'. He praised Gould's industriousness in forming such a 'wondrous collection' and his taxidermic aptitude to imbue it with 'almost a lifelike variety':

> They hang amidst *fuchsia* flowers, or float over beds of *bromelia*. They sit in their nests upon two white eggs, ready to disclose their 'golden couplets'. They dart long beaks into deep, tubular, flowers, hovering

[100] Tree, 175.
[101] Tree, 174, 176.
[102] Bowdler Sharpe, *Guide to the Gould Collection*, 1.
[103] Tree, 177.
[104] Dickens, 291. Written with Charles Knight, Dickens probably only retouched some passages, edited and wrote the conclusion. Harry Stone, ed., *The Uncollected Writings of Charles Dickens: Household Words 1850-1859*, vol. 1 (London: Penguin, 1968), 311.
[105] Quoted in Russell, 62.
[106] Tree, 174.

> beneath the pendant bells. They poise themselves in the air, we hear not the humming of the wings, but we can almost fancy there is a voice in that beauty.[107]

As objects, and as a display, Gould's hummingbirds conjured associations with rare jewels. Yet at the same time, attached to faint wires in flying positions, they were intended to capture a sense of motion and life. Dickens' description of the 'quiet collection sparkling in the sun' contrasted with his evocation of the 'tiny warrior [that] will fight to the death' a few lines earlier.[108] Another reviewer wrote that 'set upon almost invisible wires', they were 'tremulous as when during life they hovered over the blossoms of a Mexican wilderness'.[109]

But for all the love he professed for the 'living gems', the hummingbirds with which Gould dealt were very much dead. A comparison with his collection of hummingbird skins demonstrates the animation that took place in Gould's act of mounting them in lifelike positions contextualised among quasi-naturalistic settings, however veracious either may have actually been (fig. 4.23). Gould had in fact never seen a live hummingbird until 1857 – he outsourced the collection of specimens to collectors in the Americas who captured and preserved the birds with methods he deemed acceptable.[110] Bowdler Sharpe wrote that 'the energy and enthusiasm of John Gould overcame all obstacles; he lost no opportunity of acquiring, at any cost, species not represented in his collection; he incited by high rewards travellers to go specially in search of rare or unknown species'.[111] Recalling a visit once the collection was reinstalled in Gould's drawing room in Bloomsbury, the writer and ornithologist W.H. Hudson wrote:

> I shall never forget the first sight I had of the late Mr. Gould's collection of humming-birds (now in the National Museum), shown to me by the naturalist himself, who evidently took considerable pride in the work of his hands. I had just left tropical nature behind me across the Atlantic, and the unexpected meeting with a transcript of it in a dusty room in Bedford Square gave me a distinct shock. Those pellets of dead feathers, which had long ceased to sparkle and shine, stuck with wires – not invisible – over blossoming cloth and tinsel bushes, how melancholy they made me feel![112]

In Hudson's account, the verity of his first-hand experience is contrasted against the pale facsimile, or 'transcript' of tropical nature of which Gould is capable, an old-world armchair ornithologist in the face of Hudson's avid adventurer-

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[107] Dickens, 289.
[108] Dickens, 291.
[109] *The Times*, Quoted in Tree, 175.
[110] Tree, 161.
[111] Bowdler Sharpe, *Guide to the Gould Collection*, 1.
[112] W.H. Hudson, *Idle Days in Patagonia* (New York: Dutton, 1917), 180.

naturalist. The hummingbird cases fell short of the realism so remarked on in the British bird groups at the Natural History Museum. Hudson charged Gould with a magpie-like addiction, driven by materialistic possession and avarice. Gould hoarded hummingbirds, unlike his other bird and egg collections, refusing to sell any specimens.[113] Hudson labelled his attitude toward natural history 'a necrology'.[114]

While Dickens praised the rags-to-riches tale presented by Gould – a gardener's son whose passion and industriousness led him to 'take rank amongst the best naturalists of his age', attracting royal patronage across Europe – Tree compares the ageing ornithologist to a Dickens character, retreating into a private world of neurosis and self-obsession.[115] The Dickensian miser was a far cry from the incapacitated but engaged family man John Everett Millais came to depict in his painting *The Ornithologist*, also known as *The Ruling Passion* (1883) (fig. 4.24). Although not an actual portrait of Gould, Millais was inspired by his visit with the ageing ornithologist shortly before his death, but details such as the doting family were pure elaboration.[116] In his transformation of the encounter into a moral allegory representing the pure passion for nature as divine, the birds marking spiritual ascension, Millais cast Gould himself in a scene echoing the 'caring family units' of Gould's illustrations and the Natural History Museum's bird groups.[117] Even so, the heavily domestic scene resonates with that evoked by Hudson: in this feminised space full of women and children, Gould appears as an effete old man, a handler and 'stuffer' of birds whose connoisseurship marks a throwback to pre-evolutionist practices. Millais's son John Guille described his amusement at the invalided ornithologist's 'veneration for his treasures, and the tenacity with which he clung to them', his hands 'trembling with emotion'.[118] Surrounded by dead birds in displays, drawers and spread out on his blanket, the gentleman scholar who transcended his background appears the necrologist, his colourful and exotic specimens shining hard like jewels.

[113] Tree, 210.
[114] Hudson, 180.
[115] Dickens, 289; Tree, 213.
[116] Tree, 215.
[117] Paul Barlow, *Time Present and Time Past: The Art of John Everett Millais* (London: Biddles Ltd., King's Lynn, 2005), 168; Smith, *Victorian Visual Culture*, 94.
[118] Millais, 169.

Ironically, the painting's display at the 1885 Royal Academy inspired John Ruskin, Gould's fellow armchair naturalist, to renounce his lifelong pursuit of mineralogy in favour of hummingbirds:

> I have made a great mistake. I have wasted my life with mineralogy, which has led to nothing. Had I devoted myself to birds, their life and plumage, I might have produced something myself worth doing. If I could only have seen a humming-bird fly, it would have been an epoch in my life! Just think what a happy life Mr Gould's must have been – what a happy life![119]

Ruskin's fanciful imaginings were naïve to the fact that Gould's collecting of hummingbirds shared much in common with his own mineralogical activities: Gould sourced his specimens from afar, according to methods based in financial exchange and taxonomical accumulation, not adventure and a passion for the living animals – it was only at age fifty-two that he even encountered a live hummingbird, shown to him by fellow hummingbird illustrator William Baily at Bartram's Garden in Philadelphia.[120] Gould's experience of the birds was by and large with preserved skins, which he would catalogue, mount and draw, creating his own bejewelled hummingbird universe in his cramped drawing rooms which the cases continued to fill until his death.

The Beauty of Evolution

The ambiguous position of the hummingbird cases in relation to late nineteenth-century aesthetic and evolutionary ideals are echoed within scientific debates of the period. As a bird family relatively recent to science, but one remarkable for its great variety of species – exhibiting a tremendous range of colourful ornamentation – living within a relatively confined geography, the Trochilidae were at the centre of evolutionary debates in the later half of the nineteenth century. As the foremost expert on the hummingbird, Gould was consulted by naturalists from the anti-evolutionist George Douglas Campbell, the eighth Duke of Argyll, to Charles Darwin. Gould maintained that the special ornamentation of hummingbirds was an end in itself, a straightforward manifestation of beauty in nature:

> My own opinion is, that this gorgeous colouring of the Humming-Birds has been given for the mere purpose of ornament, and for no other purpose

[119] Quoted in Tree, 215-16.
[120] Tree, 169.

> of special adaptation in their mode of life – in other words, that ornament and beauty merely as such was the end proposed.[121]

Arguing against Darwin's theory of evolution by natural selection, in *The Reign of Law* (1867), the Duke of Argyll extended Gould's claim for beauty and variety 'for their own sake.'[122] Argyll claimed that 'there is no connexion which can be traced or conceived between the splendour of the Humming Birds and any function essential to their life'.[123] He elaborated on the absurdity of this suggestion:

> A crest of topaz is no better in the struggle for existence than a crest of sapphire. A frill ending in spangles of the emerald is no better in the battle of life than a frill ending in the spangles of the ruby. A tail is not affected for the purposes of flight, whether its marginal or its central feathers are decorated with white. It is impossible to bring such varieties into relation with any physical law known to us.[124]

Argyll reasoned that features so clearly intended to be beautiful must correspond to a divine will. 'Mere ornament and variety of form, and these for their own sake, is the only principle or rule with reference to which Creative Power seems to have worked in these wonderful and beautiful birds.'[125] To Argyll, the objectives of beauty and variety were beyond and superior to nature.

Argyll's argument was based in the pronounced differences between the sexes in most hummingbird species: if their ornamentation was of evolutionary benefit, he argued, then surely both sexes would be so endowed. He wrote, 'The female birds are of course not placed at any disadvantage in the struggle for existence by their more sombre colouring.'[126] This seemingly facile argument was clearly aimed at Darwin's theory of natural selection, the focus of *On the Origin of Species* (1859). Nevertheless, it rightly drew Darwin's attention to the need to elaborate the other mechanism of evolution – sexual selection – which he went on to expand upon in 1871 in *The Descent of Man*.

Darwin conceded that natural selection provided no explanation for the extreme variation between male and female hummingbirds; instead he attributed

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[121] Gould, 18. Also quoted in Argyll, 244. Voss argues that Gould's proclaimed anti-Darwinism was in fact a cover for scientific indifference and a primary concern not to offend some of his more conservative subscribers. Voss, 160. Smith also suggests Gould's sympathies lay with a conservative elite who rejected scientific naturalism and its socio-political implications. Smith, *Charles Darwin and Victorian Visual Culture*, 94.
[122] Argyll, 248.
[123] Argyll, 243.
[124] Argyll, 247-48.
[125] Argyll, 245.
[126] Argyll, 243.

this to sexual selection.[127] Hummingbirds were central in Darwin's delineation of sexual selection in *The Descent*. He deferred to Gould – at least rhetorically – and employed his collection for his argument.[128] But he argued that even if 'ornament and variety is the sole object', as Gould and Argyll insisted, its effect on females, and subsequent production of more offspring, would result in the inheritance of such traits, hence the extreme levels of ornamentation in (male) hummingbirds.[129]

For Darwin, the beauty of hummingbirds played a dual role, both ornamental and utilitarian.[130] However, the aesthetic implications were not of a gift from God unto man, as natural theologians argued, but rather for the enjoyment of birds themselves. Jonathan Smith explains that Darwin's ideas around animal aesthetics were acutely threatening to traditional religious beliefs about beauty and nature, and that even Darwin's supporters had a difficult time accepting the notion that animals were capable of 'taste', 'appreciation' and 'discrimination'.[131] What was especially challenging in the case of hummingbirds and other birds was that such capacity for judgement was bestowed upon the *females* of species, implying uncomfortable levels of agency among female animals. Philosopher Helena Cronin points out that unlike female choice, male competition, the other form of sexual selection, was generally deemed unproblematic, as the characteristics it favoured, including strength, agility, sharp claws and so on, would be advantageous in natural selection anyway.[132] Furthermore, male competition supported the accepted gender stereotypes of male aggression and female passivity. Meanwhile, beautiful but unwieldy and conspicuous traits such as the peacock's tail or the male hummingbird's colourful plumage had no conceivable purpose in natural selection, as Argyll noted, and Darwin's explanation challenged assumptions about which sex was associated with flamboyance and vanity and which one with active and consequential – sexual – decision-making. Hence, contemporary ornithology illustration by Gould and taxidermy displays in the Natural History Museum emphasised more normative Victorian family values while downplaying these challenging gender conceptions.

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[127] Darwin, *Descent*, 497.
[128] Darwin, *Descent*, *passim*.
[129] Darwin, *Descent*, 498, 436.
[130] Munro, 263.
[131] Smith, 'Evolutionary Aesthetics and Victorian Visual Culture', in Donald and Munro, 237, 241.
[132] Helena Cronin, *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991), 114.

Beyond upsetting Victorian gender norms, however, to individuals such as John Ruskin, the utilitarianism of sexual selection appeared as a scorn for natural beauty. Ruskin rejected the term aesthetics altogether, as it degraded beauty to a matter of sensual perception over moral faculty.[133] Leveraging what was a popular argument in the 1860s and 70s, he refused to believe that such profound beauty – and the wonder of life – found in flowers and bird feathers could be attributed to worldly mechanisms.[134] Culminating with a meeting between the two old college acquaintances in 1879, Ruskin went head to head with Darwin on the issue of the peacock's tail feathers, which Gould had compared with the ornamental plumage of male hummingbirds.[135] While Ruskin insisted that such complex patterning found within nature must indicate divine will, Darwin argued that it could not be arbitrary, and – just as Raphael's Madonnas were formed from strategic rather than random daubs of paint – the ocilli of the peacock feather had developed over time according to the natural logic of sexual selection.[136] For Ruskin, Smith writes, Darwin's theory was 'intellectually, spiritually, morally, and aesthetically impoverished'.[137] However, Ruskin was not alone in his resistance to evolutionism's sexual focus, as the selective content of the British nesting birds attested.[138]

During the same time that the aesthetic and reproductive ends of the hummingbird and the peacock were being debated between natural theologians and evolutionists, the peacock feather became one of the central icons of the Aesthetic Movement: numerous artists associated with the movement incorporated the bird in their work – the most iconic example being James McNeill Whistler's ornate murals for *Harmony in Blue and Gold: The Peacock Room* (1876-77) (fig. 4.25) – and Gabriel Dante Rosetti kept live peacocks in his personal menagerie.[139] Oscar Wilde meanwhile regularly referred to the bird's

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[133] See Smith, *Charles Darwin and Victorian Visual Culture*, 26.
[134] Phillip Prodger, 'Ugly Disagreements: Darwin and Ruskin Discuss Sex and Beauty' in Barbara Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 41; see Ruskin, *The Eagle's Nest*, 58.
[135] Prodger, 46-49; Gould, *Introduction*, 18.
[136] Darwin, *Descent*, 142. For a detailed account of Ruskin and Darwin's ongoing debate see Prodger, 40-58.
[137] Smith, *Charles Darwin and Victorian Visual Culture*, 32.
[138] Sally Kohlstedt writes that in contrast to the scientific community's fascination with sexual difference, 'there was self-conscious public reticence about sexual matters and it is possible that ideas of public modesty resulted in neutered specimens'. Kohlstedt, 'Nature by Design: Masculinity and Animal Display in Nineteenth-Century America', in Shteir and Lightman, 120.
[139] Munro, 266.

feathers in outlining his aesthetic philosophy.[140] While the traditional associations of pride and vanity were readily evoked by satirists mocking the effeminate dress and attitudes of adherents of Aestheticism, these enduring debates point to a deeper resonance the symbol might have held concerning the movement's gender and moral politics. Upon Wilde's return from his tour of America, in March 1883 *Punch* published a mock advertisement for 'the whole Stock-in-Trade, Appliances and Inventions of a Successful Aesthete, who is retiring from business. This will include a large stock of faded lilies, dilapidated Sunflowers and shabby Peacock's Feathers'.[141] Whether a divine version of art for art's sake or a form of evolutionary excess, the peacock, not unlike the male hummingbird, presented beauty that was superfluous, even counterintuitive, to survival.

More serious accusations of moral decrepitude lodged against Wilde and Aestheticism generally were rebuked by Wilde in his 1891 essay defining his aesthetic philosophy, 'The Critic as Artist'. Here he argued that 'aesthetic discernment was not merely different from morality, it was superior'.[142] This distinction echoed the debates between the natural theologians who held morality and beauty as mutually informative and evolutionary theorists such as Darwin who proposed an aesthetic order outside of the human and the moral realm. Furthermore, it resonates with the responses to the Natural History Museum's British bird groups, whose 'pretty scenes' were ultimately praised for the 'object lessons' of family values they imparted, despite their ostensible evolutionary narratives, in comparison with the highly embellished, non-narrative displays in Gould's cases featuring the amoral hummingbird.

Meanwhile, sexual selection's disregard for, and sheer flamboyance in the face of the priorities of natural selection as proposed by Darwin, disturbed even his fellow evolutionary theorists' understanding. The most notable detractor of sexual selection was A.R. Wallace. In spite of his shared theory of natural selection, Wallace came to vehemently dispute female choice as a selective force – instead, he argued that the bright colouration in the male of certain birds functioned as an identifier for the means of recognition, while more muted hues in

[140] For example in Oscar Wilde, 'The Critic as Artist', in *The Artist as Critic: Critical Writings of Oscar Wilde*, ed. Richard Ellmann (London: W. H. Allen, 1970), 341-407.
[141] Quoted in Christopher Breward, 'Aestheticism in the Marketplace: Fashion, Lifestyle and Popular Taste', in Stephen Calloway and Lynn Federle Orr, eds, *The Cult of Beauty: The Aesthetic Movement 1860-1900*, exh. cat. (London: V&A, 2011), 203.
[142] Breward, 'Aestheticism in the Marketplace', 199.

the female were for the purpose of protection for incubating eggs.[143] St George Jackson Mivart, an English biologist who was initially a firm believer in natural selection, came to dismiss Darwin's theories of both sexual and natural selection as 'vague, aimless, and indefinite'.[144] Darwin's ideas were indeed contradictory: he argued that the manifest modifications of secondary sexual characters, such as deer antlers and bulky, brightly coloured tail feathers, prove that their benefits override adaptation to environment, suggesting – at least in certain cases – sexual selection was a more powerful force than natural selection.[145] And yet he had previously claimed that it was less rigorous.[146] He was equally ambiguous on the question of aesthetics, arguing that they were specific to the species, but contradictorily using human taste to bear out their appeal, as in the case of hummingbirds, hence inferring an essential beauty.[147] To rationalise this inconsistency, he suggested that our appreciation of other animals' beauty was an evolutionary relic.[148]

Certain feminist critiques maintain that the conflicts between Darwin's theories reveal the influence of Victorian ideology on his thought, and its inevitable tensions with some of his conclusions.[149] However, the ambiguity and unpredictability within nature, its species, generations and sexes is also one of the revolutionary aspects of Darwin's work. Art historian Diana Donald writes that it was in fact 'the very open-endedness of his theories that made them so suggestive to the thinkers and artists of his time'.[150] Rather than a mechanistic version of sexual relations and aesthetics, sexual selection can be understood as pointing towards a remarkable capacity for creativity within nature. As philosopher Elizabeth Grosz explains, unlike natural selection, sexual selection is irreducible to principles of survival and fitness:

> It is a principle of excess in relation to survival. This energetic excess is the condition for the production of biological and cultural extravagance,

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[143] Cronin, 123-24. For a detailed examination of Wallace's refutation of sexual selection, see Cronin 113-64. Cronin demonstrates that while Wallace contributed importantly to understandings of protective colouring, he equally detracted from the importance of sexual selection, to the detriment of evolutionary research for the next century. Cronin, 155.
[144] St George Jackson Mivart, *On the Genesis of Species* (London: MacMillan, 1871), quoted in Prodger, 53.
[145] Darwin, *Descent*, 263.
[146] Darwin, *On the Origin of Species* (1859), ed. Jim Endersby (Cambridge: Cambridge University Press, 2009), 117-18.
[147] Darwin, *Descent*, 115.
[148] Darwin, *Origin*, 254-55.
[149] See, for example, Rosemary Jann, 'Darwin and the Anthropologists: Sexual Selection and Its Discontents', *Victorian Studies* 37.2 (winter 1994), 288.
[150] Diana Donald, 'Introduction', in Donald and Munro, 20.

> the uncontainable production of intensification, not for the sake of the skills of survival but simply because of its force of bodily intensification, its capacity to arouse pleasure or 'desire', its capacity to generate sensation.[151]

It was these principles of excess and pleasure as located in the ornamentation of birds and in particular hummingbirds – producing a vision of nature that is on the one hand amoral and spiritually void and on the other negates ideals of fitness and their teleological ends – that disturbed both theological and evolutionary values. Defying both the non-scientific decorativeness of domestic bird displays and the familial narrative of natural selection in dioramas such as the Natural History Museum's British bird groups, Gould's cases highlight the excessive beauty of the hummingbird and its absence of moral codes.

A Novel Species of Jewellery

To demonstrate the occurrence of sexual selection among hummingbirds, Darwin drew on women's fashion:

> When we behold a male bird elaborately displaying his graceful plumes or splendid colours before the female, whilst other birds, not thus decorated, make no such display, it is impossible to doubt that she admires the beauty of her male partner. As women everywhere deck themselves with these plumes, the beauty of such ornaments cannot be disputed.[152]

In Darwin's statement, two elisions take place, the first being the distinction between the aesthetic preference of the female hummingbird and the female human, the second the end to which this preference is applied – choice of mate or self-adornment. On one hand Darwin aligns women with female hummingbirds in matters of taste, but implicit is the idea that women's penchant for sartorial embellishment with colourful plumage mimics the male hummingbird's evolutionary acquisition of said plumage. Both, it is inferred, involve a goal of attracting the opposite sex.

Darwin was responding to the ubiquitous trend in women's fashion for feathers and even entire birds in the later half of the nineteenth century. After 1850 bird plumage and wings were common features of women's dress, especially

[151] Elizabeth Grosz, *Becoming Undone: Darwinian Reflections on Life, Politics, and Art* (Durham, NC: Duke University Press, 2011), 118.
[152] Darwin, *Descent*, 115.

adorning trims and hats.[153] An advert for the Parisian Hat Company on New Bond Street in the *London Saturday Review* in 1864 features a hat made of 'shaded bird' along with crinoline straw and tulle rosettes (fig. 4.26). The celebrated milliner Madame Tilman, known for elaborate creations featuring preserved birds and insects atop feathers and artificial flowers had branches in Paris and New York.[154] London, however, was the epicentre of feather fashions. Thousands upon thousands of birds collected from all corners of the world were sold annually in the city's commercial salerooms and auctions from mid-century onwards, to be adapted into women's accoutrements.[155] The conservationist William Hornaday called London 'the Mecca of the feather-killers'.[156]

Nevertheless, the phenomenon was widespread and lasted several decades. In 1863, *Godey's Lady's Book*, an American publication, stated: 'The ornithological and entomological fevers, which broke out last spring, will continue with increased violence throughout the winter.'[157] The journalist and specialist on animal products, Peter Lund Simmonds wrote that every year saw an increase in the feather business, with over a million pounds spent within Britain on feathers for ornaments in 1878, on 264,799 pounds of feathers.[158] Feather fashions reached their height between the 1880s and the early years of the twentieth century. 'By 1885' – the same year a woman with what appears to be a whole bird perched atop her hat adorned the cover of Harper's Bazar (fig. 4.27) – the fashion historian C. Willett Cunnington wrote, 'the craving for dead birds had become irresistible.'[159]

During the 'plume boom', hummingbirds were especially popular for their brilliantly coloured plumage and decorative, jewel-like quality. Whole hummers

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[153] Robin W. Doughty, *Feather Fashions and Bird Preservation: A Study in Nature Protection* (Berkeley: University of California Press, 1975), 16; and Lange-Berndt, 47. According to Peter Lund Simmonds, children's hats were also adorned with feathers. Simmonds, *The Commercial Products of the Animal Kingdom Employed in the Arts and Manufactures Shown in the Collection of the Bethnal Green Branch of the South Kensington Museum* (London: Eyre and Spottiswoode, 1880), 48.

[154] See Michelle Tolini, '"Beetle Abominations" and Birds on Bonnets: Zoological Fantasy in Late-Nineteenth-Century Dress', *Nineteenth Century Art Worldwide* 1.1 (spring 2002) <http://www.19thc-artworldwide.org/index.php/spring02/206-qbeetle-abominationsq-and-birds-on-bonnets-zoological-fantasy-in-late-nineteenth-century-dress> accessed 31 Oct. 2011.

[155] For exact figures, see Doughty, and Merle Patchett, 'Murderous Millinery', *Fashioning Feathers: Dead Birds, Millinery Crafts and the Plumage Trade*, online exhibition <http://fashioningfeathers.com/murderous-millinery/#_ftn1> accessed 5 Mar. 2013.

[156] William T. Hornaday, *Our Vanishing Wildlife: Its Extermination and Preservation* (New York: New York Zoological Society, 1913), 117.

[157] Quoted in Tolini.

[158] Simmonds, 48, 45, 47.

[159] C. Willett Cunnington, *Feminine Attitudes in The Nineteenth Century* (London: William Heinemann, 1935), 250.

formed whimsical embellishments on hats, trim and other accessories. Ladies' fans of the 1870s and 80s featured the birds mounted as if in flight, set against down and feathers from other exotic birds, and nestled amid artificial flowers – also made of feathers – with shiny preserved beetles (figs 4.28-4.30). Manufactured in Brazil to be sold to wealthy customers in the UK and elsewhere, such objects presented a 'zoological fantasy', to use art historian Michelle Tolini's term[160] – a miscellany of preserved and artificial specimens, producing flora-fauna composites. A 'flower spray' of 1894 with petals and leaves made from coppery-headed emerald hummingbird feathers and the flower's centre from Indian beetle wings provides a similarly hybrid simulacrum (fig. 4.31).

Inevitably, the 'feathered gems' were employed in jewellery. Brooches, earrings and necklaces were made out of hummingbird feathers and various body parts. In 1865, *The Queen, The Lady's Newspaper* reported: a 'novelty in jewellery is a pair of humming birds' heads set as ear-rings, the feathers changing colour and glittering more beautifully than any gem'.[161] The earrings in question were by the jeweller Harry Emanuel, who patented his technique for mounting jewellery with bird feathers and plumage, 'preferring those which are celebrated for their varied effects of colour and light' (fig. 4.32).[162] The heads and throats of the ruby-topaz hummingbirds affixed to the earrings' gold frames certainly achieve such effects: the iridescent feathers range from fiery orange to crimson and from gleaming gold to deep emerald with the shift of light. A corresponding necklace by Emanuel alternates emerald green hummingbird heads with scarlet ones; the latter are turned upside-down to capture their shot hues and emphasise the birds' decorative capacity (fig. 4.33).

The protean quality of hummingbirds' plumage, so excitedly described by naturalists and exploited in Gould's cases and illustrations, lent itself perfectly to the context of jewellery. Jewellers such as Emanuel played on this material fluidity by employing cabochons of precious stones for eyes, and replacing beaks with ones made of gold. Like the millinery metamorphoses of feather flowers, the preserved animals are encroached by precious minerals, increasing the opulence

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[160] Tolini.
[161] 'The Newest Things in the Shops', *The Queen, The Lady's Newspaper* (26 Aug. 1865), quoted in Foutch, 144.
[162] H. Emanuel, 'Specification of Harry Emanuel, Ornaments for Personal Wear', Great Britain Patent. No. 1779 (1865), quoted in Gates Sofer, 'Investigation of a Victorian ornithological adornment', *Conservation Journal* 57 (Spring 2009) <http://www.vam.ac.uk/content/journals/conservation-journal/issue-57/investigation-of-a-victorian-ornithological-adornment/> accessed 31 Mar. 2013.

of the specimens. Such jewellery instilled a sense of luxury. Art historian Ellery Foutch writes, 'The birds' delicacy would also emphasize the leisure of their wearer: imagine the impossibility of productive labor while wearing a ring of hummingbird feathers, whose iridescence would be brushed away by contact with other materials.'[163] Indeed, while they offered an affordable alternative to rare jewels, hummingbirds were associated with the upper classes: a writer for the *Art Amateur* outlined the range of consumers of feather fashions, from seagulls and swallows worn by 'the rough' to the hummingbird fringe of 'the great lady'.[164]

Hummingbird jewellery also carried with it the appeal of exoticism, a wearable equivalent to Gould's cases and their associations of South American natural resources and intriguing otherness. The connection between natural history and feather fashions was not simply theoretical: the ornithologist Adolphe Boucarde, who came to publish a monthly journal by the name of *The Humming Bird* from 1891-95 (fig. 4.34), collaborated with Rowland Ward's London taxidermy firm to manufacture jewellery made of bird feathers and beetles from South America.[165] Women's self-adornment with this 'novel species of jewellery'[166] made the evolutionary associations outlined by Darwin and others explicit. It contributed to the trans-species correlations made by such theorists, as well as by manufacturers of these objects, creating a sense of fluidity between the bird-flower-jewels and the women themselves.

Exotic and potentially monstrous, albeit heavily refined, the delicate feather ornaments were nevertheless deemed far superior to those produced from artificial materials. A writer for *Harper's Magazine* declared:

> Feathers must always hold a place far in advance of artificial flowers in decoration of costumes. Flowers are at best but a poor imitation of the reality, while plumes are a genuine and magnificent contribution of nature to man's desire for beautiful adornment.[167]

The author draws on a pseudo-evolutionary argument, with humans as the ultimate beneficiaries of beauty among other species. Author of popular Aesthetic style guides 'Mrs' H.R. Haweis, on the other hand, while not rejecting feather fashions outright, promoted a '"Prae-Raphaelitism" in dress' that embraced

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[163] Foutch, 148.
[164] Mary Gay Humphreys, *The Art Amateur* 7.6 (Nov. 1882), 130.
[165] Charlotte Gere and Judy Rudoe, *Jewellery in the Age of Queen Victoria* (London: British Museum, 2010), 230.
[166] Peter Lund Simmonds, *Science and Commerce: Their Influence on Our Manufactures...* (London: Robert Hardwicke, 1872), 56, quoted in Foutch, 145.
[167] Helen S. Conant, 'Birds and Plumage', *Harper's Magazine* 57.329 (Aug. 1878), 403, quoted in Foutch, 143

Ruskinian truth-to-materials and condemned 'large and gaudy insects' on hats and bonnets along with 'dyed and often mutilated scraps from the commonest fowls – a sight detestable to anyone loving either art or nature'.[168]

Tolini suggests that the use of birds and insects in ladies' fashion ostensibly signalled an opportunity for women to reconnect with the natural world from which they had become alienated following the industrial revolution.[169] This idea corresponds to the belief that the displays in the Bird Galleries enabled London's nature-starved city-dwellers to revive themselves through a trip to the Natural History Museum. And just as women were encouraged to engage in certain forms of natural history collecting, such 'natural' adornment was believed to complement femininity.[170] In 1876 Charles Blanc wrote:

> A bonnet is simply an excuse for a feather, a pretext for a spray of flowers, the support for an aigrette, the fastening for a plume of Russian cock's feathers. It is placed on the head, not to protect it, but that it may be seen better. Its great use is to be charming.[171]

The art critic's consideration of the utilitarian purposes and ultimate aesthetic 'great use' of bird plumage echoes and perhaps even mocks evolutionary discourse discerning the ends of such decoration.

Ambivalence towards Darwinian sexual selection also manifested in visual commentary, such as the cartoons of Edward Linley Sambourne's 1867-76 series for *Punch* titled 'Designs After Nature'. Primarily published in 1871, one of these cartoons lampooning both evolutionary theory and women's fashion appeared in April, the same month *The Descent of Man* was first published (fig. 4.35).[172] The accompanying caption reading 'Grand back-hair sensation for the coming season', the image is of a stylish young woman seen from behind whose hat, parasol and long tresses all mimic the display of the peacock. The bird in fact appears to perch atop her head, its long tail feathers cascading and commingling with the hair falling down her back; as in other cartoons from the series, animal and woman merge. Like Darwin, Sambourne conflates the peacock's plumage with the

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[168] Mrs H.R. Haweis, *The Art of Dress* (London: Chatto and Windus, 1879), 164-65.
[169] Tolini, and Lange-Berndt, 47-48.
[170] See, for example, Charles Kingsley, *Glaucus; Or, the Wonders of the Shore*. 3rd edn (Cambridge: MacMillan and Co., 1856), 47. Tony Bennett also connects the naturalisation of femininity in the nineteenth century to women's role as visitors to the museum, as they were thought to bring the virtue of domesticity to the cultural sphere. Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995), 29.
[171] Charles Blanc, *Art in Ornament and Dress* (1876), (London: Chapman and Hall, 1877), 112, quoted in Tolini.
[172] Susan Bernstein, 'Designs After Nature: Evolutionary Fashions, Animals, and Gender', in Deborah Denenholz Morse and Martin Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 70.

'secondary sex traits' of the female Victorian – crinolines, bustles and elaborate hairstyles.[173] While responding to the latest craze in fashion, whether deliberately or not, Sambourne exposes the transgender/trans-species problem of Darwin's latest theory.

Birds of a Feather

The paradox of Darwinian sexual selection is reiterated in other examples of evolutionary theory and visual culture. Mivart equated women's breasts with the peacock's tail, both unwieldy yet appealing to the opposite sex of their respective species, and both presenting a stumbling block for Darwinian natural selection.[174] The Austrian Symbolist artist Alfred Kubin illustrates this conflation in his drawing of a bourgeois woman – naked save for boots, parasol and hat (complete with feather) – with a giant fanned-out peacock tail (fig. 4.36). With this biological hybrid, Kubin takes the male bird/human femininity equation of Sambourne's earlier cartoon a step further. Titled *Pride* (1900), the image's giant bird-woman transmorphs the notorious vanity of woman with that supposed of its traditional emblem, the peacock. Larger than life, this avian *femme fatale* commands reverence from her relatively scrawny suitors who bow down in her formidable presence.[175] At the turn of the century, the cartoon brings the gender-species transgression of birds and women to its logical conclusion, flipping the peacock feather as a symbol of effeminacy on its head with its masculinised peacock-woman.

