Darwin and Beauty: 1859-1882

Vol. 1 of 2

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Abstract

Between 1859 and 1882 two developments took place, one in science and the other in art. In science, Charles Darwin published his theory of sexual selection which proposed beauty as an evolved characteristic, and in art, Aestheticism became the leading movement in England. The subsequent debate about beauty raised questions about God, gender, progress and race. A close examination of the arguments in both science and art reveals otherwise hidden assumptions which are shown to influence the way in which beliefs changed. I consider the type of changes that took place and the influence of Darwin's work and that of certain artists.

Darwin did not follow trends in art and few artists read the scientific literature and so their work was independent yet both helped bring about similar changes. This suggests that those changes were part of a broader set of social changes. I look at the cultural influences on Darwin and show how his ideas changed as his thinking about beauty and sexual selection developed. I propose a 'theory of beauty' based on Darwin's extensive writing on sexual selection and I use it as a tool to examine key works by leading artists in order to show how their methods of representation were influenced by the same cultural changes.

Artworks by Dante Gabriel Rossetti, John Everett Millais, James McNeill Whistler, G. F. Watts, Frederic Leighton, Albert Moore, Christopher Dresser, Edward Burne-Jones, Linley Sambourne and others are used to show how art and science were intimately related by subtle threads of complex relationships. The works are viewed with respect to changing ideas about beauty, nature, perfection and idealization, and the ugly, the grotesque and the degenerate in the context of Darwin's theories and changing artistic representations. A new reason for the rise of aestheticism is suggested, based on the way that beauty became an agent for social change.

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Finally, I would like to thank all the authors whose books and articles have been my source of ideas and inspiration for my work, particularly Charles Darwin.

And Val for putting up with it for so long for a second time.

Author’s Declaration

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's Regulations and Code of Practice for Research Degree Programmes and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED: ..... DATE: ..22 August 2012.....

Table of Contents

List of Illustrations

The illustrations are provided in Volume 2. Artworks are oil on canvas unless otherwise stated and dimensions are in centimetres.

Figure 21: Holman Hunt, *The Scapegoat*, 1854-6, 86 × 140, Lady Lever Art Gallery, Liverpool, a smaller version, 33.7 × 45.9, is at Manchester Art Gallery

Figure 22: L. Allen Goss, Maphoon, Moung-Phoset and Mah-Mé, *c*. 1872, photograph, from which the illustration 'Une Famille Velue En Birmanie', *La Nature,* premier semester 1875, p. 121 was engraved

Figure 23: Thomas Woolner, Human ear, from Charles Darwin, *The Descent of Man, and Selection in Relation to Sex,* Vol. 1, 1st edn (London: John Murray, 1871), p. 22

Figure 24: Frances Griffiths, photograph of Elsie Wright, ' Fairy Offering Posy of Harebells to Elsie', 1917, first published *The Strand Magazine*, December 1920, pp. 463-68

Figure 25: James McNeill Whistler, *Coast of Brittany* (*Alone with the Tide*), 1861, 87.3 × 115.6, Wadsworth Atheneum, Hartford, first exhibited Royal Academy, 1862

Figure 26: James McNeill Whistler, *Nocturne in Blue and Silver*, 1872-8, 44.5 × 61, Yale Center for British Art

Figure 27: James McNeill Whistler, *Nocturne in Blue and Gold, Valparaiso Bay*, 1866, 75.6 × 50.2, Freer Gallery of Art

Figure 28: James McNeill Whistler, *Crepuscule in Flesh Colour and Green: Valparaiso*, 1866, 58.4 × 75.9, Tate Britain

Figure 29: James McNeill Whistler, *Nocturne in Black and Gold: Falling Rocket*, 1875, oil on wood, 60.4 × 46.7, The Detroit Institute of Art

Figure 30: Henry Taunt, Battersea Bridge, 1878, photograph, Oxfordshire County Council Photographic Archive, HT2666

Figure 31: James McNeill Whistler, *Nocturne: Blue and Silver—Chelsea*, 1871, oil on wood, 50.2 × 60.3, Tate Britain

Figure 32: 'Gorilla Ambassador', Preface to *Punch Almanack 1861*, p. iii

Figure 33: Thomas Nast, 'St. Patrick's Day, 1867—The day we celebrate.', wood engraving, *Harper's Weekly*, 6 April 1867, p. 212

Figure 34: 'Monkeyana: Am I a Man and a Brother?' *Punch*, 18 May 1861, p. 206

Figure 35: 'The New Photographic Looking Glass', *Punch*, 23 November 1861, p. 204

Figure 36: 'The Lion of the Season', *Punch*, 25 May 1861, p. 213

Figure 37: John Leech, 'Mr. G. O'Rilla, the Young Ireland Party, Exulting over the Insult to the British Flag. Shouldn't He Be Extinguished at Once!', *Punch*, 14 December 1861, p. 244

Figure 38: 'The Gorilla Family at the Sea-Side', *Fun*, 21 September 1861, p. 7

Figure 39: 'Exactly So!', *Fun*, 25 January 1873, p. 44

Figure 40: Laurence Shafe, composite of a wolf, a bear and the animal in Whistler's *Symphony in White, No. 1* created from Fig. 3, a photograph of a grey wolf <http://animals.nationalgeographic.com/animals/mammals/wolf/> [Accessed 22 August 2012] and a photograph of a brown bear

Figure 136: John Everett Millais, study for *Christ in the House of His Parents*, *c*.1849, pencil on paper, 19 × 33.7, Tate Britain

Figure 137: Annibale Carracci, *The Butcher's Shop*, 1580-90, 185 × 266, Christ Church Picture Gallery, Oxford

Figure 138: John Rogers Herbert, *Our Saviour Subject to His Parents at Nazareth*, 1847-60, 101.6 × 157.5, Forbes Magazine Collection, there is a smaller version (81.3 × 129.5) at Guildhall Art Gallery, London

Figure 139: Annibale Carracci, 'The Holy Family in a Carpenter's Shop (Le Raboteur)', illustration, *Illustrated London News*, 8 November 1856, p. 475

Figure 140: Annibale Carracci, *The Holy Family with the Infant Saint John the Baptist* ('*The Montalto Madonna*'), *c*. 1600, oil on copper, 35 × 27.5, acquired 2004, National Gallery, London

Figure 141: Carlo Crivelli, *l'Annunciazione con Sant'Emidio* (*Annunciation, with St. Emidius*), 1486, egg and oil on canvas, 207 × 146.7, National Gallery, London

Figure 142: Dante Gabriel Rossetti, *The Girlhood of Mary Virgin*, 1848-9, 832 × 654, Tate Britain

Figure 143: Dante Gabriel Rossetti, *Ecce Ancilla Domini!* (*The Annunciation*), 1849-50, 724 × 419, Tate Britain

Figure 144: Dante Gabriel Rossetti, *Faust: Gretchen and Mephistopheles in the Church*, pen and ink, 27.3 × 20.6, Mrs. J. A. R. Munro

Figure 145: Hermann Ploucquet, *Kittens at Tea - Miss Paulina Singing*, photograph, exhibited at the Great Exhibition, 1851