Comparisons between women and birds, particularly male birds, were rife in the later nineteenth century. Their assumed commonalities, according to historian of science Emma Spary, trace back to the eighteenth century and were also shared with the upper classes: like birds, both women and aristocrats were deemed 'fickle with an uncontrollable sex drive, dressed up in bright colours and

[173] Bernstein, 70.
[174] Mivart, 47-48, quoted in Prodger, 54.
[175] With his exaggerated nose and frail physique, the man holding flowers appears to be a caricature of a Jew. For more on imagery contrasting masculine weakness with the domineering Amazonian *femme fatale*, see Barbara Larson, 'Darwin's Sexual Selection and the Jealous Male in Fin-de-Siècle Art', in Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 173-93.

always in pursuit of something new'.[176] Darwinian rhetoric was used to explain women's fashions – Mrs. Haweis wrote, 'The need of conspicuousness, which we are told results in the survival of the fittest, is at the root of this love of ornament, a healthy instinct not to be sneered down.'[177] And yet *overly* colourful or ornamented dress was considered gaudy and objectionable.[178] In a chapter titled 'Vulgarity is Excess', Haweis derided overly conspicuous accessorising as 'in the very worst taste'.[179]

Whether on the right or wrong side of taste, female accoutrements became objects of near-scientific scrutiny by the media, providing a fulcrum for processing evolutionary arguments via their pet subjects: birds and women. In an illustration of a conversazione at the Natural History Museum in 1890, a vignette in the upper right corner shows an attractive and fashionably dressed woman peering envyingly into one of the bird group vitrines (fig. 4.37). A caption reads 'Rivals'. The delicate plumes sprouting from the woman's headpiece and shoulders echo those of the creatures in the popular display, and indicates their affinity. Nevertheless, the woman's connoted vanity and pettiness confronted with the mounted birds is witnessed in her longing gaze. Once again, the implied narrative and its resonance with evolutionary survival of the fittest, spurred by rivalry, ensnarls species and gender.

Alongside the ridicule, unease was also expressed about the grisly displays of dead birds in women's fashion. This was especially the case when their carcasses were ostentatiously embellished with opulent gold and jewels, as in the case of hummingbird jewellery, in what would eventually be seen as 'an orgy of Sadism'.[180] Some critics compared the practice of wearing birds to savagery, calling on examples of feathered headdresses and hummingbird necklaces among aboriginal tribes.[181] Such protestations were typical of the backlash against the bird trade that arose in response to the worldwide destruction of millions of birds in the name of fashion – which in some cases threatened extinction. The guide to

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[176] Spary, quoted in translation from the original German in Bernd Brunner, *The Ocean at Home: An Illustrated History of the Aquarium* (New York: Princeton, 2003), 19.
[177] Haweis, 78-79.
[178] See Munro, 279.
[179] Haweis, 124. Overwraught fashion was furthermore associated with foreignness, following Napolean III and Empress Eugenie's revival of the French court in 1852, which ushered in a fashion for fabulous gowns, augmented by lace, ribbons, fringe, feathers and artificial flowers. Stella Blum, ed. 'Fashions in Godey's Lady's Book, 1837-69', in *Fashions and Costumes from Godey's Lady's Book* (New York: Dover, 1985) n.p.
[180] Cunnington, 251.
[181] Humphreys, 130.

Gould's collection in the Natural History Museum commented on one hummingbird species, 'It has for years been sent over to Europe in large quantities for the purposes of decoration of ladies' hats and dresses; and were it not for the extreme abundance of the species it would have been long ago exterminated'.[182] Conservationists were increasingly vociferous in their condemnation of 'murderous millinery'; their vitriol, as filtered through the press, was aimed at the 'feathered women', as W.H. Hudson dubbed them, who demanded the killing.[183] Hornaday blasted the 'cold-blooded industry, supported by vain and hard-hearted women'.[184]

Ironically, the vilification frequently took the form of comparing the women to the birds themselves. In Sambourne's 1898 cartoon *A Bird of Prey*, such 'feathered-headed' women were depicted as winged and clawed predatory creatures (fig. 4.38).[185] But – as Virginia Woolf later argued – the censure of materialistic and predatory women ignored the fact that the hunters and merchants of bird skins were customarily men, while the women purchasing the wearable animals were subject to a patriarchal commercial culture.[186] Meanwhile, women were at the heart of campaigns against murderous millinery, such as the Royal Society for the Protection of Birds, which was founded by Emily Williamson as the Plumage League in 1889.[187] Nevertheless, the female activist, including the anti-vivisectionist and the New Woman, was deemed unwomanly: a 'Darwinian abomination' who transgressed biological principles of feminine attractiveness.[188] Women were doubly condemned: if they engaged in fashion they were frivolous and amoral; if they campaigned against it they were unfeminine.

As with female vivisectionists, emotional reasons are often attributed for women's involvement in anti-feather campaigning.[189] However, these might be

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[182] Bowdler Sharpe, *Guide to the Gould Collection*, 20.
[183] 'Feathered Women' is the title of a pamphlet published by W.H. Hudson as president of the Society for the Protection of Birds, cited in Patchett.
[184] Hornaday, 117.
[185] 'Murderous Millinery', in *New York Times* (31 July 1898), quoted in Patchett.
[186] Virginia Woolf, 'The Plumage Bill' (1920), quoted in Patchett. Woolf compared the torture of birds to injustices to women and in so doing presaged feminist arguments of the later century regarding the othering of women and animals as 'fellow sufferers'. Lynda Birke, *Feminism, Animals and Science: The Naming of the Shrew* (Buckingham, PA: Open University Press, 1994), 12, 16. Also see Carol J. Adams and Josephine Donovan, eds, *Animals and Women: Feminist Theoretical Explorations* (Durham, NC: Duke University Press, 1995).
[187] Patchett.
[188] Munro, 288.
[189] See Patchett, and Bennett, *Pasts Beyond Memory: Evolution, Museums, Colonialism* (London: Routledge, 2004), 113. Similarly Lynn Barber writes that women were more drawn to botany than other natural history fields since it did not involve killing. Barber, *The Heyday of Natural History*,

overstated, reinforcing the stereotype of female sentimentality in the face of masculine science – the fact that such activists endorsed the 'audubonnet',[190] which could be made with domestic bird feathers deemed acceptable, suggests that species extinction was a more important consideration than empathy for individual birds. Prominent male naturalists such as Booth supported stricter game preservation laws, while Flower himself publicly campaigned against feather fashions – he and other representatives of the Natural History Museum lobbied to prohibit the importation of plumage and to protect British birds.[191] The irony of these individuals responsible for so many displays of dead animals taking on conservationist work signifies a belief in noble killing for the purpose of taxidermy. Donna Haraway writes: 'Scientific knowledge cancelled death; only death before knowledge was final, an abortive act in the history of progress.'[192] This self-affirming justification for taxidermy can be witnessed in the celebratory descriptions of the methods for the British bird groups in the Natural History Museum: 'In order to render the groups absolutely true to life, it was an essential condition that both parents, with their eggs or the young belonging to the nest, should be taken.'[193] The same circumstances that ostensibly caused women to protest against feather fashions were sanctified within naturalistic museum displays. Whereas, like feather fashions Gould's less naturalistic and more plainly aestheticised 'pellets of dead feathers', as Hudson described the mounted hummingbirds, drew censure.

A Dandy Subject

According to Foutch, by century's end hummingbirds had become associated with women's collecting pursuits, 'too beautiful and showy to merit serious study'.[194] In 1894 the naturalist Boucarde suggested that 'a collection of humming-birds should be the one selected by ladies. It is as beautiful and much more varied than

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1820-70 (London: Jonathan Cape, 1980), 37. For more on the history of women's involvement in anti-feather and anti-cruelty campaigning, see Barbara T. Gates, *Kindred Nature: Victorian and Edwardian Women Embrace the Living World* (Chicago: University of Chicago Press, 1998), 113-44.

[190] Patchett.

[191] Wonders, 44; Flower, letter to *The Times* (25 June 1896), cited in Stearn, 70; Stearn, 72.

[192] Haraway, 60 n. 26.

[193] Lankester, 31.

[194] Foutch, 159.

a collection of precious stones'.[195] That the ornate cases and decorative arrangements of Gould's displays, to say nothing of the jewel-like creatures within, would have begun to appear unscientific in the contexts of popular fashions and popular taxidermy towards the twentieth century is undoubted. The Natural History Museum verified this unease in the early 1900s by finally painting the gold wooden frames black and adding labels of the birds' scientific names to ensure seriousness (fig. 4.39).

But regardless of their sartorial connection, throughout the nineteenth century the excessive beauty of hummingbirds was not exclusively associated with women. An 1819 engraving by George Cruikshank shows three nattily dressed and impressively coiffed young men playing instruments and singing in an elegantly furnished sitting room (fig. 4.40). The caption reads 'Humming-birds – or a Dandy Trio'. Two of the men drape sinuous limbs over lyre-backed chairs and a Regency chaise longue as they croon to music-books with titles such as 'Our Warbling Notes and Ivory lutes Shall ravish every ear', while the third, a flautist, gazes admiringly into a mirror hanging over the mantelpiece. Flanking the mantel are paintings of a waspwaisted seventeenth-century gentleman and lady (presumably ancestors) and the mythological figures Vacuna, goddess of leisure, and Narcissus, tragic lover of his own reflection. Published at a time when the hummingbird was well on its meteoric rise from obscurity, and the dandy was at the height of ridicule – the English fashion icon and dandyism's arbiter Beau Brummel having fled to France to escape debtor's prison in 1816 – this early cartoon identifies the ostentatious gem-coloured birds with the well-dressed gadabouts.

Although the humour of Cruikshank's print relies largely on the connection of the singing aristocrats to the 'humming' birds (so named after the sound of their wings in rapid motion – they are not song birds in the least), the parallels run deeper. Dandyism is a nebulous phenomenon which does not confine itself to time period, class, social status or sexuality; it is in fact defined by these very vagaries. The one unifying characteristic, according to fashion historian Laura Ugolini, is a 'meticulous and obsessive preoccupation with dress'.[196] In accounts of the nineteenth-century dandy, this tends to involve hours spent daily

[195] A. Boucarde, *Travels of a Naturalist* (London: Pardy and Son, 1894), 13, quoted in Foutch, 159.
[196] Laura Ugolini, *Men and Menswear: Sartorial Consumption in Britain 1880-1939* (Aldershot, UK: Ashgate, 2007), 64.

at one's toilet, frequent meetings with one's tailor, and the utmost prioritisation of one's appearance.[197] Ugolini writes that by end of century the dandy label encompassed 'a wide range of sartorial practices considered more or less aberrant'.[198] However, even following Oscar Wilde's trial and prosecution for acts of indecency and sodomy in 1895, these sartorial practices were not necessarily linked to homosexuality.[199] In fact, the correlation of effeminacy and homosexuality was not established in the Victorian period until Wilde's infamous trial.[200] Nevertheless, the ridicule of dandies – which continued long after the end of the 'anti-dandiacal' movement of the 1830s and 40s – focussed on questionable masculinity.[201] Comparable to the contrasting perceptions of 'feathered women' and anti-feather campaigners, male attention to dress was deemed frivolous while sober clothing indicated seriousness of mind – seen as a virtue in men.[202] In a *Punch* cartoon from 1853, two dandies, or 'cock sparrows', banter over one man's exaggeratedly large bowtie (fig. 4.41). He remarks 'I fancy it is rather grand; but then, you see, I give the whole of my mind to it!' The puffed chests of the men's waist-coated and corseted figures combined with their cocked heads and vacant expressions complete these avian caricatures.

In contrast with such vapid characterisations, the poet, critic and committed dandy Charles Baudelaire extolled the 'heroism' of dandyism as a no less than spiritual pursuit, albeit one that worshipped the 'cult of the ego'.[203] Writing on the legendary Brummel, the English essayist Max Beerbohm upheld the dandy as an artist, his medium his wardrobe and his toilet.[204] The dandy's artistry extended beyond his person to his environment. Considering 'the golden lads, the Dorians, of male homoerotic fiction', literary historian Talia Schaffer describes the dazzling and eccentric men of dandy literature spanning the century

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[197] See Max Beerbohm, 'Dandies and Dandies', *The Works of Max Beerbohm* (London: John Lane, 1896), 2-11; James Laver, *Dandies,* Pageant of History series (London: Weidenfield and Nicolson, 1967), 96; and Henriette Levillain, ed., *L'Ésprit dandy: de Brummell à Baudelaire* (Paris: Corti, 1991).
[198] Ugolini, 64.
[199] Ugolini, 64.
[200] Talia Schaffer, 'Fashioning Aestheticism by Aestheticizing Fashion: Wilde, Beerbohm, and the Male Aesthetes' Sartorial Codes', *Victorian Literature and Culture* 28.1 (2000), 39. Also see Christopher Breward, *The Hidden Consumer: Masculinities, Fashion and City Life 1860-1914* (Manchester: Manchester University Press, 1999), 247.
[201] See Laver, 80.
[202] Laver, 80.
[203] Charles Baudelaire, 'The Painter of Modern Life' (1863), in *The Painter of Modern Life and Other Essays*, trans. and ed. Jonathan Mayne, new edn (New York: Phaidon, 1995), 28, 27.
[204] Beerbohm, 3.

by Benjamin Disraeli, Edward G.D. Bulwer-Lytton, Ouida and others.[205] In Catherine Gore's 1841 novel *Cecil, or Adventures of a Coxcomb* – yet another avian personification – the effeminate Bertie Cecil reclines on luxurious piles of fur and Turkish cushions, surrounded by perfumes, flowers, silver and ivory toys in a room lined with silken rose-coloured hangings.[206] Such spaces signified the class ambitions of the dandy and his connections to aristocracy, whether true or feigned, as well as gender transgression, with the decoration of the home traditionally designated a woman's activity.[207] Cecil is a predecessor to Wilde's materially exquisite and morally abhorrent title character of *The Picture of Dorian Gray*, published fifty years later. The lavish interiors belonging to these magpie characters of immaculate taste were actualised in the Aesthetic interior, for example in the *Peacock Room* by Whistler, another dandy, with its characteristic sumptuous surfaces, extreme ornamentation and Asian pottery. As similar decoration became increasingly commonplace in bourgeois homes in the 1880s and 90s – in particular with Japanese, Moorish and other exotic bric-a-brac – 'art' was transferred to the domestic interior,[208] in what might be seen as the dandyification of society.

While dandyism and Aestheticism are not synonymous – dandies eschewed the exaggerated exotic and anachronistic styles of Aesthetic dress[209] – the gender politics of the two tendencies were intertwined. 'In the Aesthetes' desire to beautify everyday life, they moved into areas that had historically been associated with women: the decoration of homes and bodies,' writes Schaffer.[210] She notes that in their historically influenced costumes that emphasised masculine embellishment while dispensing with female corsetry, male Aesthetes dressed like women and female Aesthetes dressed like men: 'the visual effect on the average Briton was to confound two centuries' worth of separate-sphere ideology.'[211] As the Aesthetic Movement spread from high culture to low in the 1880s, mockery and fears of effeminacy manifested in satire and were expressed by artists,

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[205] Schaffer, *Forgotten Female Aesthetes: Literary Culture in Late-Victorian England* (Charlottesville, VA: University of Virginia Press), 124.
[206] Schaffer, *Forgotten Female Aesthetes*, 124.
[207] On dandyism and class mobility in regards to sexuality, see Breward, *Hidden Consumer*, 247-49. On the shifting gender politics of interior decoration, see Deborah Cohen, *Household Gods: The British and Their Possessions* (New Haven: Yale University Press, 2006), 89-121.
[208] Cohen, 68.
[209] Laver, 87-92.
[210] Schaffer, 'Fashioning Aestheticism', 40.
[211] Schaffer, 'Fashioning Aestheticism', 44.

including by Whistler himself.[212] W.S. Gilbert and Arthur Sullivan's comic opera *Patience*, first performed in London in 1881, satirised the perceived vacuity and self-indulgence of the Aesthetic Movement. The play's accompanying programme and sheet music featured Aestheticised men donning tights and histrionic poses and an Aesthetic maiden in a 'high art' peacock dress (fig. 4.42).[213] Particular disdain was lodged against Wilde's outlandish costumes; even before his downfall his 'radical "art for art's sake" dandyism seemed evidence enough of moral bankruptcy and sexual disgrace'.[214] Aesthetic immorality was conflated with the collapse of sexual difference.[215] As dress historian Christopher Breward writes, behind the mockery lay 'discernible horror at the incipient effeminacy suggested by the whole Aesthetic Movement, its inevitable lapse into degeneracy and decadence'.[216]

In a bird-saturated culture, the proud posturing that typified the dandy and the strong colours and sumptuous fabrics adopted in Aesthetic male wardrobes inevitably led to associations with birds. But while the peacock feather became the symbol of Aesthetic decadence, the hummingbird, as understood and visualised in late nineteenth-century scientific culture, might present a better metaphor. Hummingbirds were regarded as aesthetes – some species were even called Fops. In addition to being 'extremely ornamented' with brilliant plumage and attractive embellishments such as ear tufts, neck-frills, and leg cuffs, they were known for producing exquisite nests out of various materials – according to Darwin, they decorated them out of aesthetic appreciation![217] According to their 'architecture' then – the 'smallest and prettiest' of bird nests – they would perhaps be best classed as the aristocrats of class Aves.[218] Beerbohm called dandyism 'the perfect flower of outward elegance', his language echoing naturalists' descriptions of hummingbirds.[219] Like the male hummingbird's elaborate display for the sake of potential mates – 'performance', as Darwin termed it – the dandy engaged in

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[212] Breward, 'Aestheticism in the Marketplace', 199.
[213] 'Sheet music cover by Hanhart entry', *V&A: Search the Collections* <http://collections.vam.ac.uk/item/O1159413/sheet-music-cover-hanhart/> accessed 22 July 2015.
[214] Breward, 'Aestheticism in the Marketplace', 203.
[215] Cohen, 81. Also see Caroline Arscott, *William Morris and Edward Burne-Jones: Interlacings* (New Haven: Yale University Press, 2008), 11-13.
[216] Breward, 'Aestheticism in the Marketplace', 200.
[217] Darwin, *Descent*, 436, 115.
[218] Rennie, 215.
[219] Beerbohm.

presentation as spectacle.[220] And as the 'ravishing notes' of Cruikshank's trio suggest, the goal was likewise to woo the female of the species.[221] Nevertheless, according to Beerbohm, the ideal dandy remained unmarried and childless, as the responsibilities of a wife and children would inevitably disturb his total devotion to his art.[222] Dandyism's eccentric individualism recalls the absent father role of the male hummingbird, to whom 'liberty is life'.

Such eccentric individualism is also reminiscent of Gould. While neither dandy nor Aesthete, Gould comes to represent a hummingbird-like figure in his own impetuousness, slyness and hoarding of beauty. The unidealised reality that lay behind Millais's painting of Gould surrounded by dozens of cases full of *dead* feathered gems, provides a necrophiliac natural history counterpart to the materialistically amoral heroes of dandy and Aesthetic literature. From the first time his 'admiring gaze' encountered a hummingbird – in fact a preserved specimen, one must remember – Gould described 'with what delight did I examine its tiny body and feast my eyes on its glittering plumage!'[223] The naturalist, taxidermist and illustrator's greedily connoisseurial gaze was present at every step of his work. While providing models for study, the hummingbirds he prepared and displayed in gilded cases amid artificial foliage and colourful wax flowers were equally 'ornaments for the drawing-room' – much like the Blaschkas' 'ornaments for elegant living rooms' – and this was exactly what they ended up in the final decades of his life.[224] Notwithstanding Hudson's charge, Gould could be viewed as more hummingbird than magpie.

Conclusion

Despite their popular success, the cases eventually became an embarrassment for the Natural History Museum, evidenced by the institution's attempt to diminish their gilded ostentation with black paint and augment their scientific relevance with Latin. However, these gestures failed to detract from the 'aesthetic interiors'

[220] Darwin, *Descent*, 497; Susan Fillin-Yeh, 'Introduction: New Strategies for a Theory of Dandies', in Fillin-Yeh ed., *Dandies: Fashion and Finesse in Art and Culture* (New York: NYU Press, 2001), 2.
[221] Ugolini writes that dandyism was commonly associated with heterosexual men who were attractive to women. Ugolini, 64.
[222] Beerbohm.
[223] Gould, *Introduction*, i.
[224] Gould, *Introduction*, 3.

of the cases. Inside, the iridescently colourful, mostly male specimens mingled claustrophobically amid fake tropical plants. These flamboyant creatures with their displays' strange ahistoricism, in between the parlour ornaments of popular natural history and the evolutionary diorama, equally found themselves in a liminal position concerning gendered display. Although in his 'woolliness' concerning sexual selection Darwin insisted that in humans the relationship of the sexes in other animals was reversed, with women as the passive objects of admiration, many men challenged the role that had been cast for them as the plainer sex.[225] On dandyism, Baudelaire wrote, 'It is, above all, the burning desire to create a personal form of originality, within the external limits of social conventions.'[226] In spite of Gould's conservatism, by continuing to play the role of jewels, the hummingbirds echoed this borderline transgression. Whether alive in the Amazon, mounted in Gould's elaborate cases or accessorised in ladies' fashions, the tiny creatures symbolised pleasure and aesthetic excess – points that produced discomfort within late nineteenth-century natural history among evolutionists and natural theologians alike. These associations segregated the hummers in their jewellery box-like displays from other birds contained by naturalistic yet heavily anthropomorphic projected narratives. In their artfulness, they signalled shared traits with humans; unwittingly, the cases were therefore suitable illustrations of Darwin's theory of sexual selection. They signified the uncontainable creativity of nature and its fluidity with human conceptions of beauty and display. Resisting the gender tropes of Victorian evolutionism, they parallel the inherently changeable and ambiguous dandy, who blurred lines of social and economic status, gender and sexuality. As the twentieth century approached, the bird-woman analogy and its lapse with the insectile, machinic, dandyish hummingbird gave way to the insect-woman nexus as the feminine political threat to the British Empire mounted and the fantasy of the *femme fatale* reached its peak.

[225] Munro, 276.
[226] Baudelaire, 27.

CHAPTER FIVE

A New Paradigm: Metamorphosis and Mimicry in the Insect Gallery

> I trembled with excitement as I saw it coming majestically towards me, and could hardly believe I had really succeeded in my stroke till I had taken it out of the net and was gazing, lost in admiration, at the velvet black and brilliant green of its wings, seven inches across, its golden body, and crimson breast. It is true that I had seen similar insects in cabinets at home, but it is quite another thing to capture such one's self – to feel it struggling between one's fingers, and to gaze upon its fresh and living beauty, a bright gem shining out amid the silent gloom of a dark and tangled forest.[1]
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> Alfred Russel Wallace, *The Malay Archipelago*, 1869

Alfred Russel Wallace's 1869 description of capturing the *Ornithoptera poseidon*, or great bird-winged butterfly, in the Malay Archipelago exemplifies the mid-Victorian relationship to collecting natural history, whether in the field or in the cabinet. Here the visceral and exhilarating experience of searching out animals in the wild is set into high relief against the domestic familiarity, not to mention the materialistic acquisitiveness, of preparing specimens and ordering a cabinet. The capture of the live butterfly, 'struggling between one's fingers' with an immediacy reminiscent of Michelet's medusa, its 'fresh and living beauty' destined for oblivion like Gould's hummingbirds, is transcendent and fleeting. This sublime encounter set against the abyssal darkness and chaos of the tangled forest can only be replicated through the preservation and display of the 'bright gem' in the natural history museum, to shine out against the soot and smog of the gloomy city.

As Wallace's own specimen drawers held in the Natural History Museum illustrate, the insect cabinet in particular forms a powerful symbol of the Victorian collecting impulse, in the direct metaphor of pinning down nature into neatly taxonomic rows in a shallow drawer, flattening animal life into a readily measurable, highly visible order (fig. 5.1).[2] In 1873 Friedrich Nietzsche asked if

[1] Alfred Russel Wallace, *The Malay Archipelago*, vol. 2 (London: Macmillan, 1869), 199.
[2] Wallace's personal entomological collections of twenty-eight drawers containing 850 specimens only came into the Natural History Museum collections in 2002-05; however they are representative of typical Victorian insect cabinets, as they replicate exactly Wallace's original arrangement. Wallace sold many specimens to the NHM throughout the later nineteenth century.

man was 'ever able to perceive himself completely, as if laid out in a lighted display case', signalling the period's ideal of total knowledge through making visible.[3] But as well as their taxonomical epistemology, such displays bear an aesthetic significance within Victorian culture. Of the various displays in the Natural History Museum, they most closely resemble the jewellery case, especially when colourful, shiny butterflies, moths and beetles are on display. The British Museum insect collection's disproportionate emphasis on Lepidoptera (butterflies and moths), much like the Museum's sprawling displays of birds, reveals the popularity of such beautiful objects among the Victorian public and entomologists alike.[4] Keeper of zoology Albert Günther explained that 'as, for obvious reasons, Birds, Shells, Insects – especially Lepidoptera and Coleoptera [beetles] – were the groups most popular with collectors, they invariably preponderated'.[5]

Wallace's cabinet of Asian beetles not only showcases insects' exquisiteness, some appearing hand-painted, such as the blue weevil specimens, others with wondrously metallic carapaces, such as the *Buprestidae*, commonly known as jewel beetles (figs 5.2-5.4); it also reveals their bewildering strangeness. The large male stag beetle at the centre of the case possesses alarmingly large antler-like jaws, which it uses to grapple and fight with other males, the aim being to flip the other onto its back, a position it is almost impossible for the beetle to get out of.[6] A type of dung beetle, the association with faecal matter contrasts with the precious 'jewels' surrounding it. Up close, even jewel-like specimens reveal strange armoured bodies, hairy legs and antennae, bizarre proboscises and glassy

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'Wallace Collection: Collecting', *NHM Website* <http://www.nhm.ac.uk/nature-online/collections-at-the-museum/wallace-collection/collecting.jsp> accessed 1 Apr. 2013.

[3] Friedrich Nietzsche, 'On Truth and Lying in a Nonmoral Sense' (1873), quoted in Cannon Schmitt, 'Victorian Beetlemania', in Deborah Denenholz Morse and Martin Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 35.

[4] '[B]utterflies and moths have attracted special attention ever since the study of insects began.' British Museum (Natural History), *Nature Stored, Nature Studied: Collections, Conservation and Allied Research at the Natural History Museum* (London: British Museum (Natural History), 1981), 48. Several major donations and bequeathals were made to the British Museum throughout the second half of the nineteenth century, including by William Chapman Hewitson between 1879 and 1881 and L.T. Stainton in 1893. Albert Günther, *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 2: *Separate Historical Accounts of the Several Collections Included in the Department of Zoology* (London: British Museum (Natural History), 1906), 46, 570.

[5] Günther, *History of the Collections*, vol. 2, appendix, 1.

[6] Malcolm Kerley, curator, coleoptera section, Natural History Museum, personal communication (11 Apr. 2013).

or multi-lensed compound eyes (fig. 5.5).[7] On their backs, they remind us of the predicament of Gregor Samsa, Franz Kafka's unfortunate protagonist who famously awakes to find himself transformed into a beetle in *The Metamorphosis* (1915).[8] Such associations invoke a changed significance for insects from that established within the Victorian cabinet. At the same time that preserved shiny beetles and colourfully patterned butterflies were perfect objects in a static, orderly collection, when alive these same animals are vivacious, unpredictable forces – as Wallace's struggle conveys – with anatomy, movements and behaviour alien to humans. As such, philosopher Rosi Braidotti writes that for humans insects maintain 'simultaneous attraction and repulsion, disgust and desire' – the very parameters of the abject.[9]

Although the traditional display model of the insect drawer was employed in the Natural History Museum, the entomological displays following their relocation in the new Museum in 1884 demonstrated a shift of interest from traditional taxonomies showcasing beautiful specimens to more varied and dynamic displays conveying the life cycles of insects, their habitats and their relationships to humans, both benign – for example, silk-worms – and harmful – parasites, pests and wood destruction (fig. 5.6). Responding to the dynamism of the creatures themselves, these more illustrative and three-dimensional displays suggest an increasingly complex engagement with nature, echoing the transition from surface to interior that Michel Foucault theorises took place in the shift from traditional natural history towards evolutionism.[10] Insects were also mobilised in popular material culture, as shiny beetles came out of ladies' collection cabinets and started appearing on their persons in the form of necklaces, bracelets and earrings. Such 'novelty jewellery', which was popular from the 1850s on, marked a striking – albeit at the time normalised – encroachment of otherness. This ambivalence reflected the charged significance insects held in numerous works of fiction preceding Kafka, from Edgar Allen Poe's short story 'The Gold-Bug' (1843) to Richard Marsh's supernatural thriller *The Beetle* (1897), and presaged the hybrid *femmes fatales* of *fin-de-siècle* Art Nouveau. Metamorphosis, whether

[7] J.G. Wood, *Insects at Home: British Insects, Their Structure, Habits, and Transformations* (London: Longmans, Green, and Co., 1872), 10.
[8] Franz Kafka, *The Metamorphosis* (1915), trans. Stanley Corngold (New York: W.W. Norton and Co., 1996).
[9] Rosi Braidotti, *Metamorphoses: Towards a Materialist Theory of Becoming* (Cambridge: Polity Press, 2002), 149.
[10] Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (1966) (London: Routledge, 1989), 150.

in the biological sense experienced by the insects in the Natural History Museum or in the fantastical shapeshifting of creatures in art and literature, constituted a strong metaphor for radical, sometimes threatening social changes taking place within Imperial Britain by the end of the century, in particular regarding gender roles. Changes in the Insect Gallery reflected this paradigm shift and its inherent dialectics of taxonomy and evolution, beauty and abjection, science and the supernatural. Its displays convey an altered consciousness embodied by insect life itself that resonated with experimental science and society's own metamorphoses.

A New Display Paradigm

In 1886 the *General Guide* to the Natural History Museum described the variety of the exhibition in the Insect Gallery: 'Selected examples of the different groups of insects are exhibited in systematic order in the table-cases, so as to give the visitor who studies them a general idea of all the most interesting forms and of their classification.' In addition to these taxonomical displays, however, the guide described wall-cases containing 'many curious examples of nests, and of specimens illustrating the ravages of destructive insects, and also some of their economic products.'[11] The Museum's range of epistemological models for displaying insects in the later years of the nineteenth century is illustrated in an archival photograph (fig. 5.7). In an upright cabinet, butterflies, moths, beetles, and other insects are laid out in clear groupings, much like in Wallace's drawers. Pinned to squares of corkboard covered with paper,[12] they become clearly visible discrete spectacles, decontextualised from any original environment. Atop of this cabinet, however, set at an oblique angle as if mirroring the below, an overlooking case contains two world maps, with beetles pinned to the continents intermittently appearing to indicate species distribution. The display is probably the work of William Henry Flower, who upon replacing Richard Owen in 1884 as director, introduced geographical distribution and habitat to the Museum's displays.[13] As opposed to a traditional taxonomy in which specimens are isolated from the

[11] William Henry Flower, *A General Guide to the British Museum (Natural History)* (British Museum (Natural History, 1886), 33.
[12] Kerley.
[13] Susan Snell and Polly Tucker, *Life Through a Lens: Photographs from the Natural History Museum 1880-1950* (London: Natural History Museum, 2003), 7.

outside world – or the alternative naturalistic habitat display – here the preserved insects become indexical markers of worldwide beetle populations.

The various displays described in the guide and pictured in this photo harbour varying epistemologies that require historical contextualisation. While Nietzsche uses the insect case as an absurd metaphor for the impossibility of human self-knowledge, literary historian Cannon Schmitt juxtaposes this personification with a strikingly different one: Oscar Wilde's humorous take on the beetle collection as the height of tedious parlour conversation in *The Picture of Dorian Gray*.[14] While Nietzsche's 'lighted display case' becomes a symbol of total and timeless knowledge of a subject, Wilde's aging Duke of Monmouth's irrelevant chatter about the 'last Brazilian beetle that he had added to his collection' demonstrates that fewer than twenty years later – only twenty-two years after Wallace's description of capturing the *Ornithoptera poseidon* – this idea is already dated. As Schmitt writes, the Duke is an anachronism within the late Victorian context, representative of the 'intellectual backwater' of 'taking pleasure in natural history's endless tabulations', as opposed to the 'selfless rigor' of modern biology.[15]

Between its taxonomically arranged drawers and indexical and interactive displays, the small and selective exhibition of the Insect Gallery would appear to straddle these two models, as it derived from a heterogeneous collection formed over time. Primarily housed in what was known as the 'Insect Room' since its earliest incarnation in Bloomsbury, the entomology collections received steady augmentation through purchases and donations throughout the nineteenth century.[16] So many specimens entered the British Museum in the years directly before the move to South Kensington, that by the time the insects were moved to the new Museum in 1884, the collection was formidable.[17] As assistant keeper of zoology, Arthur Gardiner Butler raised the Lepidoptera collection, for example, from one of minor importance to one of the world's largest.[18] Nevertheless, complaints concerning the state of the collections and its consequently

[14] Schmitt, 'Victorian Beetlemania', 35.
[15] Schmitt, 'Victorian Beetlemania', 36.
[16] Including specimens from Wallace's foray in the Malay Archipelago in 1855 and 1877 and from Joseph Banks' collection via John Charles Bowring in 1863. William T. Stearn, *The Natural History Museum at South Kensington: A History of the British Museum (Natural History) 1753-1980* (London: Heinemann, 1981), 209.
[17] Under the entomologists Arthur Gardiner Butler, Charles Owen Waterhouse and William Forsell Kirby.
[18] Stearn, 209.

compromised scientific value were made into the final decades of the nineteenth century – Günther specifically cited the crowded and confused Lepidoptera drawers.[19] However, Günther's continuous campaigning to ameliorate the Insect Room with more staff throughout the 1880s and 90s was rewarded, and in 1895 entomology separated from the main zoology department.[20]

By the time the *Guide to the Exhibited Series of Insects* was finally published in 1908, the authors portrayed a highly dynamic variety of displays, expanding beyond the static taxonomy of the cabinet drawer. Along the sides of the Gallery were eighty-five models arranged on shelves 'to illustrate the life histories of various insects': along the west wall-cases were moth cocoons demonstrating metamorphosis and models showing the habits of gallflies; along the east were models relating to Coleoptera, Lepidoptera, Hymenoptera – including wasps, bees and ants – and Diptera – flies including mosquitoes, tsetse flies and other biting insects and vectors of disease.[21] While the traditional insect drawer was arranged for the purpose not only of taxonomy, but also of beauty, the *General Guide* explained that 'it is impossible to exhibit many of the most beautiful and rare species, owing to the deteriorating effects of continued exposure to light upon their colours'.[22] Ironically, the most spectacular specimens remained in the Museum's basement Insect Room, for scientific observation only.

Accordingly, unlike in earlier guides such as those belonging to the Mineral, Coral and Bird Galleries, the guide to the Insect Gallery included few aesthetic evaluations of specimens.[23] Instead, while emphasising the very limited examples of specimens on display compared with the 1,150,000 specimens stored in the Insect Room, the guide states, 'Where possible species likely to be of interest from agricultural or horticultural points of view have been chosen.'[24] The significance of insects to humans formed a large focus of the Gallery, reflecting

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[19] H. Goss., Honourary Secretary of the Entomological Society of London, letter to the Trustees of the British Museum (24 Nov. 1888); Albert Günther, letter, Zoological Department (9 Oct. 1888). Both in A. Günther Collection 29. Memoranda Relating to New Museum, Directorship, Staff 1868-84. *Folder 2. Official minutes and correspondence on staff matters 1867-1894*, NHM Archives.

[20] Chas O. Waterhouse, *Notes on the Various Collections of Insects in the Insect Room of the British Museum* (London: William Clowes, 1900), 22. Stearn writes that the entomology department became distinct in 1913. Stearn, 205.

[21] British Museum (Natural History), *Guide to the Exhibited Series of Insects* (London: British Museum (Natural History), 1908), 1, 3, 2.

[22] Flower, *General Guide to the British Museum (Natural History)*, rev. edn (London: British Museum (Natural History), 1901), 39.

[23] With the exception of the Reverend Lord Walsingham's 'beautiful collection of Caterpillars'. British Museum (Natural History), *Guide to the Exhibited Series of Insects*, 2.

[24] British Museum (Natural History), *Guide to the Exhibited Series of Insects*, 1.

the increasing emphasis throughout the century on 'applied entomology'.[25] It featured numerous samples of wood and other materials such as limestone damaged by insects. Some of these are prepared as naturalistic displays with the preserved beetle and larva appearing on and inside the damaged wood, akin to a habitat group or diorama on a miniature scale (fig. 5.8). Others stand alone as fascinating specimens in and of themselves, such as a *Portion of a Wooden Trunk Destroyed by White-Ants*, with its fragile latticework of remaining material resembling coral (fig. 5.9). By the turn of the century, the pronounced interest in insects' medical and veterinary importance resulted in the display of numerous models of biting flies, fleas, lice and mosquitoes – the economic implications of such insects as transmitters of disease, as well as agricultural pests, necessitated their precise identification (fig. 5.10).[26]

The industrial uses of insects were also highlighted, for instance in a display of the *Life-history of Mulberry Silk Moth* (fig. 5.11). Here the skein of the cocoon is emphasised, as, the viewer is told, it comprises 551 yards of silk. But beyond textile manufacture, along with the accompanying eggs, caterpillars set amid some half-eaten leaves and chrysalises, the cocoon equally points to another topic of fascination in the Insect Gallery: metamorphosis. The guide describes the process in which the egg hatches into larva, which undergoes a series of molts, growing larger each time, and then spins a cocoon around itself, becoming pupa in its chrysalis state before finally emerging as the *imago*, 'the perfect insect'.[27] The first use of the term 'metamorphosis' in relation to insects' life cycles was recorded in 1665.[28] Working in Surinam at the turn of the eighteenth century, Maria Sibylla Merian observed the vast dissimilarities of the various stages of the life cycle of an insect, as she illustrated in her detailed entomological drawings, thereby challenging the classical teleological view of natural history (fig. 5.12).[29] In addition to the many preserved larvae, pupae, chrysalises and cocoons shown in cases, drawings in the Gallery produced by Maud Horman Fisher from 1896-97 featured these diverse life stages (fig. 5.13). Exquisite, technically precise, and sparse compared with Merian's earlier illustrations of microcosmic natural

[25] John F.M. Clark, *Bugs and the Victorians* (New Haven: Yale University Press, 2009), 20.
[26] Stearn, 212. Economic entomology achieved independent course status in higher education in the 1880s. Clark, 190.
[27] British Museum (Natural History). *Guide to the Exhibited Series of Insects*, 6.
[28] Marina Warner, *Fantastic Metamorphoses, Other Worlds: Ways of Telling the Self* (Oxford: Oxford University Press, 2002), 79.
[29] Warner, 79.

abundance, Horman Fisher's drawings were mounted with descriptive text panels providing detailed accounts of the animals' reproductive and metamorphic processes. The information contained within spellbinds: in the example of the *Clythra quadripunctata*, a species of leaf beetle, one learns of how the beetle's larvae lives in ant nests – the adult beetle covers its eggs with its own excrement so that the eggs appear like small buds, which ants then carry into their nests. Once hatched, the beetle larvae feed on refuse and undergo metamorphosis in a case made of excrement and earthy matter, to emerge in a complete state – if the beetle can escape the attacks of the ants unscathed.

The Insect Gallery was rife with such symbiotic relationships, between different species, orders and even kingdoms, animal and plant, such as in displays demonstrating the phenomenon of mimicry in nature. In a display of the *Lithinus nigrocristatus*, amid lichen-covered tree branches hide six beetles with remarkably lichen-like markings (fig. 5.14). One beetle set aside in plain sight provides a key to the cipher, indexical like the mapped beetles. Similarly, displays of moths and butterflies show one colourful splayed out specimen hovering above an apparently leaf-covered branch, which at closer inspection harbours clandestine examples of the same species; their closed wings blend in perfectly among the leaves (fig. 5.15). Henry Walter Bates is commonly credited as providing the first scientific accounts of animal mimicry, based on his research in the Amazon.[30] 'Batesian mimicry', in which a palatable species mimics a noxious species, in an apparent ploy to fool predators, is illustrated in another of Wallace's drawers, Wallace having accompanied Bates in South America to research the phenomenon (fig. 5.16). The right-hand row of butterflies shows species that are inedible while beside them is a row of species which closely resemble these noxious species but are in fact perfectly edible. In two examples, males of the edible species which bear no resemblance to the mimicking females are also included. The case illustrates the amazing adaptability of nature for the sake of survival as well as 'an element of deceit'.[31] Other protective mimicry, including certain moths and butterflies' adaptation of colouring to resemble predators, such as snakes, reptiles and owls, was also illustrated with specimens in the Insect Gallery (fig. 5.17).

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[30] See Henry Walter Bates, *The Naturalist on the River Amazons*, 2 vols (London: John Murray, 1863).
[31] G.D. Hale Carpenter and E.B. Ford, *Mimicry* (London: Methuen, 1933), 15.

Together with Wallace, Bates claimed mimicry as support for natural selection. Darwin subsequently drew on Bates's convincing findings for his attack on design explanations of mimicry.[32] 'The greater the knowledge of the phenomena the more does it appear that Natural Selection must be invoked, and that the causes of mimicry are the same as the causes of Evolution', commentators on the subject wrote definitively in 1933.[33] However, the evolutionary process by which a species acquires resemblance to plants or other animals has remained debated.[34] The twentieth-century philosopher and sociologist Roger Caillois denied any evolutionary purpose behind animal mimicry. In his 1935 essay 'Mimicry and Legendary Psychasthenia', he posited the lack of distinction of boundaries between the animal and its surroundings as a disturbing phenomenon that resisted personalisation and labelled it a process of 'sympathetic magic'.[35] He claimed that mimicry was in fact most often inefficacious and superfluous, stemming from a primitive tendency to imitate and achieved through a natural process of three-dimensional photography.[36]

Such processes point toward the confounding nature of insect life that necessitated dynamic displays that went beyond the static taxonomies of earlier exhibition strategies. Elaborate wasp and ant nests, like the bored wood samples, constituted a three-dimensional element in the gallery that appears to presage modernist sculpture (fig. 5.18). Both demonstrate insects as architects, with a group-engineering ethos to which human efforts pale in comparison – in the second half of the nineteenth century, social insects such as ants and bees were upheld as exemplary models of social organisation.[37] The machinic geometry to which these displays allude signals an altogether new aesthetic from Victorian decorativeness and its emphasis on beautiful and discrete jewel-like specimens; it offers a glimpse into the century to come – the Age of the Insect, according to

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[32] Clark, 116.
[33] Carpenter and Ford, vii-viii. Muriel Blaisdell argues that Bates' discovery and its reliance on principles of evolutionary theory is overemphasised and that the phenomenon was widely known and theorised within a natural theological framework prior to Bates' work in the area. She claims that the difficulty Bates encountered trying to convince fellow naturalists of his ideas about mimicry was in fact due to the familiarity of topic, not its newness, and stemmed from resistance against reinterpretation. Blaisdell, 'Natural Theology and Nature's Disguises', *Journal of the History of Biology* 15.2 (1982), 164-65, 189.
[34] Including by Vladimir Nabokov. See Victoria N. Alexander, 'Nabokov, Teleology and Insect Mimicry', *Nabokov Studies* 7 (2002), 177–213.
[35] Roger Caillois, 'Mimicry and Legendary Psychasthenia' (1935), trans. John Shepley, *October* 31 (winter 1984), 16, 25.
[36] Caillois, 30, 27, 23. Although no higher powers are invoked, Caillois's explanation may be seen as the coming full circle of earlier natural theological theories behind mimicry.
[37] Clark, 54-79.

Gilles Deleuze and Félix Guattari.[38] Diagrams included in the guide to the Insect Gallery show the creatures dismembered into bodily segments (fig. 5.19). These fragmented visions contrast against the intact specimens laid out in shiny rows in the traditional case: along with their sculptural haunts and shocking life processes, they suggest an exploded understanding of insects and their incredible physiology and behaviour.

Metamorphic Otherness

As early as 1838, the entomologist J.O. Westwood claimed that the collection of beautiful insects was the lowest objective of entomology.[39] However, this did not give pause to collectors, including Charles Darwin and Alfred Russel Wallace. For these Victorian naturalists, beetles were, in Schmitt's words, 'organisms whose alluring alterity gives rise to paroxysms of desire and bouts of miserly acquisitiveness'.[40] A popular guide to entomology quipped that due to their boundless colour and form 'there is much excuse even for the mere collector, who cares nothing for insects unless he can kill them and set them in rows in a cabinet'.[41] Despite Wallace's proto-environmentalism,[42] his almost lustful description of capturing the *Ornithoptera poseidon* alongside his competitive boasts to Bates regarding his 'greatest number of species of Coleoptera collected in a day' (seventy, apparently), indicate the fetishistic value insects held for Victorian naturalists.[43] This desirous and tabular vision is literally captured in Wallace's drawers, which were typical of mid-Victorian insect displays, including in the table cases of the Insect Gallery.

However, the metamorphic, mimicking, disease-ridden and devouring examples featured in the Gallery's wall cases in the final decades of the nineteenth century suggest the less contained, more menacing resonances insects

[38] Quoted in Braidotti, 154.
[39] Quoted in Clark, 237.
[40] Schmitt, 'Victorian Beetlemania', 37.
[41] Wood, 2.
[42] Wallace, *Island Life: Or, The Phenomena and Causes of Insular Faunas and Floras, Including a Revision and Attempted Solution of the Problem of Geological Climates* (London: Harper and Brothers, 1881), 283-84.
[43] Wallace, letter to Henry Walter Bates (Singapore, 30 Apr. 1856), 'Wallace Collection: Collecting', *NHM Website*, catalogue number: WP1/3/39 <http://www.nhm.ac.uk/nature-online/collections-at-the-museum/wallace-collection/item.jsp?itemID=65> accessed 23 July 2015.

harboured. Insects, after all, held traditional associations with the devil;[44] they fell at the very bottom of the Judaeo-Christian hierarchy of being, and not much higher in the hierarchy of nineteenth-century natural history.[45] The Entomological Society of London was only founded in 1833. Even by 1856, in the first single volume 'people's edition' of their definitive *Introduction to Entomology*, William Kirby and William Spence felt it necessary to include an entire chapter defending against the lowly status of insects and their study, entitled 'Objections Answered'.[46] However, increased attention to insects towards century's end, if ambivalent, is evidenced in the new displays in the Insect Gallery.

Beyond the alien beauty insects in cabinets presented, their lived realities produced altogether more strangeness – and wonder. Kirby and Spence advised:

> [Y]ou must leave the dead to visit the living; you must behold insects when full of life and activity, engaged in their several employments, practising their various arts, pursuing their amours, and preparing habitations for their progeny: you must notice the laying and kind of their eggs; their wonderful metamorphoses; their instincts, whether they be solitary or gregarious; and the other miracles of their history.[47]

The tension between insects dead and living, as objects and subjects, collected and studied appears to echo the Victorian era's transition from traditional tabular natural history to modern biology, evidenced in the Insect Gallery's transformed displays. And yet, as Darwin and Wallace's acquisitive collecting habits demonstrate, these contrasting relationships to insects frequently coexisted – Wallace attributed his and Darwin's joint theory of natural selection to their shared interest in beetles.[48] Kirby and Spence's text was particularly notable for bridging the gap between traditional natural history and biology by combining classificatory descriptions with observations of insects' inner workings and physiology.[49] Bates rebuffed the stereotypical view of butterflies as 'creatures selected as the types of airiness and frivolity' with his study of evolutionary mimicry in said animals.[50] Historian John Clark writes: **'**Pointedly, Bates had

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[44] Bernhard Durin, Gerhard Scherer and Paul Armand Gette, *Insects, Etc.: An Anthology of Arthropods Featuring a Bounty of Beetles* (New York: Hudson Hills Press, 1981), 8.
[45] Warner, 114; William Kirby and William Spence, *Introduction to Entomology: Or Elements of the Natural History of Insects*, 7th edn (London: Longman, Brown, Green, and Longmans, 1856), 2.
[46] Kirby and Spence, 11-30.
[47] Kirby and Spence, 7.
[48] Clark, 106.
[49] Clark, 15.
[50] Clark, 117.

taken Lepidoptera, the traditional embodiment of entomological collectors, and transformed them into theoretical proof of evolution by natural selection.'[51]

Due to both their aesthetic and physiological 'miracles', in recent scholarship insects are frequently invoked as the ultimate other. Philosopher Rosi Braidotti writes:

> Insects exacerbate the human power of understanding to the point of implosion. Tiny miniatures, they exercise the same immense sense of estrangement as dinosaurs, dragons or other gigantic monsters. Improbable morphological constructs, they challenge and titillate and are hybrid par excellence.[52]

As miniature monsters, for Braidotti it is the combination of size and morphology that defines insect otherness. It was of course their diminutive stature and microcosmic exquisiteness that made insects so eminently collectable to the Victorians. Surprisingly, the Reverend J.G. Wood in his popular entomology text *Insects at Home* (1872) suggested that insects' microscopic beauty must be intended for other insects, echoing the very argument that caused so much controversy in Darwin's assessment of bird colouring.[53] The beautifully variegated turquoise and ultramarine markings of the blue weevil reveal such bewildering detailing, while the hard and shiny armoured underside of the jewel beetle, its six intricate legs and bushy antennae are examples of insects' minute monstrousness.

However, it is in fact insects' familiarity that defines and defined their otherness. Compared, for example, to faceless and formless marine invertebrates, mobile as they are in modes and environs utterly foreign to human or mammal life – and largely only discovered during the Victorian era – insects regularly have identifiable eyes, mouths and legs, and often live, to varying degrees of visibility, on dry land. They make up roughly ninety percent of the earth's species, with almost a million known species (and more than a third of these beetles)[54] – in the mid-nineteenth century this number was placed at 400,000 'or even more'.[55] Kirby and Spence wrote of the seemingly limitless 'new treasures' in specimens and species to discover: '[T]hough you may have searched every spot in your neighbourhood this year, turned over every stone, shaken every bush or tree, and

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[51] Clark, 118.
[52] Braidotti, 149.
[53] Wood, 165.
[54] 'Insecta', *Encyclopedia of Life* <http://eol.org/pages/344/overview> accessed 3 Mar. 2015.
[55] Kirby and Spence, 3 n. 1.

fished every pool, you will not have exhausted its insect productions.'[56] Insects do not inhabit an alien world; they are aliens living right under our noses. This commonality was increasingly illustrated within the Insect Gallery: displays including burrowed timber from a ship and cross-sections of a *Leg of a Music-Stool Perforated by Beetles* demonstrated the shared spaces in which humans and insects operate (fig. 5.20). Such close proximity coupled with profuseness – the 'yawning infinity of the unseen insect world'[57] – resulted in a sense of the uncanny. This was exacerbated in the final decades of the nineteenth century by the then largely accepted Darwinian concept of shared evolutionary ancestry, which further rescinded straightforward otherness. According to Clark, insects' physiological distance from humans made them safe examples to utilise in arguing controversial theories ultimately leading to the 'evolutionary continuum between man and animal'.[58]

The aspect of insects most alien to humans is arguably their life history. Metamorphosis presents a radical concept of identity, 'a new paradigm' according to Braidotti.[59] Cultural historian Marina Warner writes that the pre-modern concept of 'consistent truth-to-self' underlying metamorphoses changed with modern entomology, beginning with Merian's observations of insects' startling transformations in the late seventeenth century.[60] Literary scholar Gillian Beer claims that for notions of identity metamorphosis implies 'abrupt disconnection, the apparent fissuring of past and present'.[61] Similarly, Braidotti cites 'multiple singularities without fixed identities' but she situates these within a process of flow as much as discontinuity, referencing Deleuze and Guattari's nomadic concept of becoming.[62]

However, Braidotti refutes Deleuze and Guattari's breakdown of sexual differentiation in processes of becoming. She links the patterns of becoming woman and becoming insect to inextricable, primordial associations with femininity.[63] Thus, she establishes a 'women-insects nexus' inherent in links with

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[56] Kirby and Spence, 3.
[57] Clark, 90.
[58] Clark, 110.
[59] Braidotti, 149.
[60] Warner, 93. As late as 1856, Kirby and Spence maintained that 'metamorphosis' was not altogether accurate, since the perfect insect is already formed and only hidden in earlier life stages. Kirby and Spence, 36.
[61] Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (1983), 2nd edn (Cambridge: Cambridge University Press, 2000), 105.
[62] Braidotti, 149.
[63] Braidotti, 120.

woman as monstrous other, conflating the hairy abject insect with the *vagina dentata*, the symbolic fantasy of castrating female sexuality.[64] Elizabeth Grosz likewise reviews the connection between the insect and the symbol of the devouring female and masculine fear of castration, focussing on Caillois's writing on the praying mantis.[65] A species notorious for the female's practice of biting off her male mate's head after, during and even before coitus, the mantis is a traditional symbol of the *femme fatale*, 'the predatory and devouring female lover, who ingests and incorporates her mate, castrating or killing him in the process'.[66] However, Caillois's ultimate preoccupation, according to Grosz, is with the activity of the male mantis and his amazing ability to perform the sex act while decapitated.[67] In the literally brainless automatic sex movements, the one-time Surrealist is fascinated by the male mantis's automatist sex-robot, or 'fucking machine'.[68] While the praying mantis poses a potent symbol for the devouring, monstrous feminine, the *femme fatale* or the deathly sexual woman, like other insects it equally opens up alternative erotic models to the phallic Freudian version. Grosz argues that insect sex and other behaviour is characterised by superfluity, excess beyond the needs of the organism.[69] Braidotti cites insects' 'hyper-active sexuality, with highly accelerated rhythms and made up of many rhizome trans-species copulations with plants and flowers as well as entities of the same species (a life cycle can be completed in twenty-four hours)'.[70] The eroticism of this extreme otherness marked by incomprehensible activities both sexual and domestic (as Braidotti points out, care of infants is nullified by such rapid life cycles) lies in the elimination of boundaries and connects them to the abject.[71]

Such characterisations appear antithetical to the orderly shining jewels in Wallace's drawers; they suggest the disturbing underside of insects such displays and their collectors sought to override. New displays in the Insect Gallery of wood and stone destroyed by devouring ants and beetles along with models of mosquitoes and other flies as carriers of disease presented a more abject vision –

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[64] Braidotti, 150-52.
[65] Elizabeth Grosz, 'Animal Sex: Libido as Desire and Death', in Grosz and Elspeth Probyn, eds, *Sexy Bodies: The Strange Carnalities of Feminism* (London: Routledge, 1995), 281, 284.
[66] Grosz, 282. Caillois points out that this personification occurs in a number of cultures. Quoted in Grosz, 296 n. 8.
[67] Grosz, 283.
[68] Grosz, 284.
[69] Grosz, 280.
[70] Braidotti, 153.
[71] Braidotti, 158.

however, as we have seen, even within one of Wallace's drawers, dung beetles were placed alongside jewel beetles, juxtaposing associations of faeces and finery. Infiltrating, disease-ridden and excremental, but also beautiful and jewel-like, specimens in the Insect Gallery signified the transgression of boundaries that defines the abject. Braidotti relates insects to Julia Kristeva's interpretation of Mary Douglas's study of dirt and purity. Braidotti claims insects' machinic, almost non-animal status and their ensuing position between the scientific and the imaginary makes them 'border-line beings'.[72] This liminal status negotiates a spectrum from base to revered, their metamorphic life cycle at once monstrous and fantastical. According to Braidotti, insect life 'dwells between different states of in-between-ness, arousing the same spasmodic reactions in humans as the monstrous, the sacred, the alien'.[73]

The deterioration of boundaries between self and other that defines the Kristevan abject and the resulting otherness is further exemplified by the model of insect consciousness. 'They pose the question of radical otherness not in metaphorical but in bio-morphic terms, that is to say as a metamorphosis of the sensory and cognitive apparatus,' writes Braidotti.[74] Complex labyrinths of beetles' and ants' burrowing, the intricate architecture of ants' and wasps' elaborate sculptural nests: these exemplified an alternative model to human intelligence, one that innately superseded the individual. In examples of mimicry, whether of other insects, birds or plant life, this collective intelligence transcended not only the organism, but also species, phylum and kingdom. For Caillois, the mimicking insect, like the mantis's automaton, is one that acts and creates without a sovereign ego, thus posing 'the possibility of intelligence without thought, creativity without art, and agency in the absence of the (human) agent'.[75] Such perplexing realities, at once organic and seemingly machinic, embodied both immanence and superfluity, in species capable of both abjection and supernatural beauty, in turns invisible and spectacular. It was this duality, epitomised in the combination of jewel-like exteriors and perplexing behaviour, that gave insects their 'alluring alterity' for nineteenth-century collectors and visitors to the Natural History Museum.

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[72] Braidotti, 162.
[73] Braidotti, 149.
[74] Braidotti, 149.
[75] Joyce Cheng, 'Mask, Mimicry, Metamorphosis: Roger Caillois, Walter Benjamin and Surrealism in the 1930s', *Modernism/Modernity* 16.1 (Jan. 2009), 72.

The Enamel of Nature

One unlikely arena in which the Victorian entomological fixation surfaced was women's jewellery. Insect jewellery echoes the combination of beauty and otherness highlighted in the Insect Gallery, with the strange, metamorphic and abject qualities increasingly pronounced toward century's end. Like hummingbirds, beetles and other insects formed a popular feature of novelty jewellery in the second half of the nineteenth century. In an 1880 guide to the South Kensington Museum's animal collections, by this time held in its Bethnal Green branch, the journalist and collector Peter Lund Simmonds wrote: 'There are many insects (especially those of tropical regions) which, on account of their bright metallic reflex and variegated hues, are set in gold, as earrings, necklets, brooches, pendants, and other decorations for ladies.'[76] While novelty jewellery featuring bees, beetles and butterflies formed from metal and stones had been popular from the early century,[77] pieces from as early as the 1850s showcase real beetles in place of jewels. Species from the large family of *Buprestidae*, or jewel beetles, as well as the Brazilian diamond beetle were for obvious reasons some of the most commonly employed for this purpose, all 'refulgent with the most delicate and varied tints of gems and metals'.[78] Some examples, such as a gold necklace studded with tiny vibrant green tortoise beetles, employ enamel on the insects to enhance the vividness of their colours (figs 5.21, 5.22). Others suggest naturalistic settings, for example, a pair of earrings from c. 1850 featuring tortoise beetles set against gilt leaves, the beetles' legs themselves gilded, or a later brooch design with a large green scarab perched atop a stylised brass leaf and acorn, the insect's three-dimensional veracity contrasting against the flattened Art Nouveau flourish (figs 5.23, 5.24). While some expressed scepticism regarding women's taste for adorning themselves with insects – 'beetles are not likely to be regarded by many as lovable ear pendants', wrote one journalist[79] – contemporary descriptions of women's fashion suggest otherwise. By 1879, the American

[76] Simmonds also notes the manufacture of 'scarf-pins and sleeve links for gentlemen'. Peter Lund Simmonds, *The Commercial Products of the Animal Kingdom Employed in the Arts and Manufactures Shown in the Collection of the Bethnal Green Branch of the South Kensington Museum* (London: Eyre and Spottiswoode, 1880), 71.
[77] Shirley Bury, *Jewellery, 1789-1910: The International Era*, vol. 1 (London: Victoria and Albert Museum, 1986), 169.
[78] Simmonds, 71.
[79] *The Journal for the Society of Arts* 20 (4 Oct. 1872), 878, quoted in Charlotte Gere and Judy Rudoe, *Jewellery in the Age of Queen Victoria* (London: British Museum, 2010), 232.

Ladies' Gazette of Fashion stated that 'the mania for insect jewellery had now reached such a pitch that in a late ball many of the fair guests seemed to have emptied on their dresses the specimen case of a naturalist'.[80]

This conclusion was in fact not so outlandish, as in addition to an inexpensive alternative to gems, insect jewellery provided a forum for women to learn about natural history. Upon her first visit to Rio de Janeiro, the young Englishwoman Elizabeth Linklater wrote of seeing beetles she had only formerly encountered in jewellery.[81] Jewellery historians Charlotte Gere and Judy Rudoe write that insect jewellery conveyed no less than the 'desire to demonstrate awareness of the revolutionary developments in the study of nature'.[82] An extension of popular domestic natural history collecting aimed at women, including the beetle drawer and butterfly vivarium, like feather fashions insect jewellery was believed to connect women to a nature from which they had become detached within post-industrial society.[83] Such adornments thus contributed to the re-naturalisation of femininity, a discourse which, hand-in-hand with the domestication of femininity, emerged in response to the ills of modern urban existence.[84] As such, the jewels echoed the purpose of the Natural History Museum to reintroduce the restorative qualities of nature, in a period when 'our poor Londoners and our townspeople generally have lost all this'.[85] Like a specimen drawer, multiple species featured in some parures, for example one that pairs tortoise beetle earrings with a jewel beetle brooch, and even in single items, such as a necklace made of tortoise beetles with a pendant of a larger green beetle (figs 5.25, 5.26).

Insect jewellery became increasingly hybridised, transcending the coupling of different species to include other animals and plants, and create new forms in a sort of material mimicry that echoed the symbiotic relationships encountered in the Insect Gallery. Feather fans were decorated with hummingbirds and beetles, flowers were formed from hummingbird feathers and beetle wings and hairpins shaped like butterflies were made using beetle wings

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[80] *Ladies' Gazette of Fashion* (Aug. 1879), quoted in Gere and Rudoe, 234.
[81] Quoted in Michelle Tolini, '"Beetle Abominations" and Birds on Bonnets: Zoological Fantasy in Late-Nineteenth-Century Dress', *Nineteenth Century Art Worldwide* 1.1 (spring 2002) <http://www.19thc-artworldwide.org/index.php/spring02/206-qbeetle-abominationsq-and-birds-on-bonnets-zoological-fantasy-in-late-nineteenth-century-dress> accessed 31 Oct. 2011.
[82] Gere and Rudoe, 225.
[83] Tolini.
[84] Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995), 29.
[85] *The Times* (18 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

(fig. 5.27). Set atop long spirals, the 'trembler' settings created an illusion of the hybrid insects hovering above the head of the wearer, a bride of the 1870s.[86] Real butterflies were also used in jewellery, often surrounded by precious stones, or mounted on (silk) crêpe to be worn in the hair.[87] The South Kensington Museum showed Italian-made artificial flowers formed from died silk-moth cocoons, which took on a 'transparent velvety appearance suitable for petals'.[88] In the Brazil section of the 1873 International Exhibition in Vienna, Mademoiselles M&E Natté from Rio de Janeiro included a tiara formed of hummingbird breasts and sparkling beetles; one can appreciate the dual connotations of deception and sheer spectacle in one commentator's appraisal of the jewellers' ability to 'dazzle the eyes with the gorgeous enamel of nature'.[89] Like the metamorphic and mimicking specimens in the Insect Gallery, such jewellery was shapeshifting, illusory, difficult to 'pin down'.