Figure 146: Christopher Dresser, *Goat Vase*, 1892-96, glazed earthenware and moulded, 26.5 tall, William Ault Pottery, Victoria & Albert Museum

Figure 147: Christopher Dresser, *Tongue Vase*, *c*.1893, glazed earthenware and moulded, 31.8 tall, William Ault Pottery, Victoria & Albert Museum

Figure 148: Edward Burne-Jones, *The Mermaid*, 1882, gouache and watercolour on paper, 31.2 × 23.5, Tate Britain

Figure 149: Three Wise Monkeys, 1617 rebuilt 1818, Tōshō-gū Shinto shrine, Nikkō, Tochigi prefecture, Japan

Figure 150: Holman Hunt, *The Light of the World*, 1851-3, 125.4 × 59.7, Keble College, Oxford

Figure 151: Piero della Francesca, *Madonna della Misericordia*, part of a polyptych commissioned in 1445, 1460-1465, oil and tempera on panel, 330 × 273, Museo Civico, Sansepolcro

Figure 152: Edward Burne-Jones, *Troy Triptych*, 1872-1898, unfinished, 273 × 294.6, Birmingham Museums and Art Gallery

Figure 153: Michelangelo Buonarroti, *Delphic Sybil*, 1509, fresco, 350 × 380, Sistine Chapel ceiling, Vatican City

Chapter 1: Darwin and the Visual Arts

Charles Darwin (1809-1882) and certain artists of mid-Victorian England changed the way we see the world. Darwin's influence has been discussed extensively although the impact he had on how we see and represent the world has not been as closely studied. Fine art in the nineteenth century is often analysed in order to understand the way it reflects society but conversely, although hard to quantify, I consider how art might also have helped change society. By examining Darwin's ideas and their undoubted influence, it is possible to find similar themes addressed by artists, often in advance of the publication of Darwin's work. This indicates that there were cultural changes taking place that both Darwin and artists were sensitive to and which they helped to perpetuate. This thesis will consider the concept of change and the nature of change in the context of aestheticism in the visual arts and Darwin's work on beauty. I examine a number of well-known artworks to show how they might have influenced changing views about beauty, class, gender and our origins in the light of Darwin's well-documented influence.

Modernity is often associated with change as Charles Baudelaire (1821-1867) made clear when he wrote: 'By "modernity" I mean the ephemeral, the fugitive, the contingent, the half of art whose other half is the eternal and the immutable'.[1] Some critics consider modern art to have started with French Impressionism and English art has been regarded as irrelevant to any discussion of modernity.[2] English and French art influenced each other but English art had gone through two revolutionary changes before the first Impressionist exhibition in 1874. The first was the radical work of the Pre-Raphaelites, particularly between 1849 and 1854 and the second was the emergence of the Aesthetic Movement, starting with Rossetti's *Bocca Baciata* of 1859. Each country had its own unique artistic and scientific endeavours, cultural influences and social changes. In England, for example, Darwin's work had a direct impact on popular thinking regarding the basis of religion and our origins. This impact brought about change by unanchoring conventional assumptions regarding categories, origins and progress, that is—who we are, where we come from and where we are going. There were also many international influences; Richard Kendall, for example, argues that the publication of Darwin's ideas in France was an important influence on the French Impressionists.[3]

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1 Charles Baudelaire, *The Painter of Modern Life and Other Essays*, trans. by Jonathan Mayne (London: Phaidon, 1995, first published 1863), p. 13, IV Modernity.

2 This issue is discussed by Paul Barlow: 'recent critical convention has denied the very possibility of "British modernity" in art.', Paul Barlow, 'Millais, Manet, Modernity', in *English Art 1860-1914: Modern Artists and Identity*, ed. by David Peters Corbett and Lara Perry (Manchester: Manchester University Press, 2000), pp. 49-63 (p. 52).

3 Richard Kendall, 'Monet and the Monkeys: The Impressionist Encounter with Darwinism', in *Endless Forms: Charles Darwin, Natural Science and the Visual Arts*, ed. by Diana Donald and Jane Munro (London: Yale University Press, 2009), pp. 293-318 (p. 293).

Aims and Approach

I start by looking at how Darwin's ideas influenced society and I consider topics relevant to both Darwin and art where change was taking place, such as the role of nature, sexuality, race and class. The central topic that unites and illuminates the others is beauty. I examine what Darwin wrote about beauty and consider what impact this might have had on art and society. I then consider a wide range of well-known artworks to see if they contain similar themes to those explored by Darwin. I base my analysis on the artwork as a unique cultural artefact and on the critical reaction at the time. The interpretation that results from this approach is particular to each artwork and its diverse meanings and draws attention to the complexity of the interacting themes it uncovers.

I use the physical image as an anchor to provide a way of examining cultural change.[4] The image itself, as a collection of colours and marks on a flat surface, is ambiguous but an interpretation can be used to check a textual analysis just as a measurement can be used to check a scientific theory. The difference is that measurements are repeatable within a statistically calculable error range but interpretations depend on cultural assumptions. I select images that uncover significant cultural themes rather than those that simply illustrate Darwin's text. Finally, I aim to show that science and art are connected by many topics, such as progress and materialism, rather than by overt dialogue. The documented dialogue between Darwin and artists and art critics is relevant but not significant in terms of the aims of my research.

My approach is cross-disciplinary as it examines works of art in the context of a detailed scientific analysis of Darwin's ideas. This examination shows how both Darwin and the artists were influenced by similar cultural changes and how they both helped bring them about. My aim is to demonstrate that artworks were closely linked with ideas that were also being discussed by scientists although often in very different ways. The difficulty of linking such disparate fields as science and art is indicated by David Amigoni who wrote:

> It is not always easy to plot a new sense of the subtle ideological connections that linked dispersed cultural discourses in the nineteenth century on the basis of existing cultural-historical maps.[5]

For example, it is seductively easy to link evolution with ideas of progress such as images of Victorian technological developments and scenes of empire building. However, Darwin realised, as did other commentators, that his theory of evolution undermines the idea of progress. On close examination, many broad cultural themes, such as progress, were

[4] My use of the term 'culture' is defined on page 42. The word 'page' refers to pages in this thesis and 'p.' or 'pp.' refers to other documents.

[5] *Charles Darwin's the Origin of Species: New Interdisciplinary Essays*, ed. by David Amigoni and Jeff Wallace (Manchester: Manchester University Press, 1995), p. 123.

debated at the time and require a more subtle analysis. These debates have often been analysed and so I start with relevant visual images and use the history of their reception as an indicator of their cultural impact in order to avoid repeating this research work. I determine if an artwork is relevant on the basis that either it provoked a strong critical reaction or it illustrates a point in my argument.

As mentioned, there is one broad theme that is used to link Darwin and the artists and that is beauty. This theme was chosen because it lies at the centre of Darwin's theory of sexual selection and he published his ideas at a time when aesthetic values in art became dominant. My aim is to show why beauty became such an important topic for both scientists and artists during the 1860s and 1870s. My starting point is Darwin's work and the chapters of this thesis deal with his developing ideas broadly chronologically, from his early ideas about nature in his *Journal* to his final paean to the earthworm.[6] Each chapter then considers artworks and images produced by artists who worked in England between the 1850s and the 1880s, a key period during which *Vestiges* was published in 1844, *Origin* in 1859 and *Descent* in 1871.[7] The artworks and images are selected to show how artists were involved with similar themes to Darwin, such as female selection and our hairless bodies. They are discussed alongside an analysis of Darwin's ideas to show how the two are subtly interconnected. The accumulation of these connections shows that a bond existed, which is not a dialogue between science and art, but an illustration of common cultural themes that influenced both and were influenced by them.

The benefit of using visual images is that although they appear to speak clearly they say nothing. Their reception changes over the years but the image remains. To avoid a retrospective interpretation I therefore take the original critical reaction and compare Darwin's text with the critics' text through the medium of the image. Images were sometimes interpreted as advancing or representing certain ideas, often by the

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6 Charles Darwin, *Narrative of the Surveying Voyages of His Majesty's Ships Adventure and Beagle, between the Years 1826 and 1836, Describing Their Examination of the Southern Shores of South America, and the Beagle's Circumnavigation of the Globe. Journal and Remarks. 1832-1836*, 3 vols (London: Henry Colburn, 1839). The popularity of Darwin's volume resulted in it being published separately in August 1839 as *Journal of Researches into the Geology and Natural History of the Various Countries Visited by H.M.S. Beagle.* The best-known edition was the second, first published by John Murray in 1845 and this is referred to in this thesis as *Journal*. The first version with the modern title *The Voyage of the 'Beagle'* was not published until 1905. The other book mentioned is Charles Darwin, *The Formation of Vegetable Mould, through the Action of Worms*, 1st edn (London: John Murray, 1881).

7 Robert Chambers, *Vestiges of the Natural History of Creation*, 1st edn (London: John Churchill, 1844), from now on *Vestiges*. In James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (London: University of Chicago Press, 2000) he argues that the publication of *Vestiges* was the point at which evolution gained a 'pivotal role in the public arena' (p. 2). Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, 1st edn (London: John Murray, 1859), from now on *Origin*. Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, 1st edn, 2 vols (London: John Murray, 1871), from now on *Descent*.

artist and occasionally by critics but any interpretation needs to be handled with care as an image is inexhaustible and gives rise to many possible readings. I place a higher value on the original critical reactions than current interpretations as they provide an insight into the ideological concerns at the time. The reactions can themselves be interpreted in many ways and I select those that highlight Darwin's ideas and our current views of Victorian ideology.

My approach is to start with the references to beauty in Darwin's books, publications, notes and correspondence as this material is less well known than that of the artists. The consequences and implications of his theories, particularly that of sexual selection, are then considered alongside the paintings and illustrations of a number of leading artists. The key period is from Rossetti's *Bocca Baciata* (1859) to Rossetti death on 9 April 1882, which was followed ten days later by Darwin's death. I consider earlier works, such as Darwin's *Journal* and notebooks as they provide an insight into his personal views about beauty and nature and provide a link with the ideas of the Pre-Raphaelites. I look at some publications that followed Darwin's death, particularly Max Nordau's *Degeneration*. Nordau identified the work of the Pre-Raphaelites as the earliest form of degenerate art in England based on what he claimed were 'Neo-Darwinian' principles.[8] This creates a form of closure around an interplay of complex influences that took place during Queen Victoria's reign from 1837, the year Darwin started work on his evolutionary theory, to 1901, a few years before George Frederic Watts (1817-1904) completed *Evolution*.

Art-historical interpretations of Darwin's ideas have often been concerned with images that illustrate his text, either directly or indirectly. These include the representation of apes and cavemen, ethnographic illustrations, botanical and ornithological studies or ancient landscapes with dinosaurs and pterodactyls.[9] Instead, I look for the triggers that brought about cultural change, particularly the overlap between what was written by scientists, artists and critics on topics such as beauty, nature, gender, race, idealization and degeneration. These new ideas changed the way people thought as they undermined existing assumptions about what it meant to be male or female, black or white, rich or poor, and they proposed a physical explanation for spiritual attributes.

One advantage of looking at such disparate areas as science and art is that it provides a new way of analysing cultural change, as only the major changes affected

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8 The meaning of the terms Darwinism and Neo-Darwinism has changed substantially over the years and it could, for example, be argued that Darwin was not fully Darwinian as the term was used by its creator Thomas Huxley, see Thomas Henry Huxley, 'Darwin on the Origin of Species', *Westminster Review,* 17:2 (April, 1860), 541-70 (p. 569), particularly regarding saltation (see Appendix 4: Glossary).

9 Diana Donald and Jane Munro, *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (London: Yale University Press, 2009) contains valuable contributions of this type.

both groups. The way we think and see the world is biased by implicit assumptions based on our nature and nurture, and cultural change sometimes provides a revealing insight into these preconceptions. By considering a historic period that is remote from ours but sufficiently close to be comprehensible, these preconceptions are easier to demonstrate. Questions such as, ‘Are black and white people the same species?’ and ‘Are women as intelligent as men?’ were being seriously addressed at the time. Although it might appear peripheral, beauty was a central topic as it overlapped many of these areas and so became a fulcrum around which the arguments revolved.

For Darwin, one form of beauty resulted from sexual selection, and gave rise to many racial and gender differences but for his opponents it proved that natural selection was wrong. The idea of beauty lay at the heart of many contentious debates and yet it could be seen as an aspect of fashion and an attribute represented by desirable consumer objects, such as blue china and peacock feathers. Middle-class aspirations could therefore be objectified in a way that associated them with progressive ideas without the need to coalesce those ideas into radical action. Beauty became the new religion in the sense that it provided an intangible goal to aspire to and it enabled feelings to be channelled into positive action. It also enabled subversive new ideas, such as female sexuality, to be discussed openly although indirectly. Beauty has been associated with moral goodness since classical antiquity but Darwin saw bodily beauty resulting from sexual preference and this decoupled it from moral worth. This decoupling freed beauty to become an attribute that could be associated with both good and bad characteristics, although the idea of ‘evil beauty’ was not new and is embodied in many Western myths such as that of Circe and Medusa. Darwin was part of a reformulation of the visual signifier in determining the signified, that is, he changed the way people thought so that symbols took on new meanings.

It is important to mention two aspects of Darwin’s work that were widely dismissed at the time and which are still rejected or treated with caution. First, Darwin took it for granted that other animals experience similar feelings to humans, including the recognition of beauty. He saw humans as just another animal and so if we accept that other humans have similar experiences to our own he saw no logical reason to exclude other animals. He did of course recognise that in many areas humans have much more highly developed capabilities. Secondly, he thought sexual selection involved beauty and choice and was an important evolutionary mechanism. At the time, and sometimes today, it was rejected or regarded with suspicion and caution and over the years many attempts have been made to show that it is a form of natural selection. Sexual selection is a much more shocking idea than natural selection as it bases evolutionary change on fickle

choice and can bring about changes that reduce fitness by making the individual less well adapted to its environment.[10]

In the 1850s, the Pre-Raphaelites represented the detail of nature and distorted space by flattening represented objects onto the picture plane.[11] They often represented subjects with a serious moral message or a strong narrative element. This changed in the 1860s to a belief, by artists such as Rossetti, Leighton, Whistler, Edward Burne-Jones (1833-1898) and Albert Moore (1841-1893), that the role of art was not to change society or tell a story but to create beautiful objects.[12] The beauty of the abstract forms of plants and animals also became an inspiration for designers and artists such as David Ramsay Hay (1798-1866), Christopher Dresser (1834-1904), and William Morris (1834-1896), and it played a key role in the work of artists and commentators such as John Ruskin (1819-1900), Algernon Charles Swinburne (1837-1909) and Walter Pater (1839-1894).