Other jewellery eschewed insects' jewel-like qualities altogether, instead highlighting their more repellent and fearsome morphologies and processes. Jewellery was designed in response to the invasion of the Colorado beetle, or 'potato bug', in the mid-1870s, including one design which depicted the beetle's life cycle, eggs, larvae and all.[90] In one instalment of his *Designs After Nature* series, *Punch* cartoonist Edward Linley Sambourne parodied the false sightings and frenzy over the invasive species with a cartoon featuring a young woman (wearing beetle earrings) whose dress bears the distinctive markings of the beetle (fig. 5.28). Titled *No Mistake This Time*, the caption continues 'Arrived at last; but nothing so very terrible, after all'. Sambourne's 1867 cartoon captioned 'Next hideous "sensation chignon"', portrays the beetle-jewel-adorned woman in a more sinister light, as her hairstyle morphs into a giant spider, recalling the black widow, accomplice of the praying mantis in symbolic castration (fig. 5.29) – spiders were also featured in the Insect Gallery, which in fact covered arthropods generally. Although moulded from copper alloy, a large and realistic stag beetle

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[86] Gere and Rudoe, 232.
[87] Simmonds, 71. Actress Lillie Langtry recounted wearing a gown with netting containing preserved butterflies at the start of her career when she could not afford real jewels so lavish, probably in the 1870s or 80s. Meanwhile, butterfly wing jewellery was advertised in *Jeweller and Metalworker* in 1884. Gere and Rudoe, 234. Such jewellery has undoubtedly not preserved as well as beetle jewels due to its delicacy.
[88] South Kensington Museum, *Catalogue of the Collection of Animal Products, South Kensington Museum*, 2nd edn (London: Eyre and Spottiswoode, 1860), 62.
[89] *Art-Journal* (1873), 345-46, quoted in Gere and Rudoe, 231.
[90] Gere and Rudoe, 233. For more on the scientific and political ramifications of the Colorado beetle's threat of 'biological invasion', see Clark, 132-53.

brooch brought the more menacing insect morphology of giant and sharp mandibles to the jewellery wearer (fig 5.30). Such adornments, both real and imagined, with dangerous and repellent insects gave rise to the sentiment expressed by Mary Gay Humphreys in *The Art Amateur* in 1882: 'Wasps, hornets, caterpillars and cockroaches will all be allowed to nestle soon near the damask cheek of our fashionable beauties.'[91]

Clearly, entomological disgust was overridden by keen interest and identification among women in the last decades of the nineteenth century, as an 1875 reworking of a classic nursery rhyme in *Punch* conveyed:

> Little MISS MUFFET
> Sat on a tuffet
> Reading the news of the day;
> There came a big spider
> And sat down beside her,
> Inducing MISS MUFFET to say:
> 'Don't think to alarm me,
> Indeed, no! – you charm me,
> There's nothing to which I bring more
> Unrestricted attention,
> And keen comprehension,
> Than entomological lore'.[92]

More than just attractive adornment or objects for collection, the poem associates insects and entomological knowledge with news-reading, politically aware women. This connection is borne out in an 1870 cartoon by Sambourne featuring a well-to-do couple seen from behind, with a giant stag beetle overtaking the woman's entire upper body, its angled antennae and prominent mandibles protruding from her head: the seemingly incongruous headline of the accompanying article reads 'Suffrage for Both Sexes' (fig. 5.31). The illustration not only associates natural history knowledge with female political ambitions but simultaneously others women as less than human, lagging in terms of Darwinian evolution.[93]

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[91] Mary Gay Humphreys, *The Art Amateur* 7.6 (Nov. 1882), 130.
[92] Gere and Rudoe, 234.
[93] The accompanying article concluded that even if given the right to vote, women would end up being either physically or financially coerced into voting according to their husbands' wishes. 'Suffrage For Both Sexes', *Punch's Almanac* (2 Apr. 1870).

These connections suggest that beyond the wholesome didactic implications of nature and enlightened knowledge, in the later decades of the nineteenth century, insect jewellery and its menacing overtones harboured associations with the New Woman: the vote-seeking liberated female intellectual who threatened the foundations of gender difference. The New Woman challenged the givens of male supremacy and female subservience, while undermining women's primary roles in the social institution of marriage and the biological process of reproduction. The science writer Grant Allen claimed women's evolutionary development of qualities best suited for child-rearing and home-keeping, and drew on Darwinian natural selection to predict the extinction of the 'lady lecturers and anti-feminine old maids' who threatened these roles.[94] In the late Victorian context, feminine danger was concretised in the figure of the New Woman. Connections with the abject, potentially castrating insects displayed in the Insect Gallery and commonly worn by women are hardly surprising.

In addition to the domestic threat to the status quo presented by the New Woman, the *femme fatale* undertones of beetle jewellery are also connected to the exotic other. The traditional use of beetle wings in jewellery by Oceanic and South American cultures produced connotations of savagery (fig. 5.32).[95] But despite direct links with South America, where most beetles used in jewellery were harvested, the dominant cultural association was with Egypt. In Ancient Egyptian mythology, the *Scarabaeus sacer*, or sacred scarab, was an important symbol of renewal: every year new life springs from the balls of dung the beetle rolls, the female having laid her eggs there. Again, the insect exemplifies a symbiotic relationship, in this case a cyclical one involving waste and rebirth. The Sun god Khepri is thus pictured as a great scarab rolling the sun across the heavens to be reborn each day. In Egypt carved scarabs are traditionally worn as amulets of good luck; hence, in Victorian Britain beetle jewels were referred to as 'Cleopatra ornaments', even though apart from the beetle set as the main 'jewel' they frequently bore no particular resemblance to Egyptian jewellery.[96]

The fad for beetle jewellery and the importation of thousands of insects for that purpose coincided with the building of Egypt's Suez Canal in the late 1850s

[94] Grant Allen, 'Woman's Intuition', *The Forum* 9 (1890), 333.
[95] Humphreys, 130.
[96] Gere and Rudoe, 232-33.

and its opening in 1869. Although built by the French, then run jointly by France and Britain for a time, in 1882, following a period of political unrest in Egypt, France opted out of military intervention; the Canal and effectively Egypt came under British military rule.[97] Combined with spectacular archaeological finds of Egyptian jewellery in the 1850s, European involvement influenced a trend for Egyptian revival jewellery.[98] Initially France was the main producer of these 'archaeological jewels' due to the country's early involvement in Egypt with Jean-Francois Champollian's decipherment of hieroglyphs with the Rosetta Stone in the 1820s; however, following the opening of the Suez, they began to be produced in England.[99] Based in Conduit Street in London's West End, the jewellery firm Streeter and Co. popularised an accessible version of the archaeological style within Britain: a Streeter brooch shows the winged dung beetle Khepri clasping the sun above his head, surrounded by a faux-Egyptian decorative scheme (fig. 5.33).[100] An extravagant suite featuring dozens of large, gleaming green beetles set in gold comprises one example of 'Cleopatra ornaments' that did resemble Egyptian jewellery (fig. 5.34). Lord Granville, then foreign secretary, had the jewels made for his second wife after the Portuguese ambassador presented the South American beetles to Lady Granville following the signing of the Congo Basin treaty in 1884.[101] Yet the golden lotuses interspersed between the beetles evoke Britain's involvement in Egypt. These international associations symbolise the expanding Empire.

Insect adornment's connotations of animal and exotic feminine danger reached their apex with the dress worn by Ellen Terry in Henry Irving's 1888 production of *Macbeth* at the Lyceum Theatre in London. Immortalised in John Singer Sargent's portrait of Terry as Lady Macbeth, the emerald green medieval-style gown achieved its shimmering texture through the placement of one

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[97] Denis Judd, *Empire: The British Imperial Experience From 1765 to the Present* (1997), 2nd edn (London: I.B. Taurus, 2001), 94-97.
[98] Gere and Rudoe, 379-80.
[99] Gere and Rudoe, 380. According to Gere and Rudoe, there is clear evidence for the popularity of national or archaeological jewellery styles within countries which maintain colonial connections. Gere and Rudoe, 376.
[100] Streeter and Co. subsequently took over the former New Bond Street premises of Harry Emanuel, of the hummingbird jewellery patent, who retired in 1873. Judy Rudoe, 'Brooch by Streeter & Co.: Curator's comments', *British Museum website: Collection Online* <http://www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=81048&partId=1&searchText=Streeter++Brooch&page=1> accessed 31 Mar. 2013. Gere and Rudoe point out that such fabrications were sometimes mistaken as historically accurate, for example in Orientalist paintings of Pharaohic scenes in which women wear contemporary jewellery made in England. Gere and Rudoe, 383.
[101] Bury, 482.

thousand jewel beetle wings (fig. 5.35). Sargent's impression of the murderous Lady Macbeth lifting King Duncan's crown above her head with her shocked expression captured both Terry's intended depiction and the complementary otherworldly effect of the dress.[102] The painting recreates the brilliant effect the beetle-covered dress would have had shining in the bright white Victorian limelight. Having encountered Terry on her way to the painter's studio in full dress, Oscar Wilde attested to the transformational quality of the costume: 'The street that on a wet and dreary morning has vouchsafed the vision of Lady Macbeth in full regalia magnificently seated in a four-wheeler can never again be as other streets: it must always be full of wonderful possibilities.'[103] Designed by Alice Comyns Carr and constructed by Ada Nettleship, the dress achieved its magical quality through a netted overlay crocheted with a 'Bohemian yarn' of green silk and peacock blue tinsel, lined with green silk and trimmed with set glass jewels, metal thread embroidery, silver sequins, beading and of course the iridescent elytra (fig. 5.36).[104] Comyns Carr intended the crochet to appear somewhere in between chain mail armour and serpent scales.[105] A purple velvet cloak embroidered with golden lions and also trimmed with beetle wings was included in the costume, while at the neck of the dress sat a large brooch designed by the painter Lawrence Alma-Tadema set with a huge blood red stone, each contributing to the impression of majesty and violence (figs 5.37, 5.38).[106]

The 'glittering and barbaric splendour' of the beetle dress perfectly suited Lady Macbeth's *femme fatale* par excellence.[107] The first of three costumes Terry wore in the play – irrefutably the most memorable, and the 'talk of the town' in its time – the dress 'lends itself to the plot to murder'.[108] Beyond Lady Macbeth's role as the 'dominating influence' in the scheme to kill King Duncan, other

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[102] Terry later claimed, 'Sargent suggested by this picture all that I should have liked to convey in my acting as Lady Macbeth'. Ellen Terry, *The Story of My Life* (New York: Doubleday, 1909) <http://www.gutenberg.org/files/12326/12326.txt> accessed 12 Feb. 2015.
[103] Oscar Wilde quoted in Zenzie Tinker, 'Condition assessment and estimate for re-conservation: Lady Macbeth costume worn by Ellen Terry c. 1888', textile conservation, National Trust (July/Aug. 2007), 4.
[104] The latter were added as an afterthought of Terry's inspired by a dress worn to a dinner party by Lady Randolph Churchill. Tinker, 5.
[105] 'The Actor and the Maker: Ellen Terry and Alice Comyns-Carr', *V&A website* <http://www.vam.ac.uk/content/articles/t/the-actor-and-the-maker-ellen-terry-and-alice-comyns-carr/> accessed 13 Feb. 2015.
[106] Susannah Mayor, house steward, Smallhythe Place, personal communication (6 Feb. 2015).
[107] Tinker, 3.
[108] 'How I Sketched Mrs Siddons's Shoes', *Pall Mall Gazette* (11 Jan. 1889), clipped in Ellen Terry's *Macbeth* notebook, Smallhythe Place Archives; Emma Slocombe, 'Lady Macbeth at the Lyceum', *Apollo*, NT Historic Houses and Collections Annual (2011), 4-11.

aspects of her character mark her notoriety, and are reflected by the costume.[109] The animalism of the dress apparently crawling with insects reflected the 'inhuman cruelty' traditionally inferred of Lady Macbeth.[110] Theatre critic Joseph Comyns Carr, husband of Alice, described her typical representation as 'a sexless creature endowed with the temper of a man and the heart of a fiend', and the 'evil genius' behind her weaker husband, echoing contemporary characterisations of the New Woman.[111] Beyond her presumed masculine ambition and ruthlessness, Lady Macbeth is seen as lacking feminine compassion and maternal instinct; she even hints at infanticide with her line about 'dash[ing] the brains out' of a suckling baby.[112] In the late-nineteenth-century context, Lady Macbeth thus conforms to the evolutionary abomination condemned by social Darwinists such as Grant Allen. Primitive like insects that neither heed their mate nor care for their young, her beastliness is matched by Terry's insectile, serpentine costume. Its metamorphic melding furthermore emphasises connections to witchcraft – as in the spell of *Macbeth's* second prophetic witch that harnesses the shapeshifting magic of amphibians with eye of newt and toe of frog.[113]

Further contributing to the infringements on normative Victorian femininity was the dress's exoticism. Terry, who was closely involved in the design, selected for its source an engraving of an eleventh-century statue of Saint Clotilde, Queen of Franks, from Notre-Dame de Corbeil (fig. 5.39).[114] While all of the costumes in Irving's production were intended to be historically accurate, the beetle dress stood out.[115] Impressed no doubt by the jewel tones and heavy metal trim, Wilde quipped that while Lady Macbeth apparently sourced her husband and servants' wardrobes locally, she appeared to 'do all her own shopping in Byzantium'.[116] Terry herself lauded the Pre-Raphaelite aesthetic of the gown: 'The whole thing is Rossetti – rich stained-glass effects'.[117] Its militant and

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[109] Joseph Comyns Carr, *Macbeth and Lady Macbeth: An Essay* (London: Bickers and Son, 1889), 5.
[110] Comyns Carr, 6.
[111] Comyns Carr, 6.
[112] Stephanie Chamberlain, 'Fantasizing Infanticide: Lady Macbeth and the Murdering Mother in Early Modern England', *College Literature* 32.2 (2005), 72–91.
[113] Warner, 23.
[114] Most likely by the Gothic revival archirect Eugène Viollet-le-Duc. Emma Slocombe, curator, National Trust, 'Dress in the Limelight', powerpoint presentation (2011), 18.
[115] Henry Irving, 'Preface', in *Macbeth: A Tragedy by William Shakespeare, as Arranged for the Stage by Henry Irving* (London: Nassau, 1889), 7.
[116] John Stokes, 'Shopping in Byzantium: Oscar Wilde as Shakespeare Critic', in Gail Marshall and Adrian Poole, eds, *Victorian Shakespeare, Volume I: Theatre, Drama and Performance* (Basingstoke: Palgrave MacMillan, 2004), 178-91.
[117] Terry, *Story of My Life*.

medieval resonance made it, as dress historian Valerie Cumming has claimed, the 'incarnation of exotic and barbarous splendour'.[118]

But while the resulting impression might have been dramatic and forbidding, Terry had altogether different ideas about her portrayal of Lady Macbeth. Opening on the 29 December 1888 for a six-month run with 150 performances, *Macbeth* was highly controversial, primarily due to Terry's softened version of Lady Macbeth.[119] Throughout her copy of Irving's adaptation of the play, Terry made notes on Lady Macbeth's ultimate femininity, commenting, 'She is *very feminine*' and 'truly and typically a woman'.[120] Joseph Comyns Carr, who owned the New Gallery where Sargent's equally controversial portrait was hung during the course of the play, supported Irving and Terry's interpretation of Lady Macbeth, claiming that her usual monstrous and masculine portrayal was a 'grotesque caricature' and that Shakespeare's heroine in fact exhibited the 'finer moral feelings of a woman', even if only in retrospect.[121] While the choice to nevertheless attire Lady Macbeth in the animalistic, exotic and primitive trappings of the *femme fatale* appears at odds with her sympathetic rendering, this may be viewed as an attempt to demystify the trope of the *femme fatale* and its root in the New Woman. Just as the demonization of New Women as anti-feminine comprised a grotesque caricature borne out of women's political reaction to desperate constrictions, Terry's humanised Lady Macbeth was simply a woman acting out of desperation.

The Literary Metamorph

Marina Warner writes that tales of metamorphosis have often arisen in 'spaces (temporal, geographical, and mental) that were crossroads, cross-cultural zones, points of interchange'.[122] Although originally written three centuries prior, *Macbeth* as interpreted in Irving and Terry's infamous production centring on the serpentine beetle dress, becomes one such tale. With the myriad challenges, international and domestic, faced by the British Empire, including competition

[118] Tinker, 3.
[119] Mayor.
[120] Terry's personal copy of *Macbeth: A Tragedy by William Shakespeare, as Arranged for the Stage by Henry Irving*, Smallhythe Place Archives. Emphasis in original.
[121] Comyns Carr, 7, 24.
[122] Warner, 17.

from other growing empires, the mobilisation of the suffragette movement and fears of degeneracy in the form of homosexuality, prostitution and sexual disease, the final years of the nineteenth century qualify as a period at a cultural crossroads.[123] In contemporary literature, the trope of metamorphosis and its implications for identity and nation frequently centred on the body, for example in the shapeshifting titular character of Bram Stoker's *Dracula*, who is encountered as a bat, a wolf and most famously an ageless ghoul with an insatiable appetite for blood. However, also first published in 1897 and initially outselling Stoker, having undergone fifteen printings by 1913,[124] Richard Marsh's *The Beetle* is more directly relevant to displays in the Insect Gallery as it features an equally despicable and cunning eponymous villain, albeit one who has the ability to transform itself into an insect. 'It' is the appropriate pronoun here, as the Beetle's gender remains ambiguous throughout the text: just as it straddles species, it crosses the sexes. As well as a dangerous infiltration of humanity, femininity and masculinity, the Beetle presents a marked threat to British nationhood, as the creature originates from an Egyptian tomb, appearing in London to carry out a sinister plot.

The epistolary novel begins with the first-hand account of the destitute out-of-work clerk Robert Holt, who seeks shelter in a seemingly uninhabited house, only to find himself mounted in the dark by a multi-legged creature with hypnotic glowing eyes, an unbearable stench and a distinct air of evil. When the light is switched on, the creature is replaced with a person of indeterminate sex but unmistakably foreign, 'supernaturally ugly' to the point of deformity, and who has gained mesmeric power over Holt's words and actions, in order to command the poor clerk to break into the house of politician Paul Lessingham.[125] The rest of the novel is spent unravelling the reasons for the sinister personage's hatred for Lessingham, who is rising both in the House of Commons and in the heart of Marjorie Lindon, the daughter of Lessingham's conservative rival, though she herself is of decidedly progressive views. The Beetle eventually kidnaps Miss Lindon, with the help of the hypnotised Holt, in an attempt to inflict revenge on Lessingham and to ultimately rape, torture and sacrifice the young virgin. Finally Lessingham reveals his terrible secret of having been held captive in his youth by

[123] Judd, 130-53.
[124] Julian Wolfreys, 'Introduction', in Richard Marsh, *The Beetle* (1897), ed. Wolfreys (Peterborough, ON: Broadview, 2004), 11.
[125] Marsh, 53.

the Children of Isis cult in a stone tomb in Cairo. Lured and enslaved by a siren-like woman with a beautiful singing voice, he remained trapped through hypnosis and exposed to 'orgies of nameless horrors' including the routine sacrifice of white female virgins, before eventually escaping his 'mesmeric stupor' and strangling the woman until she slipped from his grasp to appear as a 'monstrous beetle, – a huge, writhing creation of some wild nightmare'.[126]

The Beetle is an almost parodic exemplar of *fin-de-siècle* Gothic literature's manifestation of anxieties over the imperial other.[127] In gender, race and species, the invasive villain embodies a monstrous other to normative British identity. From its 'beak-like nose' and 'thick and shapeless' lips suggesting 'more than a streak of negro blood', to the strange hooded robes of its burnoose and 'queer foreign twang' of its raspy voice, its humanoid incarnation, referred to throughout as 'the Arab' or 'diabolical Asiatic', is portrayed as alternately ridiculous and evil.[128] The strongest racial character of the Beetle is in fact its implacability: several narrators speculate as to its race, just as to its sex, coming up inconclusive. What is ascertained throughout is the figure's ugliness, darkness, dirtiness, smelliness, strangeness of movement and nefarious character, or 'presence of evil'.[129] Its evasive racial typeability is echoed in the confusion of gender, and as a result, sexuality. The figure is portrayed variously as a feminised foreigner or a fallen woman, one whose hideous visage reflects a lifetime of degraded acts, a feminine Dorian Gray. In both guises, his or her sexual trespasses through invasive probing and kissing, sexual enslavement and rape (invoked euphemistically as 'that to which death would have been preferred!')[130] suggest same sex infringements. W.C. Harris and Dawn Vernooy identify *The Beetle* as a queer text, one whose coded, unspeakable sins have more to do with homosexuality than rape, its 'nameless horrors' equivalent to Oscar Wilde's 'love that dare not speak its name'.[131]

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[126] Marsh, 243, 245.
[127] Patrick Brantlinger has identified a subgenre to which *The Beetle* belongs, along with *Dracula* and H.R. Haggard's *She*, as the 'Imperial Gothic'. Cited in Cannon Schmitt, *Alien Nation: Nineteenth-Century Gothic Fictions and English Nationality* (Philadelphia: University of Pennsylvania Press, 1997), 19.
[128] Marsh, 140, 103, 85, 293.
[129] Marsh, 167.
[130] Marsh, 293.
[131] W.C. Harris and Dawn Vernooy, '"Orgies of Nameless Horrors": Gender, Orientalism, and the Queering of Violence in Richard Marsh's The Beetle', *Papers on Language and Literature* 43.3 (autumn 2012), 352, 363.

Thus, *The Beetle* is read variously as manifesting anxieties of the late Victorian era and subverting the notions of stable identity on which those are based. The text is notoriously destabilising, 'hysterical', ruinous.[132] With its multiple narrators and overlapping narratives, it is pastiche, 'excessive beyond hybridity'.[133] From the disorientating city streets of London at night to shadow play on the wall of an Egyptian tomb, phantasmagoria is invoked throughout. The novel's primary locations, both its familiar but alienating sites within London, some not far from South Kensington, and the exotic Egypt of memory, are echoed in the site of the Natural History Museum and the foreign locales evoked by its specimens. Pseudoscientific mesmerism, the Beetle's primary weapon, suggests the permeability of the subject, susceptible to bend to another's will, and echoes the penetration of London, British society and the Empire. Like the desecrated wood and stone specimens in the Insect Gallery, once solid and discrete, they now appear porous as a sponge.

The insect was an appropriate figure for *The Beetle*'s theme of an infringing otherness to the British Empire. The titular Beetle is an invasive species, whose infiltration of London echoes real or perceived threats of infestation, such as of the Colorado beetle or the boring, biting and disease-spreading insects on display in the Natural History Museum. There is a direct parallel with fears of non-white corruption of British society at the *fin de siècle*. Elaine Showalter writes: 'After General Gordon's defeat by an Islamic fundamentalist, the Mahdi, at Khartoum in 1885, many saw signs that the Empire was being undermined by racial degeneration and the rebellion of the "lower" races.'[134] Harris and Vernooy conflate the novel's queerness with its Orientalism, with Egypt traditionally associated with homosexuality, and according to Edward Said, bestiality.[135] It is fitting that a member of the 'lower' biological class Insecta should represent such a threat. Anxiety was especially directed at racial mingling or crossbreeding: the traversal of boundaries was taboo at a time when racial

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[132] Kelly Hurley, *The Gothic Body: Sexuality, Materialism, and Degeneration at the Fin de Siècle* (Cambridge: Cambridge University Press, 1996), 125; Wolfreys, 'The Hieroglyphic Other: *The Beetle*, London, and the Abyssal Subject', in Lawrence Phillips, ed., *A Mighty Mass of Brick and Smoke: Victorian and Edwardian Representations of London* (Amsterdam: Rodopi, 2007), 190.
[133] Wolfreys, 'Hieroglyphic Other', 170. Elaine Showalter also notes that the format of the late Victorian Gothic novel – one slim (often exquisitely bound) volume – that replaced the standard three volumes, did away with the traditional beginning-middle-end or mother-father-child format. Consequently, it spoke to 'the celibate, the bachelor, the "odd woman", the dandy, and the aesthete'. Showalter, *Sexual Anarchy: Gender and Culture at the* Fin de Siècle (London: Bloomsbury, 1991), 16.
[134] Showalter, 5.
[135] Edward Said, *Orientalism* (1978), cited in Harris and Vernooy, 353.

differentiation and hierarchy – like sexual difference – was deemed of paramount scientific importance; in *The Beetle* these transgressions are also inter-species – such trespassing connotes that the insect menace is equally of a sexual nature.

As well as an encroaching otherness, the Beetle equally embodies fears of degeneracy and corruption within London, ranging from the threat of sexual disease – linked both to foreign sources and to prostitution, now rife within the capital – to the unknown effects of rapid urban sprawl.[136] Such urban anxieties are the same ones that the Natural History Museum purported to counter against with its healing dose of nature. In the Egyptian villain's infiltration of the capital, Julian Wolfreys sees the 'imaginative reversal of colonial relations between master and servant', inferring a Lacanian other as the mirror of the self.[137] This fantastical otherness is paralleled by the insect as a familiar alien, anthropomorphic but utterly strange, and its function as a distant mirror within evolutionary theory. The supernatural creature's metamorphic form is only conceivable in the wake of Darwinism and its evocation of unthinkable transformations and morphic structures; meanwhile, other scientific disciplines that sought to elucidate the human subject, such as physiognomy, psychology and sexology, ended up 'fracturing it beyond recognition'.[138]

However, Kelly Hurley posits that the 'abhuman' metamorphic body found in *The Beetle* and its breakdown of the subject can be viewed as not simply a target for cultural anxiety and disgust, but moreover a constructive vehicle for harnessing insecurity into negotiating transformation.[139] Although primarily reviled – Hurley connects the 'nauseating amorphousness' of the creature's multiple sticky legs, foul smell and damp and dingy haunts to the Kristevan abject – the villain is at times portrayed as highly alluring: in the siren song of its incarnation as a young Egyptian woman and when transformed from beetle into human form the naked woman's body, contrasting against its former golden green scales, is, we are told, 'by no means old, or ill-shaped either'.[140] Hence, while the Beetle's inbetweenness is inarguably repulsive, the same slipperiness that makes it so is simultaneously attractive in its breakdown of familiar meaning.

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[136] Wolfreys, 'Hieroglyphic Other', 169, 172, 184.
[137] Wolfreys, 'Hieroglyphic Other', 173, 179.
[138] Hurley, 7, 9.
[139] Hurley, 5.
[140] Hurley, 130-32; Marsh, 150-52.

Correspondingly, Wolfreys draws on Jacques Derrida's concept of the 'hieroglyphic text', which signifies its own gesture prior to any mimetic function and hence becomes 'a trace irreducible to any particular meaning and yet one which causes a proliferation of interpretation'.[141] Wolfreys proposes that instead of a supernatural figment of fiction to be taken at face value, the undecidable creature marks a sort of hieroglyph. He suggests that

> we treat the Beetle less as a character in the sense of an anthropomorphized embodiment of attitudes, rhetorical figures, and descriptive language, beliefs, and other systems of thought, gathered together and animated by work of the proper name, than as a character, in the senses of a mark, inscription or engraving, a graphic symbol, a form or system of writing, or a cipher the purpose of which is to encrypt and therefore make secret communication.[142]

The insect as hieroglyph resonates with the indexical beetles that mark the maps of the Natural History Museum's display. As pre-empting representation, Wolfreys' 'hieroglyphic other' corresponds to Braidotti's insistence on the insect as biomorphic other, requiring a reading of metamorphosis that goes beyond metaphor.

The character's feminised push and pull of fascination and horror echoes the displays in the Insect Gallery: the alluring beauty of the jewel beetles in their drawers and other displays of damaging/castrating insects. While *The Beetle* expresses a pantomimic level of anxiety over the collapse of the discrete human subject (and threats to its perfect white, male upper-middleclass incarnation), at the same time there is a sense of *jouissance* at letting go of the rigid hold on its defining boundaries and a longing for – if not outright embrace of – the other. Like the 'barbarous splendour' of Lady Macbeth's beetle dress culminating out of the trend for safer beetle jewels, the gradual displacement of the Nietzschean pinned down specimen-subject with dynamically disturbing metamorphic, devouring and disease-carrying counterparts provided useful tools for engaging with these realities and all that they signified for national and individual identity in the *fin de siècle*.

Braidotti theorises a 'trans-species nomadism', in which hybrid human-animal creatures mark 'ethnic mixity, moral ambiguity, sexual indeterminacy and unbridled erotic passion'.[143] It is the insect in (wo)man that spurs the transgression and erasure of bodily boundaries to ultimately explode the confines of the self.

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[141] Wolfreys, 'Introduction', 33.
[142] Wolfreys, 'Introduction', 34.
[143] Braidotti, 128.

The civilised/abject, self/other dichotomy that is embodied in the human/animal (insect) relationship suggests an encroachment that is literalised in the process of metamorphosis, which in *The Beetle* is explicitly tied to gender. Each point that the villain transforms from human to insect form and back – the 'Apotheosis of the Beetle' – her female sex is revealed. In one instance a direct link is made to Egyptian legends surrounding the goddess Isis and 'the beetle which issues from the woman's womb through all eternity'.[144] The monstrous human-sized beetle is thus explicitly gendered female; standing upright with its legs out front, like the Natural History Museum's jewel beetle's underside, it is, in effect, a giant *vagina dentata*, a castrating feminine lack.

The feminisation of the Beetle belongs to the 'women-insects nexus' hypothesised by Braidotti and Grosz, from the intrinsically feminine nature of becoming-insect to the castrating female mantis. Much like the non-white other, the New Woman was perceived as degenerate, poisoning the foundations of imperial, gendered identity. *The Beetle* dramatises this perceived threat from within and without, both containable and uncontainable, in the contrast between Marjorie Lindon's insipid New Woman character – who is ultimately punished with rape and corrected by marriage – and the Beetle's more sinister and chaotic foreign feminine menace. The real threat is made explicit in the graphic torture and burning alive of young Englishwomen 'stripped to the skin, as white as you or I' by the sexually sadistic Egyptian Woman of the Songs, 'as usual after such an orgy, rather a devil than a human being, drunk with an insensate frenzy, delirious with inhuman longings'.[145] The key aim of pursuit comes to be the protection of white English womanhood: Schmitt writes that threatened femininity is crucial to the discourse of threatened nationhood.[146] When Lessingham considers the 'spoiled husk' he might find of Marjorie, his horror at the prospect of her stolen virginity echoes fears over the ruin of the Empire.[147]

The dialectic of threatening and threatened femininity in *The Beetle* is typical of responses to transforming femininity, which results in a surplus of literary female corpses and *femme fatales* at the *fin de siècle*. The novelist Ouida, who was credited for coining the term 'New Woman' (disparagingly) in 1894,[148]

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[144] Marsh, 150.
[145] Marsh, 244.
[146] Schmitt, *Alien Nation*, 11.
[147] Marsh, 295.
[148] The term had in fact it had been used in the 1860s. Natalie Schroeder, 'Introduction', in Ouida, *Moths* (1880), ed. Schroeder (Peterborough, ON: Broadview, 2005), 24.

posed an analogous dualism in another, albeit less fantastical, insect metaphor in her society novel *Moths* (1880). Speaking to Vere, the innocent young woman who is to be pitched into a decadent and vacuous society by her uncaring benefactors, an older male mentor warns her:

> This world you will be launched in does no woman good. It is a world of moths. Half the moths are burning themselves in feverish frailty, the other half are corroding and consuming all that they touch. Do not become of either kind. You are made for something better than a moth … The women of your time are not, perhaps, the worst the world has seen, but they are certainly the most contemptible. They have dethroned grace; they have driven out honour; they have succeeded in making men ashamed of the sex of their mothers; and they have set up nothing in the stead of all they have destroyed except a feverish frenzy for amusement and an idiotic imitation of vice.[149]

In this explicitly upper-middleclass context, Ouida expresses her disdain for the New Woman, even though the novel is also deeply ambivalent about marriage. Moths with their delicate, flittering wings are posed as frivolous and vulnerable, yet with the capacity for mass infestation and destruction.

The hysterical gender metaphors insects assume are symptomatic of the mass frenzy surrounding gendered identities that took place in the 1880s and 1890s, a period in which the terms feminism and homosexuality both entered common usage.[150] The New Woman was but one manifestation of widespread 'sexual anarchy'; she found her male equivalent in the Decadent.[151] Sexual anarchy was countered by an ever-growing regime of sexual science. The medicalisation of homosexuality – and grouping together with social and sexual maladies such as addiction and celibacy – throughout the 1880s reached widespread public attention with Oscar Wilde's trials in 1895.[152] Female ambitions outside the home were warned against by the medical and scientific establishments as leading to sickness, neurosis, sterility and racial degeneration.[153] In both cases, fear mounted over the amalgamation of the sexes, and hence the transgression of boundaries. Showalter writes that 'the New Woman and the decadent seemed to violate proper hierarchies and social organisms'.[154]

These instabilities correspond to the breaching of biological hierarchies and organisms. In late gothic fiction, as we have seen, the shapeshifting of species

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[149] Ouida, *Moths*, 3 vols. (London: Chatto & Windus, 1880), 117-18.
[150] Showalter, 3.
[151] Showalter, 3, 169.
[152] Showalter, 170-71, 3.
[153] Showalter, 39.
[154] Showalter, 169.

is coupled with gender metamorphosis, a fantastical correspondence to Havelock Ellis's developing ideas that sexual desire is changeable and exists on a spectrum.[155] However, equally present is the theme of mimicry, pretending to be something one is not. Walter Benjamin ascribes the human faculty for mimesis to evolution out of animal mimicry.[156] This shared human-animal deception of the senses is invoked by the Beetle's calling card: an apparent photogravure with such a 'semblance of reality' that it 'seemed alive', instilling terror in Lessingham.[157] Its inexplicable realism resonates with the 3D photography Caillois locates in insects' adaptation of mimicry and its origin in primitive imitation. Both examples resonate with the increased three-dimensionality of new displays in the Insect Gallery, including examples of mimicry with their camouflaging leaves and twigs. And yet the latter equally invokes the two-dimensional image – as emphasised in Wallace's drawer of mimic specimens with wings outspread – with images appearing painted on beetles, butterflies and moths. This tension between surface and depth comes to typify the deceptiveness of insect mimicry and its sinister connotations, in spite of its protective faculty.

The virtues of depth and stability are constantly at risk in *The Beetle* and are ultimately evaded by its slippery titular character. Like gender and race, even the death of the 'liminal man-woman-goddess-beetle-Thing' is inconclusive.[158] Following a rail accident in the novel's climax, the only remains found are some nonhuman bloodstains. Wolfreys writes:

> Unlike Stoker's *Dracula*, where the Count is firmly dispatched with a stake through the heart – it's almost as if, like a butterfly, he were pinned down, disposed of and *defined for all time* – Marsh's avenging creature leaves no signs that it has been conclusively, finally destroyed.[159]

This comparison corresponds to the seeming infallibility yet obsolescence of traditional Victorian display methods, much like Nietzsche's impossible-to-pin-down human subject. While *Dracula's* dead and defined villain puts the nail in the coffin of the foreign, feminine unknown, *The Beetle*, like the newer dynamic displays in the Insect Gallery, marks a new and uncertain way of knowing, a

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[155] Ellis's *Sexual Inversion*, co-authored with J.A. Symonds, was published in English in 1897.
[156] Walter Benjamin, 'On the Mimetic Faculty' (1933), in *Reflections: Essays, Aphorisms, Political Writings*, ed. Peter Demetz, trans. Edmund F.N. Jephcott (New York: Schocken, 1989), 333-36.
[157] Marsh, 115.
[158] Lockhurst, quoted in Wolfreys, 'Introduction', 15.
[159] Wolfreys, 'Introduction', 33. Emphasis mine. Harris and Vernooy disagree that the Beetle's demise is inconclusive and argue that rather than an evasion of normative imperial values, the character's destruction in the rail accident represents its subsumption to such values. Harris and Vernooy, 344.

shapeless one that acknowledges its own limitations, the possibilities of the unknowable.

The Supernatural and the Insect Gallery

The Beetle like the Insect Gallery advances on a new paradigm of science. The course it takes to get there, however, traverses the boundaries of pseudoscience, with the practice of mesmerism. Developed by the eighteenth-century physician Franz Anton Mesmer (pejoratively termed 'mesmerism' by sceptics), animal magnetism was initially intended for medical purposes.[160] By the mid-nineteenth century it was a popular treatment and entertaining spectacle in British society, according to historian Alison Winter, one which delivered a self-reflexive investigation into issues of identity and belief:

> The question of whether the effects were natural or supernatural made experiments a testing ground of faith and doctrine. In making their way through a mesmeric trial, people found themselves exploring the major problems of the age. Writ large, Victorians were not merely testing the reality of a particular phenomenon or the veracity of a particular person; they were carrying out experiments on their own society.[161]

Specifically, the act of making another bend to one's will invoked issues of class, race and gender that could not otherwise be voiced.[162] The penetration of the limits of the self likewise carries sexual implications.[163] As such, mesmerists were traditionally men, their patients usually women – female subjects were expected to be more porous, susceptible to the powers of suggestion, as well as less governed by reason.[164]

The permeation and resulting transformation of the subject that transpire under mesmerism can be understood as a metamorphic process. One exits a trance altered, indicating a parallel capacity for the ruptures of identity experienced by animals undergoing transmutations. It is important to consider the bestial implications of 'animal magnetism', which were noted since early in its practice,

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[160] Alison Winter, *Mesmerized: Powers of Mind in Victorian Britain* (Chicago: University of Chicago Press, 1998), 2.
[161] Winter, 4.
[162] Winter, 7.
[163] Wolfreys, 'Introduction', 13.
[164] *The Beetle* flips this gender dynamic, with the feminine villain's mesmeric penetration of and control over her male victims creating a disturbing inversion resulting in 'abjected masculinity'. Hurley, 142.

with practitioners said to have 'animal-eyes'.[165] The permeation of the mind threatened the subject's autonomy, that which differentiated the human from 'lower' animals, and which was realised at its most complete form in the white male European subject. This penetration, ultimately of civilisation, as sensationalised in *The Beetle's* themes of the incursion into and violation of imperial London and its citizens, connects to the invasive quality of insects that became a focus of the Insect Gallery by the end of the century. The elaborately perforated wood samples – in particular the bored music stool leg – illustrate this infiltration of a non-civilised but pervasive uncanny otherness.

Insects carried longstanding associations with the supernatural. In contrast with Ouida's metaphor for vacuous women at the *fin de siècle*, moths and butterflies were a traditional symbol of the soul.[166] Both the transformation of natural bodies and the mutability of the soul were primary themes in Ovid's mythico-historical epic poem *Metamorphoses*.[167] Warner writes of this ancient concept of the newly winged creature emerging from its cocoon: 'The butterfly offered an image of the etherealized self, it communicated the idea that the fleshly, inferior integument would be shucked off to release the essence, soul: self shuffling off this mortal coil.'[168] In the mid-nineteenth century, Kirby and Spence described insects as 'symbolic of beings out of and above nature', associating butterflies with angels and horned, spiked and fanged species with 'evil demons' and 'impure spirits'.[169] The benevolent and nefarious meanings located in such imaginings resonate with Wallace's transcendental description of the brilliant *Ornithoptera poseidon* set against the gloomy forest, but also with the mimic specimens showing their 'true colours' in his drawer and deceptively hidden amid leaves in the mimicry displays.

As several authors have noted, the Victorian era's surge of interest in the supernatural was not necessarily regarded as incompatible with official scientific knowledge, but in fact constituted mutually informing phenomena.[170] Winter

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[165] Winter, 1.
[166] In Ancient Greek *psyche* means both soul and butterfly or moth. Warner, 90.
[167] Warner, 1-3.
[168] Warner, 84.
[169] Kirby and Spence, 6.
[170] Richard Noakes, 'Spiritualism, Science and the Supernatural in Mid-Victorian Britain', in Nicola Bown, Carolyn Burdett and Pamela Thurschwell, eds, *The Victorian Supernatural* (Cambridge: Cambridge University Press, 2004), 23-24. Also see Anna Neill, *Primitive Minds: Evolution and Spiritual Experience in the Victorian Novel* (Columbus: Ohio State University Press, 2013).

argues that the categorisation of mesmerism as pseudoscience is anachronistic.[171] Strong links were forged between evolutionary theory and 'the stuff of dream' in scientific writing and fiction alike.[172] Even Thomas Henry Huxley, ardent promoter of Darwin's theories and notorious sceptic, wrote that 'Ovid foreshadowed the discoveries of the geologist', equating Atlantis with the new world, and centaurs and satyrs with 'creatures approaching man more nearly than they in essential structure'.[173] While Huxley stopped at the metaphor, A.R. Wallace became an ardent subscriber to Spiritualism and mesmerism. Irreligious, Wallace undertook a systematic examination of Spiritualist phenomena, attending a great number of séances and mesmeric demonstrations from as early as 1844.[174] Thus, while it is widely believed that 'Wallace was led to spiritualistic belief as a function of his inability to view human evolution in entirely materialistic terms – in particular, as a function of the limitations of natural selection', it seems likely that such belief had permeated his evolutionary thought from before he and Darwin publicised their theory of natural selection; Spiritualism and related supernatural beliefs informed his evolutionary thought.[175] His belief in an afterlife and its determination by moral and intellectual development in life was reflected in the natural cause and effect relationship of evolution.[176]

It is notable that while Darwin was sceptical, other evolutionary thinkers and scientists were supportive of spiritualism, including Robert Chambers, William Benjamin Carpenter, Lord Rayleigh and William Crookes among others.[177] Eventually, Wallace diverged from Darwin when his spiritualism and utopian social values led him to reject the 'all-sufficiency' of natural selection.[178] However, all along, as his biographer Michael Shermer writes, 'Wallace was in

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[171] Winter, 4.
[172] Neill, 2.
[173] Thomas Henry Huxley, *Evidence as to Man's Place in Nature* (New York: D. Appleton & Co., 1873), 9, quoted in Neill, 1.
[174] Michael Shermer, *In Darwin's Shadow: The Life and Science of Alfred Russel Wallace* (New York: Oxford University Press, 2002), 181-82; Charles H. Smith, 'Alfred Russel Wallace on Spiritualism, Man and Evolution: An Analytical Essay', self-published pamphlet (Torrington, CT, 1992), 7. Wallace's accounts of his early experimentation with mesmerism are documented in Wallace, 'Notes on the Growth of Opinion as to Obscure Psychical Phenomena During the Last Fifty Years', *The Alfred Russel Wallace Page hosted by Western Kentucky University* <http://people.wku.edu/charles.smith/wallace/S478.htm> accessed 13 Feb. 2015. His views on spiritualism are contained in Wallace, 'The Scientific Aspect of the Supernatural', *The English Leader* (Aug. and Sept. 1866), *passim*.
[175] Smith, 4, 3-19.
[176] Smith, 8.
[177] Shermer, 183, 190.
[178] Smith, 3. Wallace also diverged from Darwin on the latter's theory of sexual selection. See Helena Cronin, *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991), 113-64.

search of a *natural* explanation for the supernatural'.[179] As such, his position flips the search for higher powers in nature on which natural theology established itself and the location of the fantastic in natural processes encapsulated in both Caillois's theory of sympathetic magic and the *fin-de-siècle* literary metamorph. Warner writes that 'magic may be natural, not supernatural'.[180]

Mesmerism's prominence of place faded with the increasing categorisation and professionalisation of science combined with the perceived importance to remove human agency: in the late Victorian era mesmerism and related phenomena were absorbed into psychic research, physiology and psychoanalysis.[181] *The Beetle's* supernatural interpretation reflects mesmerism's simultaneous increasing obscurity and notoriety by the *fin de siècle*, following the 'furious debates' that ensued after an 1882 report by neurologist Jean-Martin Charcot dismissed the practice as alternately pathological or imaginary.[182] Roger Lockhurst argues that such 'trance texts' do not simply employ mesmerism to represent anxieties over the degeneration and breakdown of the subject, but in fact explore alternative dynamic new states of subjectivity.[183] The 'remote control' mesmerism conducted by the Beetle echoes the 'telepathic hypnotism' practised by members of the London-based Society for Psychical Research, 'established to scientize the supernatural' in 1882.[184] Although mocked as the 'Spookical Society', the SPR and its members put forth an '*inverted* model of the Victorian self', as they valued dreams, altered mind states and hypnotic trance as 'revealing glimpses of new evolutionary advances in the powers of the mind'.[185] As such, they suggested that hysterics and degenerates – those Charcot deemed susceptible to mesmerism – were in fact *pro*generate, advanced in their connection to other mental states.[186]

The overlap of evolutionary thought and supernatural examinations and their shared novel implications for identity found footing in the nascent field of

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[179] Shermer, 180. Emphasis in original.
[180] Warner, 18.
[181] Winter, 7, 8.
[182] Roger Lockhurst, 'Trance-Gothic, 1882-1897', in Ruth Robbins and Julian Wolfreys, eds, *Victorian Gothic: Literary and Cultural Manifestations in the Nineteenth Century* (Basingstoke, UK: Palgrave, 2000), 148.
[183] Lockhurst, 159, 150.
[184] Lockhurst, 159, 153.
[185] Lockhurst, 153. Emphasis in original.
[186] Lockhurst, 153. Lockhurst suggests that Marjorie Lindon's demonstration of proper gender alignment with her susceptibility to mesmerism marks her as progenerate. Lockhurst, 161.

psychology, beyond its typical late nineteenth-century grounding in physiology.[187] From the early Victorian period, mesmerists categorised their practice as psychology; in the second half of the century, Spiritualists used the term to cover supernatural mental states and experiences.[188] Psychical research, more critical than Spiritualism in examining the workings of the human mind, contributed productively to the study of altered mental states via the expanding science of mind – in the 1890s one of the SPR's presidents was American psychologist William James and Sigmund Freud was an affiliate.[189] On phenomena from epilepsy to ghost sightings, hypnotism, telepathy, and second sight, literary historian Anna Neill writes: 'Scrutinized scientifically, these strange and often marvelous psychical productions could be exposed as nervous epiphenomena and yet, on the other hand, highlight the unfathomable gifts of the mind, thereby reintroducing spiritual questions to empirical investigation.'[190] In both its evolutionary and its more mystical explanations, the role of uncanny mental states relates to the perplexing consciousness of insects. The unique intelligence of social insects such as ants and bees provided a perplexing model for such study, as debates ensued over such insects' mental faculties and the relative role of instinct.[191] The entomologists John Lubbock and Francis Galton, among others, founded the laboratory for experimental psychology at University College, London, one of the first of its kind in the UK, in 1897.[192] Insects went on to have a strong presence in Freud's interpretations of dreams, while for Carl Jung 'the unconscious was an insect'.[193]

Metamorphic Femininity and Art Nouveau

Supernatural phenomena were at once science's other and its outcome: 'positivistic science had *itself* produced the legitimation for a re-

[187] See Janet Oppenheim, *The Other World: Spiritualism and Psychical Research in England, 1850-1914* (Cambridge: Cambridge University Press, 1985), *passim*.
[188] Oppenheim, 239.
[189] Oppenheim, 245.
[190] Neill, 5.
[191] Clark, 37.
[192] Clark, 95.
[193] Charlotte Sleigh, 'Inside Out: The Unsettling Nature of Insects', in Eric C. Brown, ed., *Insect Poetics* (Minneapolis: University of Minnesota Press, 2006), 283.

supernaturalization of psychology', writes Lockhurst.[194] Similarly, Winter argues that instead of presenting an alternative or other to legitimate science, animal magnetism 'called into question the very definition of legitimacy itself'.[195] On the fluid exchange of empiricism and supernaturalism in novels such as *The Beetle*, Hurley writes, 'Science is gothicized, and gothicity is rendered scientifically plausible'.[196] And Tzvetan Todorov states that in fantastic literature metamorphoses 'constitute a transgression of the separation between matter and mind as it is generally conceived'; this transgression is frequently invoked in human-animal metaphors through which the supernatural is consequently triggered.[197] Meanwhile, positivistic science drew parallel links of its own, for example in Grant Allen's hypothesis of the evolutionary acquisition of female intuition, in which he paints woman as a variation on the noble savage.[198] Ironically, the feminine other was at once tied to the material and the ethereal; this paradox is epitomised in the process of metamorphosis.

The amalgamation of science and the supernatural, their shared symbolism of metamorphosis and its feminine connotations at the *fin de siècle* are visually and materially encapsulated in Art Nouveau. In their eschewal of the historicism prevalent among dominant design styles earlier in the century, designers emerging in the early 1890s attempted to replace historical motifs with natural ones: in effect, seeking ahistoricity through nature.[199] However, the natural was on a continuum with the supernatural, as designers drew on myth and folklore, achieving a mixed iconography of ancient and modern, naturalistic and fantastic. Critics condemned Art Nouveau's 'particular use of nature, history and symbolism'; its writhing forms and confusing geometry suggested 'an altogether other desire for gratification and a larger ideological agenda'.[200]

Émile Gallé's 'psychological modernism' is a case in point.[201] Fascinated by the 'unstable, fluid, and visual qualities of mind' suggested by hypnosis and the new psychological work on the unconscious, he described his work as evoking

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[194] Lockhurst, 154. Emphasis in original.
[195] Winter, 5.
[196] Hurley, 20.
[197] Tzvetan Todorov, *The Fantastic: A Structural Approach to a Literary Genre*, trans. Richard Howard (New York: Cornell University Press, 1975), 113.
[198] Allen, 336, 339.
[199] 'The Nature of Jewellery', *The First Moderns: Art Nouveau, from Nature to Abstraction*, exhibition text (Sainsbury Centre for Visual Arts, Feb. 2012-Dec. 2013).
[200] Paul Greenhalgh, 'Introduction', in Greenhalgh, ed., *Art Nouveau 1890-1914*, exh. cat. (London: V&A, 2000), 22, 23.
[201] Debora L. Silverman, *Art Nouveau in Fin-de-Siècle France: Politics, Psychology, and Style* (Berkeley: University of California Press, 1989), 229.

the 'spirit latent beneath phenomena'.[202] In addition to the new psychological ideas, Gallé like other Art Nouveau designers was equally influenced by developments in natural history, in particular evolutionary theory, as manifest in themes of transformation in nature. Plant and animal forms suggesting fossils and microscopy mirrored recent scientific findings. Dragonflies formed one of the most repeated motifs in all facets of Art Nouveau design; fossils differing little from modern species were found in tertiary strata and the Lower Lias (rock from the Early Jurassic era).[203] Along with their popularity in Japanese art, primitive associations surely fed the imagination of designers – remains of a similar insect was found in Carboniferous strata with a wingspan measuring two feet across.[204] An early vase by Gallé combines influences from the Far East and deep time: set on a bronze chinoiserie stand, the thick opaline glass is imprinted with an all-over Japonesque scale pattern and decorated with stylised dragonflies in flight in polychrome enamels and gilding (fig. 5.40). Though embellished with colourful arabesques, the dragonflies' cellular wing patterns and segmented bodies, legs and antennae suggest fossil forms. Gallé, who studied botany and insect life, used a microscope to inform his designs.[205] As well as fossils, the raised brick-like forms suggest the 'ovular presence of cell life', the design at once primitive and generative.[206]

Gallé's work expresses the unknowability of nature, as he sought to 'capture the impalpable'.[207] Seemingly charged with symbolism, or '[f]ull of messages to be deciphered', one critic labelled his designs 'hieroglyphs of nature and feeling' – recalling the indexical beetles of the Insect Gallery and Marsh's encrypted villain – and '[a] precious art that transforms what he touches into talking jewels!'[208] His influence was felt on a generation of younger designers, including glassmaker François Décorchemont, whose series of beetle vases feature highly realistic insects in high relief set against ethereal semi-opaque grounds of subtly gradated pastel hues (fig. 5.41). Achieved using the *pâte de*

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[202] Silverman, 235; Émile Gallé, *Écrits pour l'art* (Paris: Laurens, 1908), 183, quoted in Silverman, 232.
[203] British Museum (Natural History), *Guide to the Exhibited Series of Insects*, 38.
[204] British Museum (Natural History), *Guide to the Exhibited Series of Insects*, 39.
[205] 'The New Art and the New Science', *The First Moderns: Art Nouveau, from Nature to Abstraction*, exhibition text (Sainsbury Centre for Visual Arts, Feb. 2012-Dec. 2013).
[206] Paul Greenhalgh, 'The Cult of Nature', in Greenhalgh, 66.
[207] Gallé, *Écrits*, 153, quoted in Silverman, 232.
[208] William Warmus, William Warmus, *Emile Gallé: Dreams Into Glass*, exh. cat. (Corning, NY: Corning Museum of Glass, 1984), 23; Louis de Fourcaud, 'Les Arts décoratifs aux Salons de 1894', *Revue des arts décoratifs* 15 (1894-95), 2, quoted in Silverman, 241.

verre technique of firing powdered glass in a mould, favoured by Gallé to effect his trademark mysterious colour gradations, the delicate yet degraded effect of the glass combined with the startling realism of the agate beetles cause Décorchemont's organisms, like Gallé's, to appear at once as 'dreamlike symbols and living creatures'.[209]

Despite Gallé's mystical esotericism, this 'metaphysical metamorphosis' is not, as some have suggested of French design in this period, necessarily reactionary or at odds with evolutionary theory.[210] Other artists sought out the context of humankind within evolution and nature, as well as the related role of unknown mental states. In keeping with the prominence of the female as mesmeric subject and Spiritualist medium, due to perceived susceptibility to altered states of mind, the enigma of the unconscious was by and large represented by the figure of woman. As such, the Art Nouveau woman was typically portrayed with closed or half-closed eyes, equally suggestive of the charged sexuality that ran through her flowing hair and dress. As in his iconic posters, Alphonse Mucha's gilt bronze lamp *The Distant Princess (Mask with Scarabs)* (c. 1900), with its energetic integration of swirling tresses, blown drapery and exotic blooms surrounding the heavy lidded woman's face is emblematic of such hedonistic organicism (fig. 5.42). The scarabs carved from glowing green malachite that dangle from her headpiece at once are reminiscent of beetle jewellery and appear as integral to the woman.

The insect as a symbol of natural and psychological metamorphosis is routinely feminised in Art Nouveau. A bronze inkwell by the Austrian designer Carl Kauba features a large moth resting upon a flowered hillock base. However, when opened, the moth reveals itself to be a winged nymph (figs 5.43, 5.44). The delicate openwork wings, probably originally decorated with enamel, are operated by a spring mechanism that opens the moth's initially closed wings to a full spread on the nymph.[211] The vessel, an object commonly employed to explore metamorphosis,[212] takes on a sexual charge in its very function, metamorphic and erotic in both form and subject matter.

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[209] Warmus, 130.
[210] Greenhalgh, 'The Cult of Nature', 68. See Lynn Gamwell, *Exploring the Invisible: Art, Science, and the Spiritual* (Princeton, NJ: Princeton University Press, 2002), 33-55.
[211] Penny Johnson, *Art Nouveau: The Anderson Collection* (Norwich: Sainsbury Centre for Visual Arts, University of East Anglia, 1984), 24.
[212] Greenhalgh, 'The Cult of Nature', 65.

The hybrid as an embodiment of the fantastic within nature was most prolifically realised in the jewellery of René Lalique. Lalique's dramatic and intricate melding of human, animal and plant forms signalled a radical transformation in French jewellery design when he first exhibited at the 1895 Paris Salon. Responses, however, were mixed. When his famous *Dragonfly Woman* (figs 5.45, 5.46) was shown at the *Exposition Universelle* of 1900, critics balked at its size (27 x 26.5cm) and subject matter: 'Very remarkable, and startling to the observer, but is it jewellery?', questioned one English viewer.[213] The bewildering iconography of the large corsage piece challenged the very medium of jewellery and its distinction from art. The helmeted bust of a bare-breasted woman is in the process of being swallowed by a dragon-like beast with large griffin's talons and a dragonfly's tail. However, more than a victim, the carved apple-green chrysoprase feminine form, with large dragonfly wings sprouting from her shoulders and scarab beetles on either side of her helmet, forms an integral component of the hybrid. Rather than devoured, she may be seen as emerging from the creature's jaws in a process of birth, or rebirth. Either way, the piece suggests the eternal unity of nature – spots on the wings resemble the eye of the peacock feather – and its cycles of life and death. Reflecting the perception of insects and their processes throughout the later decades of the nineteenth century, the *Dragonfly Woman* is both strikingly beautiful and abjectly terrifying.

Lalique clearly relished the overlap between natural science and the uncertain territory of myth suggested by the process of metamorphosis.[214] Even his use of materials, which marks a significant departure from traditional jewellery design arranged around a central gemstone – especially a diamond – can be seen as metamorphic.[215] The use of biomorphic, shapeshifting materials and stones, such as opal and moonstone, emphasised themes of instability; each wing is jointed in four places, which when worn would have resulted in a quivering effect in a sort of kinetic biomorphism comparable to that of the butterfly

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[213] 'Jewellery at the Paris Exhibition', *The Jewellery and Metalworker* (1 June 1900), 712, quoted in Clare Philips, 'Jewellery and the Art of the Goldsmith', in Greenhalgh, 244. Little is know about who if anyone actually wore the *Dragonfly Woman*. Although it has been rumoured that the bust is based on the actress Sarah Bernhardt, there is no evidence behind this idea. However, it may have once been worn by Bernhardt, who was a friend and fan of Lalique's. Maria Fernanda Passos Leite, curator, Calouste Gulbenkian Museum, email correspondence (11 Oct. 2013).
[214] Beer, 98.
[215] Maria Fernanda Passos Leite, *René Lalique at the Calouste Gulbenkian Museum* (Milan: Skira, 2008), 21.

'trembler' hairpins.[216] Meanwhile, any naturalism was offset with the intense opulence of materials such as lavish gilding, luminescent enamel and brilliant diamonds.

That a woman is at the centre of this anarchic and decadent interpretation of nature and its dual themes of creation and destruction is typical of French Art Nouveau. Like natural history collecting, insect jewellery and gothic fiction, such designs' adamant location of the feminine within natural processes responded to an intensified urban life and its innate anxieties. Although the threat of the New Woman in Britain in the later years of the nineteenth century may have been exaggerated, between 1889 and 1900 feminist activity swept France, coinciding with a decline in the birth rate, and leading to doctors, politicians and journalists' condemnation of the *femme nouvelle* and celebration of the traditional female role.[217] According to art historian Deborah Silverman, women's newfound access to higher education and professional careers along with new divorce laws 'threatened essential divisions ordering bourgeois life: public from private, work from family, production from reproduction'.[218] The resultant images of the animalistic *femme fatale* in Symbolist painting and Art Nouveau have been examined in depth.[219] Lalique's insect-woman, more icon of nature's chaos than human subject, exemplifies the artistic response to shifting gender roles.

However, by examining the specific implications of insect life, it is possible to analyse the significance of the *Dragonfly Woman* beyond the familiar narrative of attempts to qualm threats of the 'predatory' New Woman by cementing her back into the cycle of nature. As art historian Paul Greenhalgh writes, in Art Nouveau, 'Nature became a force in the anarchic quest for modernity'.[220] By the end of the century the tenets of evolution had been translated into various scientific arenas, including psychology, sociology and even technology. 'Thus, perversely, the force of nature could be witnessed as being at its most potent in the voracious hearts of Europe and North America's expanding urban centres'.[221] Art Nouveau in particular demonstrates the paradoxical embrace

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[216] Passos Leite points out that such joints would have also made the giant brooch more comfortable against the breast of the wearer. Passos Leite, email.
[217] Showalter, 7, 39.
[218] Silverman, 63. Also see Tamar Garb, *The Body in Time: Figures of Femininity in Late Nineteenth-Century France* (Seattle: University of Washington Press, 2008).
[219] See Bram Dijkstra, *Idols of Perversity: Fantasies of Feminine Evil in Fin-de-Siècle Culture* (Oxford: Oxford University Press, 1986).
[220] Greenhalgh, 'The Cult of Nature', 69.
[221] Greenhalgh, 'The Cult of Nature', 69.

of atavism and technology. Integral to imaginings of Braidotti's women-insects nexus is the machine: insects such as ants, wasps and beetles suggest highly adept engineering and developed mechanisms of combat; the territorial formations of ants and wasps or the sophisticated armour of the stag beetle invoke the war-machine. The combined associations of primitivism and machinery result in 'insects as technological artifacts, or entities that stand in between the organic and the inorganic'.[222]

Braidotti locates this connection especially in the realm of insect sound.[223] Distinguishing insect life's modern resonances from other animals, she draws on Deleuze and Guattari's characterisation of insects as harking a new era: '[T]he reign of birds seems to have been replaced by the age of insects, with its much more molecular vibrations, chirring, rustling, buzzing, clicking, scratching and scraping'.[224] The subversive quality Braidotti locates in insect sound is echoed by the alluring but dangerous music of *The Beetle's* Lady of the Songs, described as 'indescribably weird and thrilling'.[225] While summoning a primordial feminine otherness, perhaps much like the Beetle's harbinger of a brave new urban existence, one of uncanny defamiliarisation and the possibilities of mass destruction at the tip of one's fingers, the insectile Art Nouveau *femme fatale* invokes future hybrids, the machinic other. Instead of an overwrought Gaia figure, reduced and restricted to timeless nature, Lalique's *Dragonfly Woman* with her restless processes might signify the driving forces of technology, the smooth classicism of the bust at once impervious to and powerless against the encroaching forces of nature in the guise of modern society. Perhaps she is more proto-cyborg than chimera.

Conclusion

The apparent amorality of Lalique's themes led English critics to disapprove of what they saw as decadence.[226] The interpretation of the dual aspects of metamorphosis – naturalism and supernaturalism – that achieved its logical

[222] Braidotti, 152.
[223] Braidotti explores the insect model within contemporary electronic music, clearly outside the boundaries of this chapter. Braidotti, 154-57.
[224] Deleuze and Guattari quoted in Braidotti, 154.
[225] Marsh, 239.
[226] Philips, 249.

conclusion in Art Nouveau sheds light on the implications of insect life and its amazing processes at the end of the century, whether in beetle fashions, shapeshifting literary villains or the changing displays of the Natural History Museum. The shift from women's adornment with 'scientific' beetle jewellery from mid-century to fantastical dramatisations of metamorphic adornment in *Macbeth* and the complex natural-mythic hybrids of *fin-de-siècle* Art Nouveau is paralleled by the transformation undergone in the Insect Gallery: the supplementation of the insect drawer and its pinned down subjects with increasingly dynamic, suggestive displays featuring insect models and paraphernalia – the nests they build, wood they burrow, eggs they lay and from which they hatch, cocoons in which they metamorphose – all indices to their intriguing behaviour and consciousness. Focussing ever more on the interrelationships between insect and human life, the Museum's displays, like the then commonly accepted evolutionary theory, existed on a continuum with the monstrous imaginings of literary fiction and creative design: just as women with specimen drawers apparently tipped onto their dresses encountered the source of their adornment in the Natural History Museum's cabinets, readers of Marsh and consumers of Gallé and Lalique would have recognised common narratives in models of metamorphosis. Such narratives corresponded to implications for the individual in light of emerging theories of the mind – and insects' significance to these theories – and changing and ruptured social realities for Britain and the Empire, as worked out in literary and artistic adaptations of metamorphosis.

At the turn of the century, such changes and ruptures were unpredictable and disorderly, mired in the past as much as the future. The non-linear pattern of this becoming suggests an alternative to a phallic model of progress. Inserting the Latin root *mater*, the psychoanalyst Bracha Ettinger posits a pre-Oedipal process of *metra*morphosis that distinctly relates to feminine sexuality and the 'becoming-thresholds of borderlines'.[227] As opposed to phallic oneness, totality and sameness, arising out of Oedipal symbolic castration, Ettinger's dual concept of matrix – a distinct feminine stratum of subjectivisation – and metramorphosis involves multiplicity, plurality, partiality, difference, strangeness, relations to the unknown other and change to borderlines.[228] This feminine resonance corresponds to *fin-de-siècle* interpretations of insect life and the process of metamorphosis, as

[227] Bracha Lichtenberg Ettinger, 'Matrix and Metramorphosis', *Differences*, special issue: Trouble in the Archives, ed. Griselda Pollock, 4.3 (1992), 176.
[228] Ettinger, 178.

symbolic of non-linear renewal, the dissolution of boundaries and radical otherness, for example in the destabilised identities in *The Beetle*, the sexual anarchy of the New Woman, the permeable subject ascertained by mesmerism and the shapeshifting generative/destructive Art Nouveau *femme fatale*.

By the start of the new century these chaotic formations of identity had settled down and yet again transmorphed, with the political unrest, colonial uncertainty and diplomatic clashes of the European nation-states in the years leading up to the First World War, and female suffrage becoming a closer reality.[229] When the life history of insects once again provided literary inspiration for Kafka's 1915 novella, it was now the basis of an interior existential struggle for the protagonist Samsa, in his plight of being inexplicably transformed into 'monstrous vermin'.[230] Just as animal magnetism and Spiritualism had been absorbed into the new psychological sciences, the societal menace of the insect imaginary had been internalised in what is arguably a masculinised narrative, far removed from the monstrous feminine met(r)amorphosis of *The Beetle* and its implications for an infringed Empire. A 1927 photograph taken in the Natural History Museum's central hall shows a group of young women surrounding a display on fleas and plague (fig. 5.47). Presumably an educational group, the uniform heads in their cloches are all directed intently towards the giant models of fleas and their larvae. These brethren of Samsa's cockroach, oversized vectors of disease in a square vitrine, suggest an altogether other logic from the jewel beetles lined up in Wallace's case from the previous century, no longer fetishised objects of 'colopterous epistemophilia' but now infiltrating agents of war and pestilence in a new era of didactic science.[231]

[229] Women gained the vote in England in 1918, 1944 in France.
[230] Kafka, 1.
[231] Schmitt, 'Beetlemania', 40.

Femme Fatales and Dippy Dinosaurs

'Female Animals Portrayed as "Femmes Fatales" by Researchers'.[1] So reads the headline of a February 2013 news story from the University of St Andrews. The article cites a study into the stereotyping of gender roles in animals within recent zoological research. While males are usually unduly ascribed strong and active characters and females weak and passive ones, these qualities are flipped when it comes to animals that practice sexual cannibalism – for example, the praying mantis or the black widow. Researchers frequently describe the females of such species in negative terms such as 'aggressive', 'voracious' and 'rapacious'. As well as evoking the *femme fatale* of *film noir*, such stereotypes can clearly be traced back to Victorian attitudes. Some studies are less covert: researchers studying 'sexual dishonesty' practised by female praying mantises have formulated a 'Femme Fatale hypothesis'.[2] Such examples demonstrate the continued perpetration of ideas about gender and nature that this thesis locates in the Natural History Museum and surrounding culture. Our contemporary culture both sustains and rivals the Victorian anthropomorphisation of animals, with examples ranging from animated films for children by Disney with lions embracing in the missionary position to David Attenborough's heteronormative and moralistic scripts of male-female animal couples' 'parental duties' in BBC nature documentaries.[3] These tendencies trace to professional scientific practices and are relayed in their popular outposts, including the Natural History Museum.