The term 'aesthetic' came into widespread use although not specifically as the result of an artistic movement. As Prettejohn wrote:

> Many attempts have been made to identify an artistic movement that would correspond to, or perhaps account for, the sudden prominence in late nineteenth-century English criticism of the term 'aesthetic'[13]

In order to understand the interest in the aesthetic I look first, in Chapter 2, at the specific issues Darwin raised about the attributes of beauty in humans, that is, our secondary sexual characteristics.[14] I consider how his ideas were linked to his theory of sexual selection and what he wrote about sexual characteristics and how and why they developed. Darwin gave a new credibility to ideas about evolution that were popularised in *Vestiges*. *Vestiges* was published anonymously, which undermined its scientific credibility, but Darwin was a respected scientist and the publication of *Origin* in 1859 brought about a more serious questioning of traditional ideas. Nevertheless, as James

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[10] By defining 'environment' to include mate selection then sexual selection can be seen as part of natural selection but Darwin saw them as distinct.

[11] For a detailed analysis of the style and techniques used by the Pre-Raphaelites see Elizabeth Prettejohn, *The Art of the Pre-Raphaelites* (London: Tate Publishing, 2000), pp. 87-134.

[12] For a summary of aims, see Elizabeth Prettejohn, *Art for Art's Sake: Aestheticism in Victorian Painting* (London: Yale University Press, 2007), pp. 1-9. The artists concerned did not see themselves as part of a close-knit movement like the early Pre-Raphaelite Brotherhood.

[13] *ibid*., p. 1. A search of the British Periodicals database reveals that the use of the word 'aesthetic' increased from 1,862 references in the 1860s to 4,790 in the 1870s. It remained high until 1909 when it dropped significantly and remained low until 2000. Since then its use has continued to climb and in 2010 it reached 735 for the year, almost the same as 1881, the peak year for the nineteenth century, when it reached 742. The term 'aestheticism' peaked in 1881 and 1882 when it reach 80 for each year. The term 'aesthete' was almost unused until 1881 when it was suddenly used 100 times, after which its use slowly declined. The sudden increase was probably because of Gilbert and Sullivan's opera *Patience; or, Bunthorne's Bride,* which satirized the aesthete Bunthorne and was first performed on 23 April 1881.

[14] From now on I often use the abbreviation 'sexual characteristics' to refer to secondary sexual characteristics, that is, those features that distinguish the two sexes of a species that are not directly part of the reproductive system (the primary sexual characteristics).

Secord has pointed out, *Vestiges* played an important role by raising significant questions about our origins in the wider population. Our animal origins were debated immediately following its publication in 1844 although Darwin did not publish his analysis of human origins until 1871 with *Descent*. Surprisingly, given the title, over two-thirds of *Descent* concerned sexual selection.[15] Finally, in *Expression* (1873) he argued that those qualities, such as the appreciation of beauty, that appear to be uniquely human can be found, if sometimes only in a limited form, in other animals.[16]

Chapters 3 to 6 are each structured in a similar way with each chapter covering a single topic, namely nature, the body, perfect beauty, and the ugly, grotesque and degenerate. Each chapter is sub-divided into themes that have been selected to illustrate the synergy between Darwin's work and that of artists of the period. Each theme is represented by artworks that have been selected to make particular points relevant to the theme. A great deal of research has been published about most of the artworks and to avoid repetition only the Darwinian aspects are considered. This Darwinian perspective involves considering the implications of Darwin's work with respect to each image, the history of its production and its critical reception.

Chapter 3, 'Nature's Beauty' looks at the ways in which Darwin saw and described nature and how this related to a wide range of artists. In his *Journal*, he combined detailed scientific observation with a love of beauty and discussed how our memory provides a subjective view of nature. It is as if he were taking an 'inner standing point' with respect to nature rather than his normal objective observational stance.[17] We see a similar change between Millais's early paintings and his *Autumn Leaves* (1856, Figure 1) in which there is a subjective stance and a nostalgic mood. In *Origin,* Darwin's ideas undermine a world of fixed forms and species and create the visual image of a world in flux as one animal changes into another. A similar rejection of a clearly defined world of precise forms is found in Whistler's Nocturnes including *Nocturne: Blue and Gold: Old Battersea Bridge* (1872-77, Figure 2). Many people found this approach to nature unacceptable, for example John Ruskin who, although he treated Darwin as a gentleman and Whistler as a 'coxcomb', reacted in a similar way to their work—he thought they were both attacking the divinely created, and therefore fixed, forms of nature. The charge that was levied was that they were materialists but this was such as serious accusation that it was often couched in other terms. Materialism was a belief that the material world is all that there is; it is a rejection of God, divine forces and the soul

[15] 578 of 828 pages (70%) are devoted to sexual selection.
[16] Charles Darwin, *The Expression of the Emotions in Man and Animals* (London: John Murray, 1872), from now on referred to as *Expression*.
[17] *Dante Gabriel Rossetti: Collected Poetry and Prose*, ed. by Jerome McGann (New Haven, CT and London: Yale University Press, 2003), xxv-xxviii discusses Rossetti's idea of the 'inner standing point'.

and it was thought by its supporters to bring reason and certainty into a subjective, spiritual world. However, we shall see that the opposite was the case; the old beliefs brought absolute certainty and fixed ways of categorizing and dealing with the world. Darwin's explanations were based on observation rather than an appeal to authority and they unanchored previous convictions and left a world in which everything is relative.

As an example of the fluidity of previously distinct categories, in the first edition of *Origin* Darwin described the metamorphosis of a bear into a whale, creating an image of the strangeness and grotesqueness of nature that was reflected in the half bear and half wolf in Whistler's *Symphony in White, No. 1: The White Girl* (1861-2, Figure 3).[18] This painting was also seen to refer to a new vogue for Spiritualism, which included amongst its advocates artists like Whistler and scientists such as Alfred Russel Wallace (1823-1913), co-discoverer of natural selection. Darwin's ideas became popular and were referenced in the press through cartoons that included a series in *Punch* by Edward Linley Sambourne (1844-1910) called 'Designs after Nature'. One illustration from this series was 'Grand Back-Hair Sensation for the Coming Season' (1 April 1871, Figure 4). The fashions caricatured by Sambourne reflected not just the idiosyncrasy of fashion and evolutionary change but also the deeper idea that beauty itself is a form of fashion encoded over generations of selection.