As I write this a petition is growing to save 'Dippy' the dinosaur – in fact a cast of a diplodocus skeleton – from imminent removal from its pride of place for the past three and a half decades in the Natural History Museum's central hall

[1] 'Female Animals Portrayed as "Femmes Fatales" by Researchers', *University of St Andrews website: News* (28 Feb. 2013) <https://www.st-andrews.ac.uk/news/archive/2013/title,214845,en.php> accessed 25 June 2015.
[2] Katherine Barry, biologist, quoted in Zoe Gough, 'Hungry Mantises are Nature's Femmes Fatales', *BBC Earth: Nature's Wonders* <http://www.bbc.com/earth/story/20141217-hungry-mantises-are-most-attractive> accessed 26 June 2015.
[3] See Brett Mills, 'The Animals Went in Two by Two: Heteronormativity in Television Wildlife Documentaries', *European Journal of Cultural Studies* 16.1 (Feb. 2013), 100-114.

(fig. 6.1).[4] Dippy is almost universally gendered male – including by Natural History Museum director Sir Michael Dixon himself. Dixon claims that being 'in the middle of a building', Dippy is 'out of context', so the Museum hopes to install a weatherproof replica of the cast outside: 'This [will] be about putting him in a story of his own time.'[5] This baffling explanation, with its ironic combination of anthropomorphism and naturalism, is reminiscent of rhetoric surrounding the installation of the nesting bird groups in the Natural History Museum 131 years prior. However, the public outcry against Dippy's removal demonstrates that much like objects displayed in the Museum in the 1880s and 90s transcended their ostensible purpose as illustrations of didactic texts, the skeleton cast functions as a semiophore: it bears meaning in and of itself, even 'out of context'.[6] The auratic resonance of objects in the Natural History Museum underlies Dixon's rationale for replacing the cast with a twenty-five metre long blue whale skeleton: Dippy is 'not actually a real dinosaur whereas the whale will be the real thing. Which I think is important'.[7]

Moreover, the whale – which will be suspended dramatically from the ceiling (fig. 6.2) – is intended to convey an environmental message, as part of what the Museum calls its 'three big narratives': the origins and evolution of life, the diversity of life on Earth today, and the long-term sustainability of the planet.[8] The transformation can therefore be seen as a manifestation of museums' perceived need to stay relevant. But what about the narrative of the museum itself? As a product of the 'scientific and colonial ambition' that reached its 'climactic moment' in the second half of the nineteenth century, the museum today is a relic – a museum piece – from the Victorian era whence it came.[9] Correspondingly, Mieke Bal has critiqued the American Museum of Natural History for ignoring its own problematic histories and hence tacitly upholding the

[4] 'Petitioning Natural History Museum: Save Dippy', petition mounted by Metro UK, *Change.Org* <https://www.change.org/p/natural-history-museum-save-dippy> accessed 27 June 2015.
[5] Michael Dixon, director, Natural History Museum, quoted in Sarah Knapton, 'Natural History Museum Dinosaur 'Dippy' Switched for Blue Whale Skeleton', *The Telegraph* (29 Jan. 2015) <http://www.telegraph.co.uk/news/science/science-news/11375088/Natural-History-Museum-dinosaur-Dippy-switched-for-blue-whale-skeleton.html> accessed 27 June 2015.
[6] Krzysztof Pomian, *Collectors and Curiosities: Paris and Venice, 1500-1800*, trans. Elizabeth Wiles-Portier (Cambridge: Polity Press, 1990), 4.
[7] Dixon quoted in Knapton.
[8] Natural History Museum, 'Strategy to 2020', *Natural History Museum website: Our Vision* (2015) <http://www.nhm.ac.uk/content/dam/nhmwww/about-us/our-vision/NHM%20Strategy%20to%202020.pdf> accessed 28 June 2015.
[9] Mieke Bal, 'Telling, Showing, Showing Off', in *Double Exposures: The Subject of Cultural Analysis* (New York: Routledge, 1996), 17.

colonialist othering of the non-Western and the 'natural' upon which it was founded.[10]

By trumpeting the continued relevance of its collections and research via the twofold 'truth-speak' of realism and scientific discourse, the Natural History Museum in London ironically risks inducing its own obsolescence.[11] Finalised in 2009, the state-of-the-art Darwin Centre with its 'cocoon' architecture and potential for educational visitor encounters with working researchers largely sits empty six years later (fig. 6.3); its unpeopled bright white modernist spaces contrast against the throbbing Victorian corridors and 1970s displays of the adjacent original building. Meanwhile, the changing displays of the central hall since W.H. Flower first realised the Index Museum reveal successive paradigms of popular science: from late Victorian exploration with the sperm whale (fig. 6.4) through the early twentieth-century trophy-hunting colonialism of the African elephants (fig. 6.5) – for a time complemented by two mounted elephant heads flanking the great staircase – to the late twentieth-century entertainment and infantilisation of scientific display with 'Dippy'. The installation of the blue whale by summer 2017 appears to be an attempt to replace these outdated narratives with one pertaining to current concerns over climate change and related environmental devastation. And yet, true to Richard Owen's vision, these various incarnations all employ superlative specimens, frequently displayed in aggressive poses and commonly gendered masculine – one writer even refers to the blue whale skeleton as 'he' despite acknowledging that it is a female specimen.[12] However, while the Museum's 'Strategy for 2020' acknowledges the institution's rich history, it discusses it in terms of evolution and revolution, maintaining the same narrative of progress promoted in Museum literature of the late nineteenth century.[13] By evading critical self-reference, the museum itself remains invisible.

The Artist's Natural History Museum

As institutions such as the Natural History Museum largely eschew self-criticism, and their historians reiterate official narratives, engagement with these more

[10] Bal, 13-56.
[11] Bal, 50.
[12] Knapton.
[13] Natural History Museum, 'Strategy to 2020'.

problematic cultural histories is largely left to artists. While the Natural History Museum itself has initiated several artistic projects and even a Centre for Arts and Humanities Research, the outcomes frequently respond more to the history of science than to the history of the museum, and therefore risk reasserting institutional complacency.[14] Furthermore, while a fascination with historical display practices has increasingly taken hold within contemporary art, much of this type of practice risks actively fetishising the parameters of exhibition, whether within the cabinet of curiosities or Victorian taxonomy.[15] While some 'vitrine art' engages with different models of exhibition and classification to effect epistemological critique of the legacies of display in modern and contemporary culture, here I would like to consider a few examples of art that steps outside of the box as it were, mobilising not only the relationship of objects on display but also sometimes creating immersive environments.

London-based Polish artist Goshka Macuga critically deploys the role of the artist as curator, by incorporating artworks by other artists in her work as well as found objects, including from nature. As such, her work challenges notions of authorship and nature/culture distinctions and the hierarchies implicit in both. Commissioned for the 2006 Liverpool Biennale, *Sleep of Ulro* brought together such seemingly disparate forms as German Expressionist film sets, William Blake, the Hermitage, anatomical models, antiquarian prints, Theosophy, fungus and the Wizard of Oz in a temporary architectural complex that in effect became an institution unto itself (fig. 6.6).[16] The structure was inspired by a tiered vision of heaven, hell and purgatory. In its union of art, science and religion within self-conscious methods of exhibition design, the work reflects on how these broad fields have each contributed to a modern exhibitionary paradigm. A levitating

[14] An exception is programming by Bergit Arends as former curator of contemporary art at the Natural History Museum. This included Tessa Farmer's 2007 residency and exhibition *Little Savages*, which literally dismantled taxidermy displays and thereby Victorian exhibition practices and their epistemological legacy. For more on this project and its relationship to the NHM, see Petra Lange-Berndt, 'A Parasitic Craft: Taxidermy in the Art of Tessa Farmer', *The Journal of Modern Craft* 7.3 (Nov. 2014), 267-84. For more on the Natural History Museum's Centre for Art and Humanities Research, see 'Centre for Art and Humanities Research', *Natural History Museum website: Research and Curation* <http://www.nhm.ac.uk/research-curation/science-facilities/cahr/index.html> accessed 30 June 2015.

[15] On the cabinet of curiosities and contemporary art, see Marion Endt, *Reopening the Cabinet of Curiosities: Nature and the Marvellous in Surrealism and Contemporary Art*, Ph.D. thes. (University of Manchester, 2008), 7-26, 183-211. On the influence of museums on contemporary art, see Kynaston McShine, ed., *The Museum as Muse: Artists Reflect*, exh. cat. (New York: Museum of Modern Art, 1999), and James Putnam, *Art and Artifact: The Museum as Medium*, 2nd edn (London: Thames and Hudson, 2009).

[16] Bryony Bond and Fiona Boundy, eds., *Goshka Macuga: Sleep of Ulro* (Rotterdam: Veenman, 2008).

Madame Blavatsky, co-founder of Theosophy, seems perfectly congruous with mushrooms sprouting in a vitrine and potted orchids set atop tripods (figs 6.7, 6.8). In 'Heaven', a raised white hexagonal room upheld by elaborate scaffolding, a central display structure echoes the surrounding shape, with a large white light fixture affixed to the ceiling above (fig. 6.9). With its seemingly charged array of material including wax botanical models, taxidermised animals and archival manuscripts, the installation is reminiscent of Flower's displays in the Natural History Museum's central hall: 'Heaven' functions as an index museum itself, with its own logic and teleology, culturally inflected and construed from objects that function auratically as much as didactically. The reverent treatment of objects in *Sleep of Ulro*, whether artworks or artefacts, found or 'natural', has a levelling effect: all become jewel-like, all take on a sense of mounting upwards.

While largely drawing on archival research, Macuga's treatment of objects comes across as esoteric. For *Objects in Relation* at Tate Britain in 2007 (fig. 6.10), while Macuga researched the Unit One group of British artists founded by Paul Nash in 1933 in the Tate archives, the exhibition of the artists' work with seemingly unrelated material expands the art historical narrative to less predictable associations resulting in broadened ideas about art, modernism, nationalism, nature and gender. For this work Macuga employs objects from nature that appear to presage modernist abstraction, much like corals and ants' nests in the Natural History Museum's late ninteteenth-century galleries; by naturalising elements of display, these draw attention to the breakdown of distinctions between nature and artifice. These objects are furthermore heavily and knowingly anthropomorphised: two tree branches standing upright as if on two legs – one wears red trainers – are titled 'boy' and 'girl'; they mirror the male-female relationships connected to the group, for instance between Henry Moore and Barbara Hepworth, and Nash and Eileen Agar. This particular mobilisation of objects deconstructs the linear logic of modernism and its retelling, imbuing the past with potential alternative narrative structures. While the motley collections of naturalia and artificialia in Macuga's work resonates with the *wunderkammer*, they ultimately seem more embroiled in the conflict between inner and outer spaces that Dorinda Outram claims replaced the

'curiosity' of earlier natural history: these spaces range from the archive and the exhibition to the field and the body.[17]

Thus, in subtler ways, anthropomorphism transcends the object to the display structures themselves. The embodied exhibition and its implicit conflicts between nature and artifice are epitomised in the work of the Canadian-born New York-based sculptor David Altmejd. In Altmejd's disorientatingly metamorphic installations, the object and the display and hence nature and culture meld together inextricably. *The Index*, created for the Canada Pavilion at the 2007 Venice Biennale, explodes the confines of modern display practices – cabinets, shelves, steel grids and Perspex cases are encroached by stalactitic mirrored structures, which also emerge from apparently decomposing furry bodies, werewolves to be precise (fig. 6.11).[18] Taxidermised birds and woodland animals perch amid the complex structure; artificial plant life 'grows' from its synthetic surfaces; black fungal forms merge with dildos and butt plugs: overlooking this motley domain is a life-sized birdman wearing a suit and tie, his hairy flesh-coloured wattle uncannily resembling a human scrotum. Referencing Robert Smithson's mirror works, which unlike their Minimalist forebears employed materials found in nature to mobilise the logic of the 'non-site', Altmejd invokes the entropic gaze of modernism (fig. 6.12).[19] However, with the sculpture's blatant sexual innuendoes of fungal sex toys and phallic birdmen, Altmejd queers this gaze and its basis in exhibitionism, as implying a separation of nature from such human activities. Part of a recurring theme of the werewolf in his work, in which lyncanthropic bodies and body parts sprout crystals and wear Timex watches, hairy limbs and other fragments are intersected by crystal and mirrors, entangling the organic and inorganic, bestowing unanticipated jewel-like associations onto subject matter normally associated with the abject (fine gold chains often connect werewolf anatomy like sinews). Hybrid par excellence, the werewolf queers binaries of gender, species and physics. More than complicating human-animal relationships, Altmejd's work breaks down barriers between animal and non-animal, living and non-living and directs the resulting questions to the display structures of modernism.

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[17] Dorinda Outram, 'New Spaces in Natural History', in Nicholas Jardine, James Secord and Emma Spary, eds, *Cultures of Natural History* (Cambridge: Cambridge University Press, 1996), 264.
[18] See Louise Déry, *David Altmejd: The Index (Montreal:* Galérie de l'UQAM, 2007).
[19] Ann Reynolds, 'Reproducing Nature: The Museum of Natural History as Nonsite', *October* 45 (summer, 1988), 109-27.

The Index and related work thus enlivens a field normally associated with dust and death, and draws attention to the paradox of 'stilled life' on display.[20] Furthermore, the dissolution of boundaries between objects on display and their containing structures causes the organicism of the former to overtake the latter. Since the time of the opening of the Natural History Museum, analogies have been made between the museum and the body: in 1881 Richard Owen referred to the architectural 'anatomy' of the new Museum in South Kensington, drawing a genealogical connection to its 'inherited structures' from its ancestor in Bloomsbury.[21] In 1930 Georges Bataille observed, with a sense of abjection perhaps more in line with Altmejd's seemingly decaying forms: 'A museum is like a lung of a great city; each Sunday the crowd flows like blood into the museum and emerges purified and fresh.'[22] The tongue-in-cheek quality of this statement would not be lost on Altmejd, whose work challenges the utopian narratives of modernist progress and the pristine sterility of its forms. Mirroring *The Index* in the Canada Pavilion albeit a separate work, *The Giant 2* (2007) literalises the display structure as body: the physique of a male giant – hirsute but this time humanoid – is perforated with cavernous holes that both provide shelter to plant and animal 'life', respectively artificial and taxidermised, and form geometrical cabinets of display in themselves (fig. 6.13). The jagged mirrored forms that vie with the apparently decaying flesh centre on the giant's intact genitals. Notwithstanding its undisturbed male virility, butt plugs and fake flowers queer modernist masculinism. This is the disintegrated posthuman subject, whose chaotic geometries and penetration by animal, plant and mineral dismantle a modernist order of vision and its values of rationalism and objectivity.

Some recent work by Altmejd takes a less literal approach to the relationships between humans and objects by circumventing figuration altogether. The complex multi-dimensional web of taut threads in *Le Ventre* (2012), albeit abstract, evokes a dragon-like mythical beast (fig. 6.14). And yet mounted in its Plexiglass vitrine, the chimera also speaks to dialectics of containment and chaos and of the ethereal and corporeal: a cracked-open cantaloupe mounted outside of

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[20] Lange-Berndt, 268. This term also formed the basis for the conference 'Activating Stilled Lives: The Aesthetics and Politics of Specimens on Display', held at University College London, 17-18 May 2012, as part of the Cultures of Preservation AHRC research network led by Petra Lange-Berndt and Mechthild Fend.
[21] Richard Owen, 'Address to the Biological Section of the British Association', York (1881), 10, Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.
[22] Georges Bataille, 'Museum' (1930), *October* 36 (1986), 300, quoted in McShine, 10.

the vitrine, echoing the creature's 'mouth' summons the belly (*ventre*) of the beast. Juxtaposed against the diaphanous thread matrix, such 'real' objects invoke the entangled material-discursive networks through which things come into being, resonating with Karen Barad's theory of agential realism, in which phenomena are mutually generated through intra-action.[23] Thus there is a potential for queering beyond the confines of human sexuality, and into fields of time, space and matter. Futuristic forms such as these speak to the potential of chimeric objects of the Natural History Museum and their complex web of associations and information exchanged with agents and objects outside of their purportedly scientific contexts.

Other artists' work corresponds less to the structures of display that comprise the legacy of natural history museums and more to the currency of objects contained within. London-based sculptor Kate MccGwire repurposes feathers and their particularly evocative surfaces. In works such as *Skirmish* (2015), the domed glass case reiterates the familiar display method of Victorian taxidermy, and yet the contents are made strange: large worm-like forms covered in various colourful feathers interlock in an apparently writhing embrace (fig. 6.15). Although appearing abstracted, dissociated from their original animal form, the feathers take on a sense of life beyond the stilled simulacrum of taxidermy. Each form or 'species' with its distinctive markings recalls the 'endless forms' of Darwinian evolution, each exquisite pattern the end result of sexual selection.[24] This distilled sense of nature's artistry based in desire marks the fulcrum of human-animal entanglement, manifest in everything from the twitcher's love of birdsong to Victorian women's self-adornment with plumage to the 'art of taxidermy' in the natural history museum. Elizabeth Grosz writes that sexual selection's becoming-other of seduction entails 'a fundamentally dynamic, awkward, mal-adaptation that enables the production of the frivolous, the unnecessary, the pleasing, the sensory for their own sake'.[25] While sexual selection took a backseat in twentieth-century evolutionary science, its return to attention in the twenty-first century has influenced sociobiologists and evolutionary psychologists, whose reductionist and at times ideologically driven

[23] Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007), 203.
[24] Charles Darwin, *On the Origin of Species* (1859), ed. Gillian Beer (Oxford: Oxford University Press, 2008), 360.
[25] Elizabeth Grosz, *Chaos, Territory, Art: Deleuze and the Framing of the Earth* (New York: Columbia University Press, 2008), 7.

attempts to provide scientific explanations for human behaviour picks up where Victorian social Darwinists left off.[26] Grosz's concept of sex as art as excess provides an alternative model of understanding the role of biology in sexual difference and its infinite intriguing configurations.

In summer 2015 the V&A, formerly the South Kensington Museum, is experiencing unprecedented demand for the exhibition *Alexander McQueen: Savage Beauty*, which features the late British designer's dramatic latter-day feather fashions. Cultural geographer and curator Merle Patchett criticises McQueen's fantastical and grotesque designs for manifesting misogyny and animal cruelty; she writes that his 'avian inspired creations continue to reproduce the same issues to do with dress, gender, distribution of wealth and power that the feather fashions of the past were entangled within'.[27] By foregrounding the materiality of the products of sexual excess in 'nature' and its contexts of display according to the Victorian cultural legacy, MccGwire, like Macuga and Altmejd, subtly extracts the gendering of natural history display and its embodiment of queer nature, while distilling its fetishistic tendencies that remain problematic to this day.

Museum Metamorphosis[28]

Whether through unexpected intellectual juxtapositions, psychedelically exploded frameworks or sumptuously refashioned materialities, the artworks considered here all enliven natural history displays in spite of their traditional status as objectively locked in time compared to the culturally reflexive art museum. In each instance the artist highlights the jewel-like status of changeable, human inflected objects, dismantling binaries between science and art, nature and culture, human and animal, organic and inorganic, life and death, subject and object. Ultimately this entails a challenge to the conventional distinction between the

[26] For a critique see Grosz, *Becoming Undone: Darwinian Reflections on Life, Politics, and Art* (Durham, NC: Duke University Press, 2011), 115-17.
[27] Merle Patchett, 'Fashioning Feathers', *Fashioning Feathers: Dead Birds, Millinery Crafts and the Plumage Trade*, online exhibition <http://fashioningfeathers.com/fashioning-feathers/> accessed 23 July 2015.
[28] I have adopted this subtitle from the postgraduate conference 'Museum Metamorphosis: The Adaptable and Changing Museum', School of Museum Studies, University of Leicester (5-6 Nov. 2013), at which I presented my research on the shifting ideologies of the Natural History Museum architecture and Index Museum.

museum's architectural container and its contents, objects on display. In this respect, the metaphor of the museum as a living being, as mobilised by Owen's vision of the Natural History Museum's anatomy and familiar in such architectural terminology as 'circulation' and 'arteries',[29] may be useful for conceptualising this continuum – both to imbue the space with a sense of animacy and to conceive of objects and displays as integral to the larger morphology.

Admittedly, a bodily metaphor risks further humanising the non-human in a field that desperately needs to move away from anthropocentrism – Altmejd's giant as geological formation/display architecture foretells a cautionary tale here – or at least biologising the inanimate in a field that undermines the non-animal. And yet, in the context of the natural history museum, perhaps an organic – not necessarily human – analogy can be constructive. Rather than an autonomous organism comprising discrete organs/displays, the museum can be understood as a body without organs, 'permeated by unformed, unstable matters, by flows in all directions, by free intensities or nomadic singularities, by mad or transitory particles'.[30] This is how Deleuze and Guattari describe the Earth, which ultimately eludes systems of classification, becoming deterritorialised and destratified. Of course museums ostensibly epitomise the classificatory impulse of modernism, as has been examined at length in this thesis, but as I have demonstrated, objects on display are also constantly eluding systems of classification. An organic concept of becoming opens up an alternative understanding of this defining space of modernism to the Foucauldian heterotopia and its basis in mirroring, as to the Foucauldian notion of natural history as a discursive formation, rooted in the 'nomination of the visible'.[31]

As such, things – natural and humanmade, in and out of the museum, historically and in the present and future – require rethinking. In *Vibrant Matter* philosopher Jane Bennett locates 'public value in following the scent of a nonhuman, thingly power, the material agency of natural bodies and technological

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[29] Adrian Forty argues that the separation of science from architecture by the late nineteenth century brought about the perceived need for such anatomical analogies. Forty, '"Spatial Mechanics": Scientific Metaphors in Architecture', in Peter Galison and Emily Thompson, eds, *The Architecture of Science* (Cambridge: MIT Press, 1999), 213-32.
[30] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (1980), trans. Brian Massumi (London: Continuum, 2004), 45.
[31] Michel Foucault, 'Of Other Spaces' (1967), trans. Jay Miskowiec, *Diacritics* 16 (spring 1986), 25; Foucault, *The Order of Things: An Archaeology of the Human Sciences* (1966) (London: Routledge, 1989), 144.

artifacts'.[32] Historical analysis of 'the extent to which human being and thinghood overlap, the extent to which the us and the it slip-slide into each other' is essential for addressing the chimeras of the Natural History Museum and continuing disempowering assumptions surrounding them, as objective, natural, illustrative or stand-ins and representations.[33] By challenging the integrity of objects, and therefore of humans, it becomes possible to break down the ontological hierarchy that stands between them, as a sort of final frontier for other hierarchies including that of gender. As a special issue of *Transgender Studies Quarterly* on 'Tranimalities' suggests, '[T]he human/nonhuman distinction is inextricably tied to questions of gender and sexual difference.'[34]

An understanding of objects as 'actants', to use Bruno Latour's term as adopted by Jane Bennett,[35] within the assemblage of the museum then is necessary to considering the museum as an integrated and transforming entity. Here, I believe, lies the potential for relevant gender analysis of the museum providing a non-anthropocentric alternative to critiques developed over the past few decades. For example, I have wondered how might Carol Duncan's concept of the museum as a ritual structure instilling a linear trajectory towards abstraction in modern art – with images of naked female bodies forming integral stops along the way – bear on natural history museums?[36] While I have considered Tony Bennett's biopolitical critique of museums' similarly performative evolutionary regimes as a counterpart, as well as more nuanced analyses of audiences' experiences of collections, the humanistic focus of all of these studies means they stop short of considering the potential for 'nonnormative subject formations' enabled by queer animality and the non/human.[37] Alternatively, Sara Ahmed's concept of queer phenomenology, rooted in both sexual and spatial orientations – and, importantly, attentive to the potential for disorientation – might open new avenues for analysing the museum encounter, since as Ahmed writes, 'spaces are not exterior to bodies; instead, spaces are like a second skin that unfolds in the folds of the

[32] Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham, North Carolina: Duke University Press, 2010), viii.
[33] Jane Bennett, 4.
[34] Susan Stryker and Paisley Currah, 'General Editors' Introduction', *TSQ: Transgender Studies Quarterly*, special issue: Tranimalities, ed. Eva Hayward and Jami Weinstein, 2.2 (May 2015), 189.
[35] Jane Bennett, 4.
[36] Carol Duncan, *Civilizing Rituals: Inside Public Art Museums* (London: Routledge, 1995), 111-23.
[37] Mel Y. Chin, *Animacies: Biopolitics, Racial Mattering, and Queer Affect* (Durham, NC: Duke University Press, 2012), 7. Also see Noreen Giffney and Myra J. Hird, eds, *Queering the Non/Human* (Aldershot, UK: Ashgate, 2008).

body'.[38] To examine queer orientations beyond the human body, Rosi Braidotti's theory of nomadic affectivity explicitly mobilises multiplicity including non-human otherness in a materialist alternative to linguistic mediation, thus providing further possibilities for unravelling the aura and affect that reside in natural history objects as in art objects.[39]

The potentiality of such non/human orientations in relation to 'representations' of 'nature' is especially timely as scientists debate the human impact on the Earth and its atmosphere, some arguing that this constitutes a distinct geological epoch.[40] With the reinvigoration of the Index Museum, the Natural History Museum is clearly responding – at least optically – to current concern over the Anthropocene. And yet like the formidable blue whale skeleton, does this metanarrative not risk overshadowing minoritised, possibly feminised versions of nature?[41] With the discourse around the anthropocene, or 'manthropocene',[42] dominated by white Western male scientists comes a devastating exclusion of interdisciplinarity and plurality, notably regarding other species. Donna Haraway states: 'No species, not even our own arrogant one pretending to be good individuals in so-called modern Western scripts, acts alone; assemblages of organic species and of abiotic actors make history, the evolutionary kind and the other kinds too.'[43] With its expansive two-year *Anthropocene Project*, Haus der Kulturen der Welt, Berlin, has taken important steps to responding to the demand for interface between cultural and scientific analysis that is core to the very concept.[44] However, it is fundamental that such institutions – like the Natural History Museum – make themselves transparent by

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[38] Sara Ahmed, *Queer Phenomenology: Orientations, Objects, Others* (Durham, NC: Duke University Press, 2006), 9.
[39] Rosi Braidotti, 'Affirming the Affirmative: On Nomadic Affectivity', *Rhizomes* 11/12 (autumn 2005/spring 2006) <http://www.rhizomes.net/issue11/braidotti.html#_ftn1> accessed 9 July 2015.
[40] Ian Sample, 'Anthropocene: is this the new epoch of humans?' *The Guardian website* <http://www.theguardian.com/science/2014/oct/16/-sp-scientists-gather-talks-rename-human-age-anthropocene-holocene> accessed 9 July 2015.
[41] See 'Anthropocene Feminism' conference, Center for 21st Century Studies, University of Minnesota (10-12 Apr. 2014) <http://c21uwm.com/anthropocene/> accessed 9 July 2015.
[42] Kate Raworth, 'Must the Anthropocene be a Manthropocene?' *The Guardian website* <http://www.theguardian.com/commentisfree/2014/oct/20/anthropocene-working-group-science-gender-bias> accessed 9 July 2015.
[43] Donna Haraway, 'Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin', *Environmental Humanities* 6 (2015), 159.
[44] I am grateful to have been able to take part in the curatorial workshop 'On Research III', *Anthropocene Project*, HKW (18-19 Oct. 2014). See 'The Anthropocene Project', *Haus der Kulturen der Welt website* <http://www.hkw.de/en/programm/projekte/2014/anthropozaen/anthropozaen_2013_2014.php> accessed 9 July 2015.

reflecting on the role of display practices as more than re-presentation of the problems at hand.

'The Natural History Museum has the breadth, authority, experience and public impact to reinvent the role of natural history museums in the twenty-first century,' claims the institution's 'Strategy to 2020'.[45] It may be implausible that museums might undertake critical analysis of gender and species hierarchy in ecological concepts such as Anthropocene: but by incorporating inward-looking critique into programming, institutions such as the Natural History Museum would make strides toward self-examination of parallel issues within their own histories. In keeping with the anatomical metaphor, in 1889 W.H. Flower claimed, 'A museum is like a living organism – it requires continual and tender care. It must grow, or it will perish.'[46] This sentiment remains relevant to natural history museums today. While at its broadest metamorphosis can simply mean change, when conceptualising the museum as an entity that must transmorph – rather than simply 'grow' – it becomes a pointed metaphor. A radical mutation that sheds the skin of its former hegemonic and didactic function with its reliance on a reflective logic of representation is required to ensure not only the museum's relevance, but also its survival.

[45] Natural History Museum, 'Strategy', 11.
[46] William Henry Flower, 'Museum Organisation': Presidential Address to the British Association for the Advancement of Science, Newcastle-on-Tyne (11 Sept. 1889), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 13.

Archival Sources

'The Ancestry of Birds', *Daily Chronicle* (19 May 1893), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'Birds in Their Homes', *Daily Telegraph* (29 Jan. 1884), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Blaschka, Leopold. *Blaschka Catalogue* (c. 1870), enclosed in Leopold Blaschka, letter to Albert Günther (11 Nov. 1875), NHM Archives.

'British Birds at Cromwell Road', *Morning Post* (26 May 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Daily Telegraph (13 Apr.1887), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Goss., H. Honourary Secretary of the Entomological Society of London, letter to the Trustees of the British Museum (24 Nov. 1888), A. Günther Collection 29. Memoranda Relating to New Museum, Directorship, Staff 1868-84. *Folder 2. Official minutes and correspondence on staff matters 1867-1894*, NHM Archives.

Günther, Albert. Letter, Zoological Department (9 Oct. 1888), A. Günther Collection 29. Memoranda Relating to New Museum, Directorship, Staff 1868-84. *Folder 2. Official minutes and correspondence on staff matters 1867-1894*, NHM Archives.

——. *Report by the Keeper of Zoology, British Museum (Natural History)*, 21 July 1880), 5, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

Hansard, 'Debate of July 22, 1861', Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'How I Sketched Mrs Siddons's Shoes', *Pall Mall Gazette* (11 Jan. 1889), clipped in Ellen Terry's *Macbeth* notebook, Smallhythe Place Archives.

'The National Collections of Natural History', *The Times* (18 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'The National Collections of Natural History', *The Times* (6 Aug. 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'Natural History Museum'. *Daily Chronicle* (28 December 1885), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'The New Museum of Natural History', *Nature* (21 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'The New Natural History Museum', *Nature* (16 Nov. 1882), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'The New Natural History Museum', source unknown (16 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

'Owen memorial reports' (21 Jan. 1893 and 3 June 1897), Owen Collection 38, NHM Archives.

Owen, Richard. 'Address to the Biological Section of the British Association', York (1881), 10, Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

——. *Index Museum. Report by the Superintendant of Natural History, British Museum (Natural History* (19 July 1880), 3, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

——. *Index Museum. Report by the Superintendant of Natural History on the Several Reports of the Keepers of Natural History, British Museum (Natural History)* (28 July 1880), 1-2, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

——. 'Owen's MSS' (1879), 220, in W.G. Ridewood, *Notes on the history of the Index Museum, 1880-1917* (1917), Index Museum, DF938/22-32, NHM Archives.

——. 'Owen's MSS of Guide for Index or Type Museum', 265, in W.G. Ridewood, *Notes on the history of the Index Museum, 1880-1917* (1917), Index Museum, DF938/22-32, NHM Archives.

——. 'Report to the Commission of the Advancement of Science' (1874), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Ruskin, John. Letter to Lazarus Fletcher, (Brantwood, 1884), U DP/8/14, Hull History Centre Archives.

——. Letter to Lazarus Fletcher, (Brantwood, 30 Mar. 1884), U DP/8/23, Hull History Centre Archives.

——. Letter to Lazarus Fletcher (Coniston, 3 Aug. 1884), U DP/8/34, Hull History Centre Archives.

——. Letter to Lazarus Fletcher (Coniston, 20 Mar. 1884), U DP/8/24, Hull History Centre Archives.

——. Letter to Lazarus Fletcher (Laon, 14 Aug. 1882), U DP/8/6, Hull History Centre Archives.

——. Letter to Lazarus Fletcher (Mar. 1884), U DP/8/22, Hull History Centre Archives.

——. Letter to Lazarus Fletcher (probably Mar. 1884), U DP/8/27, Hull History Centre Archives.

——. Letter to Lazarus Fletcher (Sandgate, 14 Dec. 1887), U DP/8/44, Hull History Centre Archives.

Seeley, Harry Govier. Letter to John Ruskin (Sevenoaks, 3 Apr. 1885), U DP/7/47, Hull History Centre Archives.

'Saturday Afternoons VIII: At the Natural History Museum, Cromwell-Road', *Pall Mall Gazette* (22 Feb. 1890), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

The Saturday Review (23 Apr. 1881), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Terry, Ellen. Personal copy of *Macbeth: A Tragedy by William Shakespeare, as Arranged for the Stage by Henry Irving* (with inscriptions), Smallhythe Place Archives.

The Times (18 Apr. 1881) Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Tinker, Zenzie. 'Condition assessment and estimate for re-conservation: Lady Macbeth costume worn by Ellen Terry c. 1888', textile conservation, National Trust (July/Aug. 2007).

Tyndale, Agatha. Letter to John Ruskin (Winnington Hall, Northwich 18 Dec. 1877), U DP/7/2, Hull History Centre Archives.

'With the Birds', *Daily News* (30 May 1887), Newspaper Cuttings, vol. 1 (1879-1902), NHM Archives.

Woodward, Henry. *Report by the Keeper of Geology*, *British Museum (Natural History)* (21 July 1880), 7, *Folder 11: Printed papers on the Index Museum and the new museum, 1880-1881,* A. Günther Collection 29: Memoranda Relating to New Museum, Directorship, Staff 1868-84, NHM Archives.

Books, Articles and Theses

Ackland, Henry W. and John Ruskin. *The Oxford Museum* (London: Smith, Elder and Co, 1859).

Adams, Carol J. and Josephine Donovan, eds. *Animals and Women: Feminist Theoretical Explorations* (Durham, NC: Duke University Press, 1995).

Adburgham, Alison. *Shops and Shopping 1800-1914* (1964), 3rd edn (London: Larrie and Jenkins, 1989).

Ahmed, Sara. *Queer Phenomenology: Orientations, Objects, Others* (Durham, NC: Duke University Press, 2006).

Alaya, Flavia. 'Victorian Science and the "Genius" of Woman', *Journal of the History of Ideas* 38 (1977), 261-80.

Alberti, Samuel. 'The Museum Affect: Visiting Collections of Anatomy and Natural History', in Aileen Fyfe and Bernard Lightman, eds, *Science in the Marketplace: Nineteenth-Century Sites and Experiences* (Chicago: University of Chicago Press, 2007), 371-403.

——. 'Owning and Collecting Objects in Nineteenth-Century Britain', in Marco Beretta, ed., *From Private to Public: Natural Collections and Museums* (Sagamore Beach, MA: Science History Publications, 2005), 559-71.

Alexander, Victoria N. 'Nabokov, Teleology and Insect Mimicry', *Nabokov Studies* 7 (2002), 177–213.

Allen, Grant. 'Woman's Intuition', *The Forum* 9 (1890), 333-40.

Appel, Toby A. *The Cuvier-Geoffrey Debate: French Biology in the Decades Before Darwin* (Oxford: Oxford University Press, 1987).

Argyll, Duke of, George Douglas Campbell. *The Reign of Law* (London: A. Strahan, 1867).

Armstrong, Isobel. *Victorian Glassworlds: Glass Culture and the Imagination, 1830-1880* (Oxford: Oxford University Press, 2008).

Arscott, Caroline. *William Morris and Edward Burne-Jones: Interlacings* (New Haven: Yale University Press, 2008).

——. 'William Morris's Tapestry: Metamorphosis and Prophecy in *The Woodpecker'*, *Art History,* special issue: The Clever Object, ed. Matthew C. Hunter and Francesco Lucchini, 36.3 (June 2013), 608-25.

Asma, Stephen T. *Stuffed Animals and Pickled Heads: The Culture and Evolution of Natural History Museums* (Oxford: Oxford University Press, 2001).

Auerbach, Nina. *Private Theatricals: The Lives of the Victorians* (Cambridge, MA: Harvard University Press, 1990).

Bal, Mieke. 'Telling, Showing, Showing Off', in *Double Exposures: The Subject of Cultural Analysis* (New York: Routledge, 1996), 13-56.

Balfour, Ian. *Famous Diamonds* (London: Collins, 1987).

Barad, Karen. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007).

——. 'Nature's Queer Performativity', *Kvinder, Køn og forskning/ Women, Gender and Research* 1-2 (2012), 25-53.

Barber, Lynn. *The Heyday of Natural History, 1820-70* (London: Jonathan Cape, 1980).

Barlow, Paul. *Time Present and Time Past: The Art of John Everett Millais* (London: Biddles Ltd., King's Lynn, 2005).

Batchelor, David. *Chromophobia* (London: Reaktion, 2000).

Bates, Henry Walter. *The Naturalist on the River Amazons*, 2 vols (London: John Murray, 1863).

Baudelaire, Charles. 'The Painter of Modern Life' (1863), in *The Painter of Modern Life and Other Essays*, trans. and ed. Jonathan Mayne, new edn (New York: Phaidon, 1995), 1-45.

Beer, Gillian. *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction* (1983), 2nd edn (Cambridge: Cambridge University Press, 2000).

——. '"The Face of Nature": Anthropomorphic Elements in the Language of *The Origin of Species*', in Ludmilla Jordanova, ed., *Languages of Nature: Critical Essays on Science and Literature*, (London: Free Association, 1986), 212-43.

——. 'Introduction', in Charles Darwin, *On the Origin of Species* (1859) (Oxford: Oxford University Press, 2009), vii-xxv.

Beerbohm, Max. 'Dandies and Dandies', *The Works of Max Beerbohm* (London: John Lane, 1896), 2-11.

Bell, Ingress. 'The New Natural History Museum', *The Magazine of Art* 4 (1881), 360.

Benjamin, Walter. 'On the Mimetic Faculty' (1933), in *Reflections: Essays, Aphorisms, Political Writings*, ed. Peter Demetz, trans. Edmund F.N. Jephcott (New York: Schocken, 1989), 333-36.

——. *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin, ed. Rolf Tiedemann (Cambridge, MA: Belknap Press, 1999).

Bennett, Jane. *Vibrant Matter: A Political Ecology of Things* (Durham, North Carolina: Duke University Press, 2010).

Bennett, Tony. *The Birth of the Museum: History, Theory, Politics* (London: Routledge, 1995).

——. *Pasts Beyond Memory: Evolution, Museums, Colonialism* (London: Routledge, 2004).

Bernstein, Susan. 'Designs After Nature: Evolutionary Fashions, Animals, and Gender', in Deborah Denenholz Morse and Martin Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 65-79.

Biology and Gender Study Group, 'The Importance of Feminist Critique for Contemporary Cell Biology', *Hypatia* 3.1 (spring 1988), 61-76.

Birke, Lynda. *Feminism, Animals and Science: The Naming of the Shrew* (Buckingham, PA: Open University Press, 1994).

Blaisdell, M. 'Natural Theology and Nature's Disguises', *Journal of the History of Biology* 15.2 (1982), 163-89.

Blanc, Charles. *The Grammar of Painting and Engraving* (1867), trans. Kate Newell Doggett (New York: Hurd and Houghton, 1874).

Blum, Stella. 'Fashions in Godey's Lady's Book, 1837-69', in Blum, ed., *Fashions and Costumes from Godey's Lady's Book* (New York: Dover, 1985) n.p.

Bond, Bryony and Fiona Boundy, eds. *Goshka Macuga: Sleep of Ulro* (Rotterdam: Veenman, 2008).

Bowdler Sharpe, Richard. 'Ornithology at South Kensington', *The English Illustrated Magazine* 51 (Dec. 1887), 165-75.

Bowdler Sharpe, Richard with Albert Günther. *A Guide to the Gould Collection of Humming-Birds in the British Museum* (London: British Museum (Natural History), 1881).

Braidotti, Rosi. 'Affirming the Affirmative: On Nomadic Affectivity', *Rhizomes* 11/12 (autumn 2005/spring 2006) <http://www.rhizomes.net/issue11/braidotti.html#_ftn1>

——. *Metamorphoses: Towards a Materialist Theory of Becoming* (Cambridge: Polity Press, 2002).

Brain, Robert Michael. 'Protoplasmania: Huxley, Haeckel, and the Vibratory Organism in Late Nineteenth-Century Science and Art', in Barbara Larson

and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 92-123.

Bredekamp, Horst. *Darwins Korallen: Frühe Evolutionsmodelle und die Tradition der Naturgeschichte* (Berlin: Wagenbach Verlag, 2005).

——. *The Lure of Antiquity and the Cult of the Machine: The Kunstkammer and the Evolution of Nature, Art, and Technology*, trans. Allison Brown (Princeton, NJ: Markus Wiener, 1995).

Breidbach, Olaf. *Visions of Nature: The Art and Science of Ernst Haeckel* (Munich: Prestel, 2006).

Breward, Christopher. 'Aestheticism in the Marketplace: Fashion, Lifestyle and Popular Taste', in Stephen Calloway and Lynn Federle Orr, eds, *The Cult of Beauty: The Aesthetic Movement 1860-1900*, exh. cat. (London: V&A, 2011), 192-204.

——. *The Hidden Consumer: Masculinities, Fashion and City Life 1860-1914* (Manchester: Manchester University Press, 1999).

British Museum (Natural History). *Guide to the Exhibited Series of Insects* (London: British Museum (Natural History), 1908).

——. *Nature Stored, Nature Studied: Collections, Conservation and Allied Research at the Natural History Museum* (London: British Museum (Natural History), 1981).

——. *Guide to the Coral Gallery (Protozoa, Porifera or Sponges, Hydrozoa and Anthozoa in the Department of Zoology British Museum (Natural History)* (London: Trustees of the British Museum (Natural History), 1902).

Brown, Bill. 'Thing Theory', *Critical Inquiry* 28.1 (autumn 2001), 1-22.

Browne, Janet. 'Do Collections Make the Collector? Charles Darwin in Context', in Marco Beretta, ed., *From Private to Public: Natural Collections and Museums* (Sagamore Beach, MA: Science History Publications, 2005), 171-78.

Brownell, Robert. *Marriage of Inconvenience* (London: Pallas Athene, 2013).

Brunner, Bernd. *The Ocean at Home: An Illustrated History of the Aquarium* (New York: Princeton, 2003).

Buckland, Adelene. *Novel Science: Fiction and the Geological Imagination* (Chicago: University of Chicago Press, 2011).

Buckland, William. *Geology and Mineralogy: Considered with Reference to Natural Theology*, vol. 1 (1836), ed. David Knight (London: Routledge, 2003).

Bullen, J.B. 'Alfred Waterhouse's Romanesque "Temple of Nature": The Natural History Museum, London', *Architectural History* 49 (2006), 257-85.

Burton, Anthony. *Vision and Accident: The Story of the Victoria and Albert Museum* (London: V&A, 1999).

Bury, Shirley. *Jewellery, 1789-1910: The International Era*, vol. 1 (London: Victoria and Albert Museum, 1986).

Butler, Judith. *Bodies That Matter: On the Discursive Limits of 'Sex'* (1993), new edn (London: Routledge, 2011).

Caillois, Roger. 'Mimicry and Legendary Psychasthenia' (1935), trans. John Shepley, *October* 31 (winter 1984), 16-32.

Candlin, Fiona. *Art, Museums and Touch* (Manchester: Manchester University Press, 2010).

Candlin, Fiona and Raiford Guins, eds. *The Object Reader* (London: Routledge, 2009).

Carlyle, Thomas. 'Biography', *Fraser's Magazine* 27 (Apr. 1832), in *The Works of Thomas Carlyle*, vol. 2 (Cambridge: Cambridge University Press, 1899), 44-61.

Carpenter, G.D. Hale and E.B. Ford. *Mimicry* (London: Methuen, 1933).

Chamberlain, Stephanie. 'Fantasizing Infanticide: Lady Macbeth and the Murdering Mother in Early Modern England', *College Literature* 32.2 (2005), 72–91.

Cheng, Joyce. 'Mask, Mimicry, Metamorphosis: Roger Caillois, Walter Benjamin and Surrealism in the 1930s', *Modernism/Modernity* 16.1 (Jan. 2009), 61-86.

Chin, Mel Y. *Animacies: Biopolitics, Racial Mattering, and Queer Affect* (Durham, NC: Duke University Press, 2012).

Clark, John F.M. *Bugs and the Victorians* (New Haven: Yale University Press, 2009).

Cohen, Deborah. *Household Gods: The British and Their Possessions* (New Haven: Yale University Press, 2006).

Comyns Carr, Joseph. *Macbeth and Lady Macbeth: An Essay* (London: Bickers and Son, 1889).

Conway, J. 'Stereotypes of Femininity in a Theory of Sexual Evolution', in M. Vicinus, ed., *Suffer and Be Still: Women in the Victorian Age* (Bloomington: Indiana University Press, 1973), 140-54.

Coombes, Annie E. *Reinventing Africa: Museums, Material Culture and Popular Imagination in Late Victorian and Edwardian England* (New Haven: Yale University Press, 1994).

Corbin, Alain. *The Lure of the Sea: The Discovery of the Seaside in the Western World 1750-1840*, trans. Jocelyn Phelps (Cambridge: Cambridge University Press, 1994).

Crary, Jonathan. *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*, new edn (Cambridge, MA: MIT Press, 1992).

Cronin, Helena. *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991).

Cunnington, C. Willett. *Feminine Attitudes in The Nineteenth Century* (London: William Heinemann, 1935).

Darwin, Charles. *The Descent of Man and Selection in Relation to Sex* (1871) (London: Penguin, 2004).

——. *Living Cirripedia, A monograph on the sub-class Cirripedia, with figures of all the species. The Lepadidæ; or, pedunculated cirripedes*, vols 1-2 (London: Ray Society, 1851-1854).

——. *On the Origin of Species* (1859), ed. Gillian Beer (Oxford: Oxford University Press, 2008).

——. *On the Origin of Species* (1859), ed. Jim Endersby (Cambridge: Cambridge University Press, 2009).

Daston, Lorraine. 'The Glass Flowers', in Daston, ed., *Things That Talk: Object Lessons from Art and Science* (New York: Zone Books, 2004), 223-56.

——, ed. *Things That Talk: Object Lessons from Art and Science* (New York: Zone Books, 2004).

——. 'Type Specimens and Scientific Memory', *Critical Inquiry* 31 (autumn 2004), 153-82.

Daston, Lorraine and Greg Mittman, eds. *Thinking with Animals: New Perspectives on Anthropomorphism* (New York: Columbia, 2006).

Daston, Lorraine and Katharine Park. *Wonders and the Order of Nature, 1150-1750* (New York: Zone Books, 1998).

Daston, Lorraine and Peter Galison. *Objectivity* (New York: Zone Books, 2007).

Davis, Noela. 'New Materialism and Feminism's Anti-Biologism: A Response to Sara Ahmed', *European Journal of Women's Studies* 16 (Feb. 2009), 67-80.

De Chadarevian, Soraya and Nick Hopwood, eds. *Models: The Third Dimension of Science* (Stanford, CA: Stanford University Press).

Deleuze, Gilles and Félix Guattari. *Anti-Oedipus: Capitalism and Schizophrenia* (1972), trans. Brian Massumi (London: Continuum, 2004).

——. *A Thousand Plateaus: Capitalism and Schizophrenia* (1980), trans. Brian Massumi (London: Continuum, 2004).

Déry, Louise. *David Altmejd: The Index (Montreal:* Galérie de l'UQAM, 2007).

Di Gregorio, Mario A. *From Here to Eternity: Ernst Haeckel and Scientific Faith* (Gottingen: Vandenhoeck & Ruprecht, 2005).

Dickens, Charles. 'The Tresses of the Day Star', *Household Words* 3.65 (1851), 289-91.

Dijkstra, Bram. *Idols of Perversity: Fantasies of Feminine Evil in Fin-de-siècle Culture* (New York: Oxford University Press, 1986).

Dodgson, Stuart. *The Life and Letters of Lewis Carroll* (London: T. Fisher Unwin, 1898).

Donald, Diana and Jane Munro, eds. *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (New Haven: Yale University Press, 2009).

Doughty, Robin W. *Feather Fashions and Bird Preservation: A Study in Nature Protection* (Berkeley: University of California Press, 1975).

Douglas, Mary. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* (1966) (London: Routledge, 2002).

Drahotová, Olga et al. *Bohemian Glass* (Prague: Museum of Decorative Arts, 1992).

Dudley, Sandra H., ed. *Museum Materialities: Objects, Engagements, Interpretations* (London: Routledge, 2010).

Duncan, Carol. *Civilizing Rituals: Inside Public Art Museums* (London: Routledge, 1995).

Durgan, Jessica. 'Color, the Visual Arts, and Representations of Otherness in the Victorian Novel', PhD diss. (Texas A&M University, 2012).

Durin, Bernhard, Gerhard Scherer and Paul Armand Gette. *Insects, Etc.: An Anthology of Arthropods Featuring a Bounty of Beetles* (New York: Hudson Hills Press, 1981).

Dyer, Ruthanna. 'Learning Through Glass: The Blaschka Marine Models in North American Post Secondary Education', *Historical Biology* 20.1 (2008), 29-37.

Eastlake, Elizabeth. 'Compilation of select documents' (1835-1858), in Jonah Siegel, ed., *The Emergence of the Modern Museum: An Anthology of Nineteenth-Century Sources* (Oxford: Oxford University Press, 2008), 220-25.

Ettinger, Bracha Lichtenberg. 'Matrix and Metramorphosis', *Differences*, special issue: Trouble in the Archives, ed. Griselda Pollock, 4.3 (1992), 176-208.

Endt, Marion. *Reopening the Cabinet of Curiosities: Nature and the Marvellous in Surrealism and Contemporary Art*, Ph.D. thes. (University of Manchester, 2008).

Farber, Paul Lawrence. 'The Development of Taxidermy and the History of Ornithology', *Isis* 68.4 (1977), 550-66.

'Female Animals Portrayed as "Femmes Fatales" by Researchers', *University of St Andrews website: News* (28 Feb. 2013) <https://www.st-andrews.ac.uk/news/archive/2013/title,214845,en.php>

Fillin-Yeh, Susan. 'Introduction: New Strategies for a Theory of Dandies', in Fillin-Yeh ed., *Dandies: Fashion and Finesse in Art and Culture* (New York: NYU Press, 2001), 1-34.

Fletcher, Lazarus. *A Guide to the Mineral Gallery of the British Museum (Natural History) with an Introduction to the Study of Minerals* (London: British Museum (Natural History), 1884).

——. *An Introduction to the Study of Meteorites* (London: British Museum (Natural History), 1881).

Flint, Kate. *The Victorians and the Visual Imagination* (Cambridge: Cambridge University Press, 2000).

Flower, William Henry. 'Address at the Opening of the Booth Museum at Brighton' (1890), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 70-99.

——. *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1886).

——. *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1889).

——. 'Modern Museums': Presidential Address to the Museums Association, London, (3 July 1893), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 30-53.

——. 'Museum Organisation': Presidential Address to the British Association for the Advancement of Science, Newcastle-on-Tyne (11 Sept. 1889), in *Essays on Museums and Other Subjects Connected with Natural History* (London: MacMillan and Co., 1898), 1-29.

Flower, W.H. with E. Ray Lankester. *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1901).

——. *A General Guide to the British Museum (Natural History)* (London: British Museum (Natural History), 1906).

Forgan, Sophie. 'Bricks and Bones: Architecture and Science in Victorian Britain', in Peter Galison and Emily Thompson, eds, *The Architecture of Science* (Cambridge: MIT Press, 1999), 181-212.

Fortey, Richard A. *Dry Store Room No. 1: The Secret Life of the Natural History Museum* (London: Harper Press, 2008).

Forty, Adrian. '"Spatial Mechanics": Scientific Metaphors in Architecture', in Peter Galison and Emily Thompson, eds, *The Architecture of Science* (Cambridge: MIT Press, 1999), 213-32.

Foucault, Michel. *The History of Sexuality: Volume 1: An Introduction* (1978), trans. Robert Hurley (New York: Vintage, 1990).

——. 'Of Other Spaces' (1967), trans. Jay Miskowiec, *Diacritics* 16 (spring 1986), 22-27.

——. *The Order of Things: An Archaeology of the Human Sciences* (1966) (London: Routledge, 1989).

Foutch, Ellery. 'Arresting Beauty: The Perfectionist Impulse of Peale's Butterflies, Heade's Hummingbirds, Blaschka's Flowers, and Sandow's Body', Ph.D. diss. (University of Pennsylvania, 2011).

Frankel, Nicholas. 'The Ecstasy of Decoration: *The Grammar of Ornament* as Embodied Experience', *Nineteenth-Century Art Worldwide*, 2.1 (Winter 2003), <http://www.19thc-artworldwide.org/index.php/winter03/246-the-ecstasy-of-decoration-the-grammar-of-ornament-as-embodied-experience>

Gamwell, Lynn. *Exploring the Invisible: Art, Science, and the Spiritual* (Princeton, NJ: Princeton University Press, 2002).

Garb, Tamar. *The Body in Time: Figures of Femininity in Late Nineteenth-Century France* (Seattle: University of Washington Press, 2008).

——. *The Painted Face: Portraits of Women in France 1814-1914* (New Haven: Yale University Press, 2007).

Gates, Barbara T. *Kindred Nature: Victorian and Edwardian Women Embrace the Living World* (Chicago: University of Chicago Press, 1998).

Gates, Barbara T. and Ann B. Shteir. *Natural Eloquence: Women Reinscribe Science* (Madison: University of Wisconsin Press, 1997).

Geddes, Patrick. 'The Index Museum: Chapters from an Unpublished Manuscript' (c. 1902), *Assemblage* 10 (Dec. 1989), 65-69.

Geddes, Patrick and J. Arthur Thomson. *The Evolution of Sex* (London: Walter Scott, 1889).

Gere, Charlotte and Judy Rudoe. *Jewellery in the Age of Queen Victoria* (London: British Museum, 2010).

Giffney, Noreen and Myra J. Hird, eds. *Queering the Non/Human* (Aldershot, UK: Ashgate, 2008).

Girouard, Mark. *Alfred Waterhouse and the Natural History Museum* (London: Natural History Museum, 1999).

Gosse, Philip Henry. *The Aquarium: An Unveiling of the Wonders of the Deep Sea* (London: Van Voorst, 1854).

——. *Life In Its Lower, Intermediate, and Higher Forms: Or, Manifestations of the Divine Wisdom in the Natural History of Animals* (London: Van Voorst, 1857).

——. *A Naturalist's Rambles on the Devonshire Coast* (London: Van Voorst, 1853).

Gough, Zoe. 'Hungry Mantises are Nature's Femmes Fatales', *BBC Earth: Nature's Wonders* <http://www.bbc.com/earth/story/20141217-hungry-mantises-are-most-attractive>

Gould, John. *An Introduction to the Trochilidae, or Family of Humming-Birds* (London: Taylor and Francis, 1861).

Gould, Stephen Jay. *Ontogeny and Phylogeny* (Cambridge, MA: Harvard University Press, 1977).

Gray, Asa. 'Natural Selection Not Inconsistent with Natural Theology' (1860), in *Darwiniana* (Cambridge, MA: Harvard University Press, 1963), 72-145.

Greenblatt, Stephen. 'Resonance and Wonder', in Ivan Karp and Steven D. Lavine, eds, *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington, DC: Smithsonian, 1991), 42-56.

Greenhalgh, Paul, ed. *Art Nouveau 1890-1914*, exh. cat. (London: V&A, 2000).

——. 'The Cult of Nature', in Greenhalgh, ed., *Art Nouveau 1890-1914*, exh. cat. (London: V&A, 2000), 54-71.

Grosz, Elizabeth. 'Animal Sex: Libido as Desire and Death', in *Grosz* and Elspeth Probyn, eds, *Sexy Bodies: The Strange Carnalities of Feminism* (London: Routledge, 1995), 278-300.

——. *Becoming Undone: Darwinian Reflections on Life, Politics, and Art* (Durham, NC: Duke University Press, 2011).

——. *Chaos, Territory, Art: Deleuze and the Framing of the Earth* (New York: Columbia University Press, 2008).

——. *Time Travels: Feminism, Nature, Power* (Durham, NC: Duke University Press, 2005).

Günther, A.E. *The Founders of Science at the British Museum 1753-1900* (Halesworth, UK: Halesworth Press, 1980).

Günther, Albert. *Guide to the Shell and Starfish Galleries (Mollusca, Echinodermata, Vermes) in the Department of Zoology of the British Museum (Natural History)* (London: Trustees of the British Museum (Natural History), 1887).

——. *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 2: *Separate Historical Accounts of the Several Collections Included in the Department of Zoology* (London: British Museum (Natural History), 1906).

Haeckel, Ernst. 'Crystal Souls' (1917), *Forma*, special issue, 14.1-2 (1999), 1-204.

——. *The Natural History of Creation: Or the Development of the Earth and Its Inhabitants by the Action of Natural Causes*, vol. 1, trans. E . Ray Lankester (London: King, 1876).

——. *Report on the scientific results of the voyage of H.M.S. Challenger during the years 1873-76 under the command of Captain George S. Nares and the late Captain Frank Tourle Thomson, Zoology: Report on the Siphonophorae*, vol. 28.

Haraway, Donna. 'Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin', *Environmental Humanities* 6 (2015), 159-65.

——. 'A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century', in *Simians, Cyborgs and Women: The Reinvention of Nature* (London: Free Association, 1991), 149-81.

——. 'A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies', *Configurations* 2.1 (1994), 59-71.

——. 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in *Simians, Cyborgs, and Women: The Reinvention of Nature* (London: Free Association, 1991), 183-202.

——. 'Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936', *Social Text* 11 (winter 1984-85), 20-64.

Harris, W.C. and Dawn Vernooy, '"Orgies of Nameless Horrors": Gender, Orientalism, and the Queering of Violence in Richard Marsh's The Beetle', *Papers on Language and Literature* 43.3 (autumn 2012), 339-81.

Haweis, Mrs H.R. *The Art of Dress* (London: Chatto and Windus, 1879).

Heringman, Noah. *Romantic Rocks, Aesthetic Geology* (Ithaca: Cornell University Press, 2004).

Heyck, Thomas William. *The Transformation of Intellectual Life in Victorian England* (New York: St Martin's Press, 1982).

Hilton, Tim. *Ruskin: The Early Years*, new edn (New Haven: Yale University Press, 2000).

Hird, Myra J. 'Animal Trans', in Noreen Giffney and Hird, eds, *Queering the Non/Human* (Aldershot, UK: Ashgate, 2008), 227-48.

Historical Biology: An International Journal of Paleobiology, special issue: Proceedings of the Dublin *Blaschka* Congress, 20.1 (2008).

Hollingshead, John. *A Concise History of the Great Exhibition of 1862: Its Rise and Progress, Its Building and Features and a Summary of All Former Exhibitions* (London: Her Majesty's Commissioners, 1862).

Hopwood, Nick. *Haeckel's Embryos: Images, Evolution, and Fraud* (Chicago, University of Chicago Press, 2015).

——. 'Pictures of Evolution and Charges of Fraud: Ernst Haeckel's Embryological Illustrations', *Isis* 97 (2006), 260-301.

Hornaday, William T. *Our Vanishing Wildlife: Its Extermination and Preservation* (New York: New York Zoological Society, 1913).

Hubbard, Ruth. 'Have Only Men Evolved?' in Ruth Hubbard, Mary Sue Henifen and Barbara Fried, eds, *Women Looking at Biology Looking at Women: A Collection of Feminist Critiques* (Boston: GK Hall, 1979), 7-36.

Hubbell, Sue. *Waiting for Aphrodite: Journeys Into the Time Before Bones* (New York: Houghton Mifflin, 1999).

Hudek, Antony, ed. *The Object* (London and Cambridge: Whitechapel Gallery and MIT Press, 2014).

Hudson, W.H. *Idle Days in Patagonia* (New York: Dutton, 1917).

Humphreys, Mary Gay. *The Art Amateur* 7.6 (Nov. 1882), 130.

Hunter, Mary. 'Science Uncovered', review of Jennifer Tucker, *Nature Exposed* and Barbara Lawson, *The Dark Side of Nature*, *Oxford Art Journal* 32.1 (March 2009), 153-56.

Hurley, Kelly. *The Gothic Body: Sexuality, Materialism, and Degeneration at the Fin de Siècle* (Cambridge: Cambridge University Press, 1996).

Huysmans, Joris-Karls. *Against Nature* (1884), trans. Brendan King (Sawtry, UK: Dedalus, 2008).

Ibis 4.13 (1862), 73-74.

Irving, Henry. 'Preface', in *Macbeth: A Tragedy by William Shakespeare, as Arranged for the Stage by Henry Irving* (London: Nassau, 1889), 5-8.

Jameson, Robert. *A System of Mineralogy, in Which Minerals are Arranged According to Their Natural History Method*, 3rd edn (Edinburgh: Archibald Constable, 1820).

Jann, Rosemary. 'Darwin and the Anthropologists: Sexual Selection and Its Discontents', *Victorian Studies* 37.2 (winter 1994), 287-306.

Johnson, Penny. *Art Nouveau: The Anderson Collection* (Norwich: Sainsbury Centre for Visual Arts, University of East Anglia, 1984).

Jones, Owen. *The Grammar of Ornament* (London: Day and Son, 1856).

Jordanova, Ludmilla. 'Material Models as Visual Culture', in Soraya de Chadarevian and Nick Hopwood, eds, *Models: The Third Dimension of Science* (Stanford, CA: Stanford University Press), 443-51.

——. *Sexual Visions: Images of Gender in Science and Medicine Between the Eighteenth and Twentieth Centuries* (Madison, WI: University of Wisconsin Press, 1989).

Judd, Denis. *Empire: The British Imperial Experience From 1765 to the Present* (1997), 2nd edn (London: I.B. Taurus, 2001).

Kafka, Franz. *The Metamorphosis* (1915), trans. Stanley Corngold (New York: W.W. Norton and Co., 1996).

Karp, Ivan and Steven D. Lavine, eds. *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington, DC: Smithsonian, 1991).

Keller, Evelyn Fox. *Reflections on Gender and Science* (New Haven: Yale University Press, 1985).

Kent, Phillip. 'Survival of the Fittest: The Romanesque Revival, Natural Selection, and Nineteenth century Natural History Museums', *Fabrications*, 11.1 (July 2000), 1-25.

Kingsley, Charles. *Glaucus; Or, the Wonders of the Shore*. 3rd edn (Cambridge: MacMillan and Co., 1856).

Kirby, William and William Spence. *Introduction to Entomology: Or Elements of the Natural History of Insects*, 7th edn (London: Longman et al., 1856).

Kirshenblatt-Gimblett, Barbara. *Destination Culture: Tourism, Museums, and Heritage* (Berkeley: University of California Press, 1998).

Knapp, Sandra and Bob Press. *The Gilded Canopy: Botanical Ceiling Panels of the Natural History Museum* (London: Natural History Museum, 2005).

Knapton, Sarah. 'Natural History Museum Dinosaur 'Dippy' Switched for Blue Whale Skeleton', *The Telegraph* (29 Jan. 2015) <http://www.telegraph.co.uk/news/science/science-news/11375088/Natural-History-Museum-dinosaur-Dippy-switched-for-blue-whale-skeleton.html>

Knight, David. 'Introduction', in William Buckland, *Geology and Mineralogy: Considered with Reference to Natural Theology*, vol. 1 (1836), ed. David Knight (London: Routledge, 2003), vi-xxiv.

Koch, Heidi and Hans-Jürgen Koch. *Blaschka: Gläserne Geschöpfe des Meeres*, exh. cat. (Hamburg: Dölling and Galitz, 2007).

Kohlstedt, Sally Gregory. 'Nature by Design: Masculinity and Animal Display in Nineteenth-Century America', in Ann B. Shteir and Bernard Lightman, eds, *Figuring It Out: Science, Gender, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2006), 110-39.

——. '"*Thoughts in Things*": Modernity, History, and North American Museums', *Isis* 96.4 (2005), 586-601.

Kort, Pamela and Max Hollein, eds. *Darwin: Art and the Search for Origins*, exh. cat. (Frankfurt: Schirn Kunsthalle, 2009).

Kristeva, Julia. *Powers of Horror: An Essay on Abjection*, trans. Leon S. Roudiez (New York: Columbia University Press, 1982).

Kuhn, Thomas. *The Structure of Scientific Revolutions* (1962), 3rd edn (Chicago: University of Chicago Press, 1996).

Lange-Berndt, Petra. *Animal Art: Präparierte Tiere in der Kunst, 1850 – 2000* (Munich: Silke Schreiber, 2009).

——. 'A Parasitic Craft: Taxidermy in the Art of Tessa Farmer', *The Journal of Modern Craft* 7.3 (Nov. 2014), 267-84.

——. 'Unheimliche(s) Gestalten. Damien Hirsts Naturgeschichte und das historische Verfahren der Naßpräparation', in Andreas Haus, Franck Hofmann and Änne Söll, eds, *Material im Prozess. Strategien ästhetischer Produktion* (Berlin, Reimer, Dietrich: 2000), 167-80.

Lankester, E. Ray. *The History of the Collections Contained in the Natural History Departments of the British Museum*, vol. 1. (London: British Museum (Natural History), 1904).