Chapter 4, 'Body's Beauty' is about the representation of the human body and it looks at the art of Rossetti, Watts and Leighton in the light of what Darwin wrote about the female selection of male beauty, the beauty of our hairless bodies, the male beard, beauty and race and beauty and class. Rossetti's *Bocca Baciata* (1859, Figure 5) was completed the same year as *Origin* and relates to female sexual selection. Darwin argued at length that females must be involved in the selection of their mates, otherwise, male sexual characteristics would not have developed. This ran counter to the Victorian idea of woman as the passive daughter, wife and carer at home and it links Darwin with Rossetti's differently motivated but similar ideas.

Watts's *A Study with the Peacock's Feathers* (1865, Figure 6) takes a particular approach to the representation of the nude at a time when it was not in favour in the art world, but when our hairless bodies were important evidence for Darwin's theory of sexual selection. Leighton's *Golden Hours* (1864, Figure 7) was described as 'effeminate' yet the man has a beard, a conventional sign of masculinity. However, Darwin explained that the beard was a result of generations of female selection. Masculine characteristics, such as the beard, therefore have dual significance, both as a signifier of masculinity but also of female power. Rossetti's *The Beloved* (1865-6, Figure 8) contains one of the few

[18] The painting was referred to as *Symphony in White, No. 1* retrospectively and by implication after Whistler named *Symphony in White, No. 3*.

representations of a black person during a decade when America was fighting a civil war partly over slavery. Darwin was always very clear that all humans are a single species and that many racial differences are explained by different, local views about beauty. Leighton's *Daedalus and Icarus* (*c*. 1869, Figure 9) is concerned with the myths of Western society, the representation of social distinctions, male beauty and its link to class and the limitations of human endeavours.

Ideal or perfect beauty has intrigued artists and philosophers since the ancient Greeks. Chapter 5, 'Perfect Beauty' looks at how these ideas were being changed by the latest developments in science and the arts. I consider perfection in nature, the work of the design reform movement and the ways in which these interacted with Darwin's ideas. Christopher Dresser's 'Leaves and Flowers from Nature No. 8' (1856, Figure 10) is looked at as an expression of the design ideas of the period. The design reform movement looked beyond natural forms to the underlying patterns of nature and their theoretical approach was related to Hay's 'Science of Beauty' and Richard Owen's archetypes.[19] Although these ideas conflicted with Darwin's soon to be published theory they continued to provide an important source of design ideas during the nineteenth century.

Many people believed the classical nude represented the highest form of beauty and Albert Moore's *A Venus* (1869, Figure 11) was seen by critics to have been based on one of these classical ideals, the *Venus de Milo*. In *Descent*, Darwin used an earlier icon, the *Venus de'Medici,* as his epitome of beauty and discussed how if all women looked like this then our need for variety would give rise to the exaggeration of certain features. The modifications made by Moore when creating his Venus are discussed with respect to the notion of ideal beauty and the need to maintain respectability in the light of Darwin's link between beauty and sexual desire.

Finally, in Chapter 6, 'The Ugly, Grotesque and Degenerate' I consider how Darwin described ugliness and whether it is the opposite of beauty, a category in its own right or, as some have argued, an intrinsic part of beauty. Most critics considered the figures in Millais's *Christ in the House of His Parents ('The Carpenter's Shop')* (1849-50, Figure 12) to be ugly and the reasons are discussed in the context of Darwin's views. A consideration of the ugly leads to the idea of the grotesque, a word that was elevated by Ruskin into a term of praise for artists aware of their finite limitations in an infinite world. The spirits in Millais's *Ferdinand Lured by Ariel* (1850, Figure 13) were described as grotesque and the reasons Millais created this work are considered with respect to mimicry and deception in the work of Darwin and Wallace. At the end of the century,

[19] Richard Owen (1804-1892) was an English biologist, comparative anatomist and palaeontologist who coined the word *Dinosauria* and established the Natural History Museum.

Watts produced a grotesque image that commented directly on Darwin's ideas: *Evolution* (1898-1904, Figure 14). This painting was one of the few works of fine art to tackle the subject directly.

Many associated evolution with progress and this implied both the possibility of improvement and of degeneration. Degeneration is discussed in relation to chance and Burne-Jones's *Wheel of Fortune* (1883, Figure 15). Burne-Jones was described by Sidney Colvin as creating 'an unscientific and uncritical No-man's land of beauty and enchantment' but his work and Darwin's ideas both clearly expressed the arbitrariness of nature, which in Burne-Jones's case was described by Colvin as 'the quintessence of nature when nature is loveliest'.[20] Max Nordau published *Degeneration* in English in 1895 and brought together many concerns about the move away from naturalism. His primary target for criticism amongst art movements was the Pre-Raphaelites and he singled out Rossetti as an example of what he called mystical thinking. Rossetti's *The Blessed Damozel* (1875-9, Figure 16) is considered with respect to Nordau's ideas of degeneration and how they relate to Darwin's theory of transmutation. Finally, Darwin's idea of gradual evolutionary change was illustrated by Sambourne in his cartoon 'Man is But a Worm' (6 Dec. 1881, *Punch*, Figure 17) and the associated idea of degeneration in an illustration he drew for Charles Kingsley's *The Water-Babies: A Fairy Tale for a Land-Baby* (1898, Figure 18).

Although Darwin wrote a great deal about beauty, it is spread throughout his notebooks, publications and correspondence and so for the convenience of the reader the key extracts have been gathered together in Appendix 1. There is also a summary of Darwin's theory of natural and sexual selection and competing theories of beauty in Appendix 3. Appendix 4 provides a glossary of relevant terms in genetics. The Appendices are provided for the reader's convenience and are not part of this thesis.

The Dialogue between Art and Science

In the mid-Victorian period, the gap between science and art was narrower than it is today, as is indicated by, for example, Prince Albert reading the best seller *Vestiges* to Queen Victoria each afternoon.[21] The latest evolutionary theories had an immediate impact on cultural life. In particular, the religious controversies they stirred up are well recorded and have been extensively analysed. The periodicals of the day played an

[20] Sidney Colvin, 'English Painters of the Present Day', *The Portfolio* (January, 1870), 1-6, 16-23, 32-38, 80-86 (pp. 18-19).

[21] Secord, *Victorian Sensation* (2000), p. 168. The reading public was also expanding; see Jonathan Rose, *The Intellectual Life of the British Working Class* (London: Yale University Press, 2002), p. 21 about how subscription libraries changed the lives of artisans and mechanics.

important role in bringing together scientists and artists and creating a debate between them, and their broad cultural themes and general readership ensured that this debate took place across the reading classes and was not limited to a few specialist magazines.[22] The popularity of this approach is shown by the range and readership of these periodicals; nine of them had a total readership of over 150,000 spread across a wide spectrum of religious and political beliefs.[23] All these magazines featured the latest scientific findings alongside articles on art, philosophy and poetry and they provided a forum for both scientists and artists to argue their ideas before a broad Victorian audience. The views were often phrased in terms of metaphor and their aim was to provide understanding or even give meaning to an individual's life. This is particularly true of popular writers, such as John Ruskin, who were writing to educate a broad audience. The mainstream daily papers also had an important role to play and they would review the latest scientific developments.[24]

My approach includes the textual analysis of relevant books and articles in these and other publications as well as the quantitative analysis of word usage based on the new Google Ngram database. This analysis of word usage to illustrate cultural change is a new discipline called ‘culturomics’ and it provides a range of indicators such as the number of references made to one public figure compared with another or the sudden use of a new term.[25] Culturomics has limitations as it is based only on books, not articles, periodicals or newspapers and certainly not on the spoken word. In addition, a single work can be extremely influential yet statistically add very little to the usage of a word.

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22 Alvar Ellegård, *Darwin and the General Reader: The Reception of Evolution in the British Periodical Press, 1859-72* (London: University of Chicago Press, 1990) provides an excellent and detailed analysis of the popular reception to Darwin’s ideas.

23 The following is taken from the 115 daily, weekly, monthly and quarterly magazines listed by *ibid*., pp. 368-84. The *Athenaeum* (circulation 15,000) was a politically and religiously neutral magazine with a highbrow readership, *Blackwood’s Magazine* (circulation 10,000), a politically conservative magazine with neutral religious views and a middlebrow readership, *Chambers’s Journal* (circulation 80,000) was politically and religiously neutral and had a middlebrow readership, *Contemporary Review* (circulation 4,000) was politically liberal and low church and had a highbrow readership, *Edinburgh Review* (circulation 7,000) was politically liberal with a highbrow readership, *Fortnightly Review* (circulation 3,000 in 1864-9) had a general readership and politically liberal bordering on radical views with a highbrow readership, *Macmillan’s Magazine* (circulation 20,000) was politically liberal and Broad Church with a middlebrow readership, *Quarterly Review* (circulation 8,000) had a general readership, was politically conservative and High Church with a highbrow readership and the *Westminster Review* (circulation 4,000) was politically radical, with neutral religious views and a highbrow readership. The circulation is for 1859-1863 unless otherwise stated. The UK population in 1861 was 29 million, under half what it is in 2012.

24 For example, 'Mr. Darwin on the Descent of Man', *The Times*, 7 April 1871.

25 The first paper describing the techniques was Jean-Baptiste Michel et al., 'Quantitative Analysis of Culture Using Millions of Digitized Books', *Science,* 331 (14 January 2011), 176-82. Google has published a searchable lexicon of one to five word phrases from 5.2 million books, about 4% of all books ever printed. This data can be used to graph the changing use of words and phrases over any period between 1800 and 2000. The interpretation of the results is fraught with problems particularly as guidelines for each discipline have not yet been published and there is a danger of over interpretation but the initial results indicate it could be an important tool when tracing cultural change.

However, it can be argued that if a work is influential it should give rise to other works that discuss the same topics and together these would result in a significant statistical change in word usage. Culturomics can also show the relative popularity of different authors such as Ruskin compared with Darwin although, as mentioned, frequency of usage does not necessarily correspond with influence. The term 'Charles Darwin' is referenced about twice as often as 'John Ruskin' between 1840 and 2000 (Figure 19) although this is briefly reversed between 1900 and 1908. Another bias is that there is an implicit assumption that all books have the same readership. It is possible that some subjects give rise to a large number of different books each with a small readership. All the figures are relative and are based on the percentage of the number of references to the total number of phrases analysed by Google each year. This means that although the absolute number of references to, for example, Darwin, is much higher in 2000 than 1925 the percentage of books referencing him is the same. It should be noted that the search is sensitive to the exact spelling and capitalization, so for example 'Rossetti' is referenced about three and a half times as often as 'Charles Darwin' in 1870 but 'Dante Gabriel Rossetti' is referenced about one quarter as often.[26]

I consider the dialogue between science and art because, as Gillian Beer argues, the traffic was two-way and 'not only *ideas* but metaphors, myths, and narrative patterns could move rapidly and freely to and fro between scientists and non-scientists'.[27] She cites the example of *The Poetical Works of John Milton,* the one book that Darwin always took with him when he was on HMS *Beagle*. One poem in the book is *Paradise Lost* in which Satan is tormented by Eve's beauty and her love of Adam, and he bemoans the fact that in Hell there is 'neither joy nor love, but fierce desire'.[28] The question of whether there is beauty without sexual desire is one that Darwin answered and the critics debated. Although Darwin does not use the term sexual desire, what he means by beauty is an appearance that has evolved to be attractive enough to appeal to a mate sufficiently strongly to facilitate procreation when there is a choice of mates of differing attractiveness. As procreation is essential for sexual selection to operate and as sexual characteristics are visual features, there is a necessary link between beauty, when applied to the attractive appearance of another member of the same species, and sexual desire.

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[26] All the results I provide are smoothed by averaging them over three years. The percentage of references each year is very low, about one in ten million two-word phrases is 'Charles Darwin' in a total corpus of about 500 billion words.

[27] Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*, 3rd edn (Cambridge: Cambridge University Press, 2009), p. 5.

[28] John Milton, *The Poetical Works of John Milton; Complete in One Volume* (London: Jones & Company, 1824), Book 4, p. 21, lines 508-9.

When discussing Darwin and evolution our language embeds our cultural assumptions in the connotations of words, the metaphors used and the associations that are taken for granted. Lakoff argues that metaphors are fundamentally conceptual rather than a linguistic device and that abstract thought is largely metaphorical and he goes on to say that our beliefs, thinking and actions are based on unavoidable, ubiquitous, unconscious and mutually inconsistent metaphors.[29] Social change therefore requires a change in the metaphors on which our thoughts, beliefs and actions are based. For example, Darwin's theory does not require any direction to variation or imply any idea of progress, but evolution is linked metaphorically with progress, as in 'survival of the fittest', and so, responding to this apparent connection, critics and theologians suggested alternative teleological accounts that re-introduced design, planning and progress.[30] Gillian Beer points out that the historical determinism of evolutionary ideas has dominated the last 150 years of thought. This is the view that we inherit the world at the pinnacle of its development and that all the past has, metaphorically, 'constantly aspired towards becoming our present'.[31] Darwin had an ambiguous attitude towards the idea of progress. In his notebooks, he firmly rejected the idea, but he could not escape the social convention that Europeans are more advanced. Although he refused to accept that our species is special, he did believe that some cultures are more advanced than others.[32]

It is hard to argue that the scientific method does not build upon already established facts and theories even though, as Thomas Kuhn (1922-1996) convincingly argues, this is by means of paradigm shifts that involve a change in the subjective values held by the scientific community.[33] As Darwin's case well illustrates, the social consequences of scientific ideas and the beliefs of scientists may delay change but the predictive power of a new paradigm, the repeatability of measurement and the falsifiability of scientific theories eventually wins over advocates. Science is not the pursuit of truth in a metaphysical sense but the formulation of laws and theories that will make falsifiable predictions.[34] Kuhn explains how the use of exemplars creates a shared language that

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29 George Lakoff, *Metaphors We Live By*, ed. by M. Johnson (Chicago and London: The University of Chicago Press, 2003), p. 272.

30 Peter Bowler, *Evolution: The History of an Idea* (London: University of California Press, 2009), pp. 216-23.

31 Beer, *Darwin's Plots*, 3rd edn (2009), p. 14.

32 For example, he wrote: 'It is absurd to talk of one animal being higher than another. — We consider those, when the intellectual faculties [/] cerebral structure most developed, as highest. — A bee doubtless would when the instincts were —', Charles Darwin, *Notebook B: Transmutation of Species* <http://darwin-online.org.uk/content/frameset?itemID=CUL-DAR121.-&viewtype=text&pageseq=1> [accessed 22 August 2012], p. 74.

33 Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: Chicago University Press, 1970), pp. 10-22.

34 Not all scientific theories are like the phlogiston theory or the luminiferous aether. Often a theory, such as Einstein's general theory of relativity does not replace the previous theory but both are used alongside each other. Newton's law of universal gravitation is still used to calculate orbital velocities as the use of Einstein's formulae only makes a significant difference as objects approach the speed of light.

defines a particular paradigm.[35] The visual equivalent of exemplars for the artist and the art historian are the artworks and visual images that create what Gombrich calls schemata, visual structures that are used to represent the world or the imagination.

A great deal of the analysis of Darwin's work presents it as a battle between science and religion but John Dewey (1859-1952) claimed that the Darwinian revolution was much more fundamental as it went to the root of what we mean by knowledge.[36] He asked where in a constantly changing world we could find the fixed categories and certainties on which to base knowledge. Erwin Panofsky (1892-1968) points out that the ancient Greeks observed seeds growing into plants and eggs growing into animals and each time 'this progressive organization does not cease until there is achieved a true final form, a τελὸς, a completed, perfected end.'[37] Aristotle gave the name ειδος, later translated by the scholastics as 'species', to the principle that ensured that a series of changes taking place in a world of constant flux resulted in the same, fixed final form emerging. Dewey explained that 'the classical notion of species carried with it the idea of purpose' and perfection and this made the world intelligible and underpinned science.[38] Darwin's provocative title *Origin of Species* therefore threatened to remove the basis of all science and all knowledge. It is this unanchoring of what previously gave certainty to knowledge that links Darwin and artists such as Whistler.

Any suggestion that behaviour is determined by our genes raises the 'nature versus nurture' debate. I have minimised any implication of determinism by treating our Darwinian 'instinct' for beauty as a bias or inclination that can be overridden by culture and individual preference. Darwin recognized that many aspects of beauty are concerned with culture and are therefore 'infinitely complex'.[39]

The Artist, the Critic and the Model

When considering art from a Darwinian perspective, there are culturally determined pressures and assumptions that influenced Darwin and artists and which they, in turn, helped change. In addition, Darwin's description of specific human secondary sexual characteristics, such as the beard and the naked body, give us an insight into how and

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35 Exemplars are the particular 'concrete problem-solutions that students encounter from the start of their scientific education', Kuhn, *The Structure of Scientific Revolutions* (1970), p. 187.

36 John Dewey, *The Influence of Darwin on Philosophy* (New York: Henry Holt and Company, 1910), p. 2. A prescient book given that from the early 1900s to the 1920s many biologists thought natural selection had been superseded by Gregor Mendel's (1822-1884) work on genetics, see Bowler, *Evolution: The History of an Idea* (2009), pp. 224-73, Chapter 7, 'The Eclipse of Darwinism: Scientific Evolutionism, 1875-1925'.

37 Erwin Panofsky, *Idea: A Concept in Art Theory*, trans. by J. Peake (Columbia: University of South Carolina Press, 1968), pp. 16-18.

38 Dewey, *The Influence of Darwin on Philosophy* (1910), pp. 9-10.

39 See page 48.

why they might have been used, rejected or symbolized by artists. In order to explain what Darwin called 'the feeling in any one man' he brought together a number of explanations for different types of beauty.[40] When looking at a member of the opposite sex a person may appreciate the beauty of specific sexual characteristics such as smooth skin, rounded posterior, long hair on the head, beard or skin colour. Some of these characteristics will be shared by all human beings and some will have evolved more recently and be racially distinctive. In addition, culture has a vital role to play as we can learn to appreciate characteristics through habit based on their value in society. This is one type of beauty but Darwin also recognized that this was combined with the beauty we find in colour and certain forms. Our experience and learning also combine these in unique ways for each person, giving rise to the 'feeling in any one man'.

Beauty resulting from sexual selection has two sides, the beautiful animal and the discerning viewer, and Darwin's theory of sexual selection makes it clear that both sides must evolve in tandem; if beauty is not appreciated then no selection will be made. It makes no sense to ask which came first as although taste drives the selection there must be some characteristic, colour or form that can be appreciated.[41] For a particular secondary sexual characteristic to spread across a group the taste for it must involve some substantial proportion of the group over many generations. In the case of sexual selection in humans, the characteristic might be a beard and the selector with taste would be a woman. Darwin also explained that both the characteristic and its appreciation are passed on to both sexes, although they are not necessarily expressed. He also pointed out that cultural pressures and fashions can override inherited characteristics and taste so that in a particular society women might prefer clean-shaven men. Darwin did not comment on culturally determined aspects of taste and beauty but looked for characteristics that varied between races, between men and women and between children and adults.

In the case of art, there is a third person, the artist who is needed to represent beauty, which could be an aspect of a person, landscape or object, or simply colours and forms. This does not mean that beauty is the sole object of art, but the representation of beauty was an important aim for a specific group of artists in the second half of the nineteenth century. These artists had to select a beautiful object or model or create

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40 Charles Darwin, *Notebook M: Metaphysics on Morals and Speculations in Expression* <http://darwin-online.org.uk/content/frameset?itemID=CUL-DAR125.-&viewtype=text&pageseq=1> [accessed 22 August 2012], p. 32. Darwin was reacting against the implications of an explanation in Joshua Reynolds, *Seven Discourses Delivered in the Royal Academy by the President* (London: T. Cadell, 1778), pp. 322-23, Discourse VII, 10 December 1776. See page 52.

41 Some modern geneticists believe that the initial characteristic is one favoured by natural selection and it is then exaggerated by sexual selection, see Malte B. Andersson, *Sexual Selection* (Chichester: Princeton University Press, 1994), p. 25.

beauty from their memory and imagination. The artworks they produced had to be appreciated by viewers who shared the same taste as the artist, and although we are all close genetically, our different experiences mean we have different tastes. The artist had to manipulate his or her representation of beauty to produce an artwork that satisfied certain conventions while breaking others and retaining a sufficient number of interested viewers to create positive criticism and a sufficient number of buyers.

The artist can be representing and combining any of the types of beauty described by Darwin—the beauty associated with line, colour and symmetry, the beauty associated with learning and culture and the beauty associated with sexual selection. In the latter case, artists were representing a subject that potentially invoked feelings of sexual desire and if these were to be regulated, certain artistic conventions had to be followed. When the nude became more acceptable in the 1870s, artists had to experiment with those conventions in order to find ways of representing the beauty of the body without invoking the feelings that Darwin said were the root cause of the lack of hair.

Literature Review

It is necessary to start with a warning—the literature on Darwin is vast.[42] As George Levine wrote: 'It is arguable that with the exception of Shakespeare, no figure in English culture has attracted more attention than Darwin' and many of the books and articles about him are relevant to art in the nineteenth century as they deal with ethics, philosophy and aesthetics.[43] This section is, therefore not intended to be a comprehensive guide but a summary of the way I tackled the literature and its relevance to my research area. I have divided the literature into groups for the convenience of the reader, although some works fall into multiple groups. The two main groups cover the science and the art and the third is the cultural connection between them.

I first considered Darwin's writings, his ideas, their historic context, the contemporary critical reaction and the recent analysis of his life and works. Second, I looked at the visual arts of the nineteenth century, mainly between 1859 and 1882, but including some works from the preceding and following decades. I considered what was written about them at the time and the recent art-historical analysis. My research also involved understanding the intersection between the two but there are fewer publications in this area. I considered various works, some written at the time about science and art and some written more recently about beauty and sexual selection, beauty in art and the connection between Darwin and art.

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[42] See Michael Ruse, 'The Darwin Industry: A Guide', *Victorian Studies,* 39:2 (Winter, 1996), 217-35 for an overview of the literature about Darwin. It has continued to grow since then.

[43] George Levine, 'Reflections on Darwin and Darwinizing', *Victorian Studies,* 51:2 (2009), 223-45 (p. 223).

Finally, the reason for investigating the connection between Darwin and art was to understand the nature of cultural change by looking at the influences and the influencers. The assumption was that both Darwin and the artists influenced cultural and social change and they were in turn influenced by each other. Beauty was the topic that connected them and it helped bring about change by raising questions about identity, the family, gender roles and racial and class differences. My approach to cultural analysis was to consider how Darwin's scientific ideas are relevant to the art rather than analysing the art from the point of view of a twenty-first century ideology. This made it easier to identify and isolate aspects of cultural change. In order to understand the culture and changes taking place, I reviewed books and periodicals on Victorian culture, cultural change and, more broadly, the nature and role of language and thought.

Darwin and Evolution

The first group of works reviewed was Darwin's published and unpublished notebooks, books, articles and correspondence. The most comprehensive collection of his works is available on the Darwin Online website, which includes the full text and scanned pages. His letters are available on the Darwin Correspondence Project website where about 15,000 letters are summarised and the full text of about half of these is available. A print edition of the letters is being published chronologically and will be completed by 2022. The works were searched for any relevant topic, such as beauty, attractiveness, taste and sexual selection and the relevant sections are quoted and summarised in Appendix 1. Darwin's life and works have been analysed in many different ways and I started with the most significant biographies.[44] Each provides a different perspective, for example, Gruber gives a detailed analysis of Darwin's notebooks, Bowler puts Darwin's evolutionary ideas into a contemporary context and Ellegård provides a comprehensive survey of the critical reception by the types of periodical and the beliefs of their readership.

[44] The principal biographies I used were Janet Browne, *Charles Darwin: Voyaging* (London: Pimlico, 2003), Janet Browne, *Charles Darwin: Power of Place* (London: Pimlico, 2003), Adrian Desmond and James Moore, *Darwin* (London: Penguin, 1991), Gertrude Himmelfarb, *Darwin and the Darwinian Revolution* (London: Chatto & Windus, 1996, first published 1959), Loren Eiseley, *Darwin's Century: Evolution and the Men Who Discovered It* (New York: Anchor Books, 1961), Howard Gruber, E., *Darwin on Man: A Psychological Study of Scientific Creativity* (London: Wildwood House, 1974), Peter Brent, *Charles Darwin: A Man of Enlarged Curiosity* (London: Arrow Books, 1983), John Bowlby, *Charles Darwin: A Biography* (London: Hutchinson, 1990), Randal Keynes, *Darwin, His Daughter & Human Evolution* (New York: Riverhead Books, 2001), Rebecca Stott, *Darwin and the Barnacle: The Story of One Tiny Creature and History's Most Spectacular Scientific Breakthrough* (London: Faber and Faber, 2003), *Darwin*, ed. by Philip Appleman (New York: W. W. Norton, 1970), Peter Bowler, *Charles Darwin: The Man and His Influence* (Cambridge: Cambridge University Press, 1996, first published 1990) and Ellegård, *Darwin and the General Reader* (1990).

In order to place Darwin's ideas and theories in context it is also necessary to consider eighteenth and nineteenth-century books about evolution and related subjects.[45] Recent works on evolutionary science help place Darwin's ideas within their historic context and explain their importance to modern science.[46] Understanding sexual selection is critical to appreciating Darwin's contribution to understanding beauty and a few books and articles explain its historic context and social significance.[47]

I interpret Darwin's ideas within the context and culture of the period by looking at what was written at the time. However, it is difficult to avoid the modern 'cult of Darwin' that sees him as a great scientist and reinterprets his writing in the light of the 'modern synthesis' of Darwinian evolutionary ideas mixed with Mendelian genetics. In some ways, Darwin was a typical Victorian gentleman, but many of his ideas are far-sighted even today. His materialism and objective scientific approach included a rejection of the Enlightenment idea of progress, and although his views often appear to be genetically deterministic, he had progressive views on women's education and took a strong stand against slavery.[48] He viewed the scientific enterprise as objective, a view that is rejected by some modern writers as it seems to limit human freedoms. They argue that if human

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45 Such works include Erasmus Darwin, *Zoonomia; or, the Laws of Organic Life* (London: J. Johnson, 1794), Jean-Baptiste Lamarck, *On Classification and Evolution, Extracts from Philosophie Zoologique, Ou Exposition Des Considérations Relatives À L'histoire Naturelle Des Animaux* trans. by Hugh Elliot (London: Macmillan, 1914), William Paley, *Natural Theology: Or, Evidences of the Existence and Attributes of the Deity*, 12th edn (London: J. Faulder, 1809), Thomas Robert Malthus, *An Essay on the Principle of Population or, a View of Its Past and Present Effects on Human Happiness; with an Inquiry into Our Prospects Respecting the Future Removal or Mitigation of the Evils Which It Occasions*, 6th edn, 2 vols (London: John Murray, 1826), Charles Lyell, *Principles of Geology: Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes Now in Operation*, 2nd edn, 3 vols (London: John Murray, 1833), Chambers, *Vestiges*, 1st edn (1844), Herbert Spencer, *The Principles of Biology*, 2 vols (London: Williams and Norgate, 1864), St. George Mivart, *On the Genesis of Species* (New York: D. Appleton, 1871), Thomas Henry Huxley, *Evidence as to Man's Place in Nature* (New York: D. Appleton and Company, 1863) and Alfred Russel Wallace, *Darwinism; an Exposition of the Theory of Natural Selection with Some of Its Applications* (London: Macmillan and Co., 1889).

46 Andersson, *Sexual Selection* (1994), Robin Baker, *Sperm Wars: Infidelity, Sexual Conflict and Other Bedroom Battles* (London: Fourth Estate, 1996), Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 2006) and other works, Jacques Monod, *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology* (London: Collins, 1972) and many articles including K. Grammer et al., 'Darwinian Aesthetics: Sexual Selection and the Biology of Beauty', *Biological Reviews,* 78:3 (2003), 385-407, Randy Thornhill and Steven W. Gangestad, 'Facial Attractiveness', *Trends in Cognitive Sciences,* 3:12 (1999), 452-60 and Devendra Singh, Peter Renn, and Adrian Singh, 