Larson, Barbara. *The Dark Side of Nature: Science, Society, and the Fantastic in the Work of Odilon Redon (University Park, PA:* Pennsylvania State University Press, 2005).

——. 'Darwin's Sexual Selection and the Jealous Male in Fin-de-Siècle Art', in Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 173-93.

Larson, Barbara and Fae Brauer, eds. *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009).

Larson, Barbara and Sabine Flach, eds. *Darwin and Theories of Aesthetics and Cultural History* (Aldershot, UK: Ashgate, 2013).

Latour, Bruno. *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005).

——. *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993).

Laudan, Rachel. *From Mineralogy to Geology: The Foundations of a Science, 1650-1830* (University of Chicago Press, 1987).

Laver, James. *Dandies,* Pageant of History series (London: Weidenfield and Nicolson, 1967).

Leach, Karoline. *In the Shadow of the Dreamchild: A New Understanding of Lewis Carroll* (London: Peter Owen, 1999).

Lebailly, Hughes. 'C. L. Dodgson and the Victorian Cult of the Child', *The Carrollian*, 4 (autumn 1999), 3-31.

Leslie, Esther. *Synthetic Worlds: Nature, Art and the Chemical Industry* (Harmondsworth, UK: Reaktion, 2005).

Levillain, Henriette, ed. *L'Ésprit dandy: de Brummell à Baudelaire* (Paris: Corti, 1991).

Levin, Amy K., ed. *Gender, Sexuality, and Museums: A Routledge Reader* (Abingdon, UK: Routledge, 2010).

Lewes, George Henry. *Sea-Side Studies*, (Edinburgh: Blackwood, 1858).

Lichtenstein, Jacqueline. *The Eloquence of Color: Rhetoric and Painting in the French Classical Age*, trans. Emily McVarish (Berkeley: University of California Press, 1993).

Lightman, Bernard. 'The Visual Theology of Victorian Popularizers of Science: From Reverent Eye to Chemical Retina', *Isis* 91.4 (Dec. 2000), 651-80.

Lockhurst, Roger. 'Trance-Gothic, 1882-1897', in Ruth Robbins and Julian Wolfreys, eds, *Victorian Gothic: Literary and Cultural Manifestations in the Nineteenth Century* (Basingstoke, UK: Palgrave, 2000), 148-67.

Lowe, Miranda and C. Giles Miller, 'A Scientific Perspective on the Acquisition and Display of the Natural History Museum Blaschka Collections', in *Art Forms from the Ocean*, exh. cat. (Sunderland UK: National Glass Centre, 2008), 11-18.

Lyell, Charles. *Principles of Geology*, 3 vols (London: John Murray, 1830-1833).

Machin, Rebecca. 'Gender Representation in the Natural History Galleries at the Manchester Museum', *Museum and Society* 6.1 (Mar. 2008), 54-67.

MacKenzie, John. *Museums and Empire: Natural History, Human Cultures and Colonial Identities* (Manchester: Manchester University Press, 2009).

Maleuvre, Didier. *Museum Memories: History, Technology, Art* (Palo Alto: Stanford University Press, 1999).

Mansoor, Jaleh. 'Notes on Militant Folds: Against Weigel and Ahern's "Further Materials Toward a Theory of the Man-Child', *The Claudius App (August 2013), <http://theclaudiusapp.com/5-mansoor.html>*

Marsh, Richard. *The Beetle* (1897), ed. Julian Wolfreys (Peterborough, ON: Broadview, 2004).

Mayhew, Henry. *London Labour and the London Poor*, vol. 1 (London: G. Woodfall and Son, 1851).

McShine, Kynaston, ed. *The Museum as Muse: Artists Reflect*, exh. cat. (New York: Museum of Modern Art, 1999).

Meechan, Chris. 'A Glass Menagerie: The Work of Leopold and Rudolph [sic] Blaschka', *Glass Cone* 39 (spring 1995), 4-5.

Meechan, Chris and Henri Reiling. 'Leopold and Rudolf Blaschka and Natural History in the Nineteenth Century', in James Peto and Angie Hudson, eds, *Leopold and Rudolf Blaschka*, exh. cat. (London: Design Museum, 2002), 12-23.

Michelet, Jules. *The Sea* (1861), trans. W.H. Davenport Adams, London: T. Nelson & Sons, 1875).

Millais, John Guille. *The Life and Letters of Sir John Everett Millais* (Toronto: G.N. Morang, 1900).

Miller, C. Giles. 'Micropalaeontological Models at the Natural History Museum, London', *The Geological Curator* 7.7 (2003), 263-74.

Miller, C. Giles and Miranda Lowe, 'The Natural History Museum Blaschka Collections', *Historical Biology* 20.1 (2008), 51-62.

Mills, Brett. 'The Animals Went in Two by Two: Heteronormativity in Television Wildlife Documentaries', *European Journal of Cultural Studies* 16.1 (Feb. 2013), 100-114.

Mills, Robert. 'Queer is Here? Lesbian, Gay, Bisexual and Transgender Histories in Public Culture', in Amy K. Levin, ed., *Gender, Sexuality, and Museums: A Routledge Reader* (Abingdon, UK: Routledge, 2010), 80-88.

Mitchell, W.J.T. *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago: University of Chicago Press, 1998).

——. 'Romanticism and the Life of Things: Fossils, Totems, and Images', *Critical Inquiry* 28.1 (autumn 2001), 167-84.

——. 'What Do Pictures Want?' in Terry Smith, ed., *In Visible Touch: Modernism and Masculinity* (Chicago: University of Chicago Press, 1997), 215-32.

Monahan, Nigel, Julia Sigwart and Catherine McGuinness. *Blaschka Glass Models*, exh. cat. (Dublin: National Museum of Ireland, 2006).

Morrell, J.B. 'Professionalisation', in R.C. Olby et al., *Companion to the History of Modern Science* (London: Routledge, 1990), 980-89.

Morris, P.A. 'The Development of Bird Taxidermy', in *A History of Taxidermy: Art, Science and Bad Taste* (London: MPM, 2010).

Morse, Deborah Denenholz and Martin Danahay, 'Introduction', in Morse and Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 1-12.

Morton, Marsha. 'From Monera to Man: Ernst Haeckel, *Darwinismus*, and Nineteenth-Century German Art', in Barbara Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 59-91.

Munro, Jane. 'More Like a Work of Art', in Diana Donald and Munro, eds, *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (New Haven: Yale University Press, 2009), 258-90.

Nead, Lynda. *Victorian Babylon: People, Streets and Images in Nineteenth-Century London* (New Haven: Yale University Press, 2000).

Neill, Anna. *Primitive Minds: Evolution and Spiritual Experience in the Victorian Novel* (Columbus: Ohio State University Press, 2013).

Nelson, Brian. 'Introduction', in Émile Zola, *The Ladies' Paradise* (1883), ed. and trans. Brian Nelson (Oxford: Oxford University Press, 1995), vii-xxiii.

Newey, Katherine. 'Speaking Pictures: The Victorian Stage and Visual Culture', in Anselm Heinrich, Katherine Newey and Jeffrey Richards, eds, *Ruskin, the Theatre and Victorian Visual Culture* (Basingstoke, UK: Palgrave MacMillan, 2009), 1-15.

Newton, Alfred. *A Dictionary of Birds* (London: Adam and Charles Black, 1893-96).

Noakes, Richard. 'Spiritualism, Science and the Supernatural in Mid-Victorian Britain', in Nicola Bown, Carolyn Burdett and Pamela Thurschwell, eds, *The Victorian Supernatural* (Cambridge: Cambridge University Press, 2004), 23-43.

Nordau, Max. *Degeneration* (1892), trans. George L. Mosse (Lincoln, NE: University of Nebraska Press, 1993), in David Batchelor, ed., *Colour* (London: Whitechapel and MIT Press, 2008), 42-44.

O'Connor, Ralph. *The Earth on Show: Fossils and the Poetics of Popular Science, 1802-1856* (Chicago: University of Chicago Press, 2007).

O'Gorman, Francis. 'Manliness and the History of Ruskin in Love: Writing Ruskin's Masculinity from W.G. Collingwood to Kate Millett', in Dinah Birch and Francis O'Gorman, eds, *Ruskin and Gender* (New York: Palgrave, 2002), 10-28.

Oppenheim, Janet. *The Other World: Spiritualism and Psychical Research in England*, 1850-1914 (Cambridge: Cambridge University Press, 1985).

Ouida, *Moths*, 3 vols. (London: Chatto & Windus, 1880).

Outram, Dorinda. 'New Spaces in Natural History', in Nicholas Jardine, James Secord and Emma Spary, eds, *Cultures of Natural History* (Cambridge: Cambridge University Press, 1996), 249-65.

Owen, Richard. *On the Extent and Aims of a National Museum of Natural History* (London: Saunders, Otley and Co., 1862).

Paley, William. *Natural Theology* (1802), ed. Matthew D. Eddy and David Knight (Oxford: Oxford University Press, 2006).

Palmer, Beth. 'Theatricality and Performance in Victorian Literature And Culture', *Victorian Network* 3.2 (winter 2011), 1-6.

Pascoe, Judith. *The Hummingbird Cabinet: A Rare and Curious History of Romantic Collectors* (Ithaca: Cornell University Press, 2006).

Passos Leite, Maria Fernanda. *René Lalique at the Calouste Gulbenkian Museum* (Milan: Skira, 2008).

Pearce, Susan, ed. *Interpreting Objects and Collections* (London: Routledge, 1994).

——. *Museums, Objects and Collections: A Cultural Study* (Leicester: Leicester University Press, 1992).

Peto, James and Angie Hudson, eds. *Leopold and Rudolf Blaschka*, exh. cat. (London: Design Museum, 2002).

Philips, Clare. 'Jewellery and the Art of the Goldsmith', in Greenhalgh, ed., *Art Nouveau 1890-1914*, exh. cat. (London: V&A, 2000), 236-49.

Phillips, William. *An Elementary Introduction to Mineralogy* (1823), new edn with extensive alterations and additions by H.J. Brooke and W.H. Miller (London: Longman, Brown, Green, and Longmans, 1852).

Pointon, Marcia. *Brilliant Effects: A Cultural History of Gemstones and Jewellery* (New Haven: Yale University Press, 2009).

Pollock, Griselda. 'Feminist Interventions in the History of Art: An Introduction', in *Vision and Difference: Feminism, Femininity and the Histories of Art* (1988), new edn (London: Routledge, 2003), 1-24.

Pomian, Krzysztof. *Collectors and Curiosities: Paris and Venice, 1500-1800*, trans. Elizabeth Wiles-Portier (Cambridge: Polity Press, 1990).

Ponte, Alessandra. 'Building the Stair Spiral of Evolution: The Index Museum of Sir Patrick Geddes', trans. Jessica Levine, *Assemblage* 10 (Dec. 1989), 46-64.

Power, Nina. 'She's Just Not That Into You', *Radical Philosophy* (2012) <http://www.radicalphilosophy.com/web/rp177-shes-just-not-that-into-you>

Preziosi, Donald. *Brain of the Earth's Body: Art, Museums, and the Phantasms of Modernity* (Minneapolis: University of Minnesota Press, 2003).

Prodger, Phillip. 'Ugly Disagreements: Darwin and Ruskin Discuss Sex and Beauty', in Barbara Larson and Fae Brauer, eds, *The Art of Evolution: Darwin, Darwinisms, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2009), 40-58.

Putnam, James. *Art and Artifact: The Museum as Medium*, 2nd edn (London: Thames and Hudson, 2009).

Rappaport, Erika. *Shopping for Pleasure: Women in the Making of London's West End* (Princeton, NJ: Princeton University Press, 2000).

Raworth, Kate. 'Must the Anthropocene be a Manthropocene?' *The Guardian website*

<http://www.theguardian.com/commentisfree/2014/oct/20/anthropocene-working-group-science-gender-bias> accessed 9 July 2015.

Reiling, Henri. 'The Blaschkas' Glass Animal Models: Origins of Design', *Journal of Glass Studies* 40 (1998), 105-26.

——. 'Glass Models of Soft Bodied Animals: The Relation Between Blaschka, Fric and the National Museum', *Journal of the National Museum, Natural History Series*, 171.1-4 (2002), 81-84.

Rennie, James. *Bird-Architecture* (1844), rev. edn (London: G. Cox, 1853).

Reynolds, Ann. 'Reproducing Nature: The Museum of Natural History as Nonsite', *October* 45 (summer, 1988), 109-27.

Richards, Evelleen. 'Darwin and the Descent of Women', in David Oldroyd and Ian Langham, eds, *The Wider Domain of Evolutionary Thought*, vol. 2 (Dordrecht, NL: D. Reidel, 1983), 57-111.

Richards, Robert J. *The Tragic Sense of Life: Ernst Haeckel and the Struggle Over Evolutionary Thought* (Chicago: University of Chicago Press, 2008).

Ritvo, Harriet. *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, MA: Harvard University Press, 1987).

Robson, Catherine. *Men in Wonderland: The Lost Girlhood of the Victorian Gentleman* (Princeton: Princeton University Press, 2001).

——. 'The Stones of Childhood: Ruskin's "Lost Jewels"', in Dinah Birch and Francis O'Gorman, eds, *Ruskin and Gender* (New York: Palgrave, 2002), 29-46.

Rossi-Wilcox, Susan M. Henri Reiling and Philip Bisaga. 'The Blaschkas' Lampworking Tables', *Journal of Glass Studies* 45 (2003), 167-76.

Rozwadowski, Helen M. *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea* (Cambridge, MA: Harvard University Press, 2005).

Rudwick, Martin J.S. *The Meaning of Fossils: Episodes in the History of Paleontology* (New York: Elsevier, 1972).

——. *Scenes from Deep Time: Early Pictorial Representations of the Prehistoric World* (Chicago: University of Chicago Press, 1992).

Rupke, Nicolaas. *Richard Owen: Biology Without Darwin*, rev. edn (Chicago: University of Chicago Press, 2009).

Ruskin, *Catalogue of a Series of Specimens in the British Museum (Natural History) Illustrative of the More Common Forms of Native Silica* (Sunnyside, UK: George Allen, 1884).

——. *Deucalion: Collected Studies of the Lapse of Waves, and Life of Stones*, vol. 1 (Sunnyside, UK: George Allen, 1879).

——. *The Eagle's Nest: Ten Lectures of the Relation of Natural Science to Art* (London: George Allen, 1872).

——. *The Elements of Drawing* (London: Smith, Elder and Co., 1857).

——. *Ethics of the Dust: Ten Lectures to Little Housewives on the Elements of Crystallisation* (London: Smith, Elder, 1866).

——. 'Iris of the Earth', in *Deucalion: Collected Studies of the Lapse of Waves, and Life of Stones*, vol. 1 (Sunnyside, UK: George Allen, 1879), 97-139.

——. *Modern Painters: Their Superiority in the Art of Landscape Painting*, vol. 1 (London: Smith, Elder and Co., 1843).

——. *Modern Painters: Their Superiority in the Art of Landscape Painting*, vol. 4 (London: Smith, Elder and Co., 1856).

——. 'Of Butter and Honey', in *Deucalion: Collected Studies of the Lapse of Waves, and Life of Stones*, vol. 1 (Sunnyside, UK: George Allen, 1879), 84-96.

——. 'Of Ice-Cream', in *Deucalion: Collected Studies of the Lapse of Waves, and Life of Stones*, vol. 1 (Sunnyside, UK: George Allen, 1879), 40-56.

——. *Pre-Raphaelitism* (New York: Wiley, 1851).

——. *Proserpina: Studies of Wayside Flowers*, vol. 2 (London: George Allen, 1882).

——. *The Seven Lamps of Architecture* (London: Smith, Elder, 1849).

——. *The Stones of Venice*, vols 1-3 (London: Smith, Elder and Co., 1851-53).

Russell, Roslyn. *The Business of Nature: John Gould and Australia* (Canberra: National Library of Australia, 2011).

Russett, Cynthia Eagle. *Sexual Science: The Victorian Construction of Womanhood* (Cambridge: Harvard University Press, 1989).

Sample, Ian. 'Anthropocene: is this the new epoch of humans?' *The Guardian website* <http://www.theguardian.com/science/2014/oct/16/-sp-scientists-gather-talks-rename-human-age-anthropocene-holocene>

Sand, George. *Laura: A Journey into the Crystal* (1864), trans. Sue Dyson (London: Pushkin, 2004).

Schaffer, Talia. 'Fashioning Aestheticism by Aestheticizing Fashion: Wilde, Beerbohm, and the Male Aesthetes' Sartorial Codes', *Victorian Literature and Culture* 28.1 (2000), 39-54.

——. *Forgotten Female Aesthetes: Literary Culture in Late-Victorian England* (Charlottesville, VA: University of Virginia Press).

——. *Novel Craft: Victorian Domestic Handicraft and Nineteenth-Century Fiction* (New York: Oxford University Press, 2011).

Schiebinger, Londa. *Nature's Body: Gender in the Making of Modern Science* (Boston: Beacon, 1993).

Schmitt, Cannon. *Alien Nation: Nineteenth-Century Gothic Fictions and English Nationality* (Philadelphia: University of Pennsylvania Press, 1997).

——. 'Victorian Beetlemania', in Deborah Denenholz Morse and Martin Danahay, eds, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot, UK: Ashgate, 2007), 35-51.

Schroeder, Natalie. 'Introduction', in Ouida, *Moths* (1880), ed. Schroeder (Peterborough, ON: Broadview, 2005), 9-36.

Schwartz, Hillel. *The Culture of the Copy: Striking Likenesses, Unreasonable Facsimiles* (New York: Zone Books, 1996).

Scott, Monique. *Rethinking Evolution in the Museum: Envisioning African Origins* (New York: Routledge, 2007).

'Shaking Some Tail Feathers: New Bird Displays', *Evolve*, Natural History Museum Magazine, 23 (spring 2015), 18-19.

Sheets-Pyenson, Susan. *Cathedrals of Science* (Kingston and Montreal: McGill-Queens University Press, 1988).

Shermer, Michael. *In Darwin's Shadow: The Life and Science of Alfred Russel Wallace* (New York: Oxford University Press, 2002)

Showalter, Elaine. *Sexual Anarchy: Gender and Culture at the* Fin de Siècle (London: Bloomsbury, 1991).

Shteir, Ann B. and Bernard Lightman, eds. *Figuring It Out: Science, Gender, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2006).

Sigwart, Julia. 'Crystal Creatures: Context for the Dublin Blaschka Congress', *Historical Biology* 20.1 (2008), 1-10.

Silverman, Debora L. *Art Nouveau in Fin-de-Siècle France: Politics, Psychology, and Style* (Berkeley: University of California Press, 1989).

Simmonds, Peter Lund. *The Commercial Products of the Animal Kingdom Employed in the Arts and Manufactures Shown in the Collection of the Bethnal Green Branch of the South Kensington Museum* (London: Eyre and Spottiswoode, 1880).

Sleigh, Charlotte. 'Inside Out: The Unsettling Nature of Insects', in Eric C. Brown, ed., *Insect Poetics* (Minneapolis: University of Minnesota Press, 2006), 281-97.

Slocombe, Emma. 'Lady Macbeth at the Lyceum', *Apollo*, NT Historic Houses and Collections Annual (2011), 4-11.

Smith, Charles H. 'Alfred Russel Wallace on Spiritualism, Man and Evolution: An Analytical Essay', self-published pamphlet (Torrington, CT, 1992).

Smith, Jonathan. *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006).

——. 'Evolutionary Aesthetics and Victorian Visual Culture', in Diana Donald and Jane Munro, eds, *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (New Haven: Yale University Press, 2009), 85-109.

——. 'Picturing Sexual Selection: Gender and the Evolution of Ornithological Illustration in Charles Darwin's *Descent of Man',* in Ann B. Shteir and Bernard Lightman, eds, *Figuring It Out: Science, Gender, and Visual Culture* (Hanover, NH: Dartmouth College Press, 2006), 85-109.

Smith, Lindsay. 'The Foxglove and the Rose: Ruskin's Involute of Childhood', in eds Dinah Birch and Francis O'Gorman, *Ruskin and Gender* (New York: Palgrave, 2002), 47-63.

Snell, Susan and Polly Tucker. *Life Through a Lens: Photographs from the Natural History Museum 1880-1950* (London: Natural History Museum, 2003).

Sofer, Gates. 'Investigation of a Victorian ornithological adornment', *Conservation Journal* 57 (Spring 2009)

<http://www.vam.ac.uk/content/journals/conservation-journal/issue-57/investigation-of-a-victorian-ornithological-adornment/>

South Kensington Museum. *Catalogue of the Collection of Animal Products, South Kensington Museum*, 2nd edn (London: Eyre and Spottiswoode, 1860).

Sowerby, Henry. *Popular Mineralogy; Comprising a Familiar Account of Minerals and Their Uses* (London: Reeve and Benham, 1850).

Spary, Emma C. 'Codes der Leidenschaft: Französische Vogelsammlungen als eine Sprache der vornehmen Gesellschaft im 18. Jahrhundert', in Spary and Anke te Heesen, *Sammeln als Wissen. Das Sammeln und seine wissenschaftsgeschichtliche Bedeutung* (Göttingen: Wallstein, 2001), 39-61.

Spencer, Herbert. 'Gracefulness', in *Essays: Scientific, Political, and Speculative*, vol. 3 (London: Williams and Norgate, 1878), 312-18.

——. 'Progress: Its Law and Cause', in *Essays: Scientific, Political, and Speculative*, vol. 3 (London: Williams and Norgate, 1878), 1-60.

——. 'Transcendental Physiology', in *Essays: Scientific, Political, and Speculative*, vol. 3 (London: Williams and Norgate, 1878), 369-420.

Spivak, Gayatri. 'Can the Subaltern Speak?' in C. Nelson and L. Grossberg, eds, *Marxism and the Interpretation of Culture* (Basingstoke, UK: MacMillan, 1988), 271-313.

Stafford, Barbara. *Good Looking: Essays on the Virtues of Images* (Cambridge, MA: MIT Press, 1996).

Stearn, William T. *The Natural History Museum at South Kensington: A History of the British Museum (Natural History) 1753-1980* (London: Heinemann, 1981).

Steedman, Carolyn. *Dust* (Manchester: Manchester University Press, 2001).

Stokes, John. 'Shopping in Byzantium: Oscar Wilde as Shakespeare Critic', in Gail Marshall and Adrian Poole, eds, *Victorian Shakespeare, Volume I: Theatre, Drama and Performance* (Basingstoke: Palgrave MacMillan, 2004), 178-91.

Stone, Harry, ed. *The Uncollected Writings of Charles Dickens: Household Words 1850-1859*, vol. 1 (London: Penguin, 1968).

Story-Maskelyne, Mervin Herbert Nevil. *Catalogue of the Collection of Meteorites Exhibited in the Mineral Department of the British Museum* (London: British Museum (Natural History), 1869).

Stott, Rebecca. *Darwin and the Barnacle* (London: Faber and Faber, 2003).

——. 'Darwin's Barnacles: Mid-Century Victorian Natural History and the Marine Grotesque', in Roger Lockhurst and Josephine McDonagh, eds, *Transactions and Encounters: Science and Culture in the Nineteenth Century* (Manchester: Manchester University Press, 2002), 151-81.

Stryker, Susan and Paisley Currah, 'General Editors' Introduction', *TSQ: Transgender Studies Quarterly*, special issue: Tranimalities, ed. Eva Hayward and Jami Weinstein, 2.2 (May 2015), 189-94.

'Suffrage For Both Sexes', *Punch's Almanac* (2 Apr. 1870).

Swinney, Geoffrey. 'Enchanted Invertebrates: Blaschka Models and Other Simulacra in National Museums Scotland', *Historical Biology* 20.1 (2008), 39-50.

Terry, Ellen. *The Story of My Life* (New York: Doubleday, 1909).

Thackray, John and Bob Press. *Nature's Treasurehouse: A History of the Natural History Museum* (London: Natural History Museum, 2013).

Tiqqun. *Preliminary Materials for a Theory of the Young-Girl* (1999), trans. Ariana Reines (Los Angeles: Semiotext(e), 2012).

Todorov, Tzvetan. *The Fantastic: A Structural Approach to a Literary Genre*, trans. Richard Howard (New York: Cornell University Press, 1975).

Tolini, Michelle. '"Beetle Abominations" and Birds on Bonnets: Zoological Fantasy in Late-Nineteenth-Century Dress', *Nineteenth Century Art Worldwide* 1.1 (spring 2002) <http://www.19thc-artworldwide.org/index.php/spring02/206-qbeetle-abominationsq-and-birds-on-bonnets-zoological-fantasy-in-late-nineteenth-century-dress>

Tree, Isabella. *The Bird Man: The Extraordinary Story of John Gould* (1991), 2nd edn (London: Ebury, 2003).

Tuana, Nancy. 'The Weaker Seed: The Sexist Bias of Reproductive Theory', in Tuana, ed., *Feminism and Science* (Bloomington, IN: Indiana University Press, 1989), 147-71.

Ugolini, Laura. *Men and Menswear: Sartorial Consumption in Britain 1880-1939* (Aldershot, UK: Ashgate, 2007).

Van Dijck, José. *The Transparent Body: A Cultural Analysis of Medical Imaging* (Seattle: University of Washington Press, 2005).

Veder, Robin. 'Mother-Love for Plant-Children: Sentimental Pastoralism and Nineteenth-Century Parlour Gardening', *Australasian Journal of American Studies*, 26.2 (Dec. 2007), 20-34.

Virgil. 'Georgics IV' (c. 29 BCE), in *The Works of Virgil Translated into English Prose*, trans. C. Davidson, vol. 1 (London: Geo. B. Whittaker et al, 1826).

Von Hübl, Arthur Freiherrn. *Three Colour Photography: Three-Colour Printing and the Production of Photographic Pigment in Natural Colours* (1897), 2nd edn, trans. Henry Oscar Klein (London: A.W. Penrose & Co., 1904).

Voskuil, Lynn M. *Acting Naturally: Victorian Theatricality and Authenticity* (Charlottesville, VA: University of Virginia Press, 2004).

Voss, Julia. *Darwin's Pictures: Views of Evolutionary Theory, 1837-1874*, trans. Lori Lantz (London: Yale University Press, 2010).

Walkowitz, Judith. *City of Dreadful Delight: Narratives of Sexual Danger in Late-Victorian London* (London: Virago, 1992).

Wallace, Alfred Russel. 'Humming-Birds', *Fortnightly Review*, no. 22 (July-Dec. 1877), 775.

——. *Island Life: Or, The Phenomena and Causes of Insular Faunas and Floras, Including a Revision and Attempted Solution of the Problem of Geological Climates* (London: Harper and Brothers, 1881).

——. *The Malay Archipelago*, vol. 2 (London: Macmillan, 1869).

——. 'Notes on the Growth of Opinion as to Obscure Psychical Phenomena During the Last Fifty Years', *The Alfred Russel Wallace Page hosted by Western Kentucky University* <http://people.wku.edu/charles.smith/wallace/S478.htm>

——. 'The Scientific Aspect of the Supernatural', *The English Leader* (Aug. and Sept. 1866).

Warmus, William. *Emile Gallé: Dreams Into Glass*, exh. cat. (Corning, NY: Corning Museum of Glass, 1984).

Warner, Marina. *Fantastic Metamorphoses, Other Worlds: Ways of Telling the Self* (Oxford: Oxford University Press, 2002).

Waterhouse, Chas O. *Notes on the Various Collections of Insects in the Insect Room of the British Museum* (London: William Clowes, 1900).

Weigel, Moira and Mal Ahern, 'Further Materials Toward a Theory of the Man-Child', *The New Inquiry* (9 July 2013) <http://thenewinquiry.com/essays/further-materials-toward-a-theory-of-the-man-child/>

Weltman, Sharon Aronofsky. *Performing the Victorian: John Ruskin and Identity in Theater, Science, and Education* (Columbus: Ohio State University Press, 2007).

Whitehead, P.J.P. and Colin Keates. *The British Museum (Natural History)* (London: Philip Wilson in association with the British Museum (Natural History).

Wilde, Oscar. 'The Critic as Artist', in *The Artist as Critic: Critical Writings of Oscar Wilde*, ed. Richard Ellmann (London: W. H. Allen, 1970), 341-407.

Wilson, Elizabeth. 'The Invisible *Flâneur*', *New Left Review* 171 (Jan./Feb. 1992), 90-110.

Wilson, Elizabeth A. 'Biologically Inspired Feminism: Response to Helen Keane and Marsha Rosengarten, "On the Biology of Sexed Subjects"', *Australian Feminist Studies* 17.39 (2002), 283-85.

Winter, Alison. *Mesmerized: Powers of Mind in Victorian Britain* (Chicago: University of Chicago Press, 1998).

Wolff, Janet. 'The Invisible Flâneuse: Women and the Literature of Modernity', *Theory, Culture, and Society* 2.3 (November 1985), 37-46.

Wolfreys, Julian. 'The Hieroglyphic Other: *The Beetle*, London, and the Abyssal Subject', in Lawrence Phillips, ed., *A Mighty Mass of Brick and Smoke: Victorian and Edwardian Representations of London* (Amsterdam: Rodopi, 2007), 169-92.

——. 'Introduction', in Richard Marsh, *The Beetle* (1897), ed. Wolfreys (Peterborough, ON: Broadview, 2004), 9-34.

Wonders, Karen. *Habitat Dioramas: Illusions of Wilderness in Museums of Natural History* (Uppsala: Almqvist and Wiksell, 1993).

Wood, J.G. *Insects at Home: British Insects, Their Structure, Habits, and Transformations* (London: Longmans, Green, and Co., 1872).

Yanni, Carla. *Nature's Museums: Victorian Science and the Architecture of Display* (New York: Princeton Architectural Press, 2005).

Zola, Émile. *The Ladies' Paradise* (1883), ed. and trans. Brian Nelson (Oxford: Oxford University Press, 1995).

Online Resources and Other Media

'The Actor and the Maker: Ellen Terry and Alice Comyns-Carr', *V&A website* <http://www.vam.ac.uk/content/articles/t/the-actor-and-the-maker-ellen-terry-and-alice-comyns-carr/>

The Alfred Russel Wallace Website <http://wallacefund.info/>

'Anthropocene Feminism' conference, Center for 21st Century Studies, University of Minnesota (10-12 Apr. 2014) <http://c21uwm.com/anthropocene/>

'The Anthropocene Project', *Haus der Kulturen der Welt website* <http://www.hkw.de/en/programm/projekte/2014/anthropozaen/anthropozaen_2013_2014.php>

British Museum website: Collection Online <http://www.britishmuseum.org/research/collection_online/>

Buckland, Adelene. 'Shows of London: Rocks' seminar, Courtauld Institute (9 Mar. 2011).

'Centre for Art and Humanities Research', *Natural History Museum website: Research and Curation* <http://www.nhm.ac.uk/research-curation/science-facilities/cahr/index.html>

'Dippy, *NHM website* <http://www.nhm.ac.uk/visit-us/galleries/green-zone/hintze-hall/dippy/index.html>

'The Glass Flowers', *Harvard Museum of Natural History* <http://hmnh.harvard.edu/glass-flowers>

Holmes, John. 'A Cathedral to Nature', lecture, Natural History Museum (24 June 2013), DVD recording.

'Insecta', *Encyclopedia of Life* <http://eol.org/pages/344/overview>

Natural History Museum, 'Strategy to 2020', *Natural History Museum website: Our Vision* (2015) <http://www.nhm.ac.uk/content/dam/nhmwww/about-us/our-vision/NHM%20Strategy%20to%202020.pdf>

'The Nature of Jewellery', *The First Moderns: Art Nouveau, from Nature to Abstraction*, exhibition text (Sainsbury Centre for Visual Arts, Feb. 2012-Dec. 2013).

Patchett, Merle. *Fashioning Feathers: Dead Birds, Millinery Crafts and the Plumage Trade*, online exhibition <http://fashioningfeathers.com>

'Petitioning Natural History Museum: Save Dippy', petition mounted by Metro UK, *Change.Org* <https://www.change.org/p/natural-history-museum-save-dippy> accessed 27 June 2015.

Slocombe, Emma, curator, National Trust. 'Dress in the Limelight', powerpoint presentation (2011).

‘Terracotta Tour: Cathedral of Nature’, *Natural History Museum website* <http://nhm.ac.uk/visit-us/history-architecture/architectural-tour/cathedral-of-nature/index.html>

V&A: Search the Collections <http://collections.vam.ac.uk>

‘Wallace Collection: Collecting’, *NHM Website* <http://www.nhm.ac.uk/nature-online/collections-at-the-museum/wallace-collection/collecting.jsp>

‘Waterhouse Collection, Special Collections’, *University of Reading website* <http://www.reading.ac.uk/special-collections/collections/sc-waterhouse.aspx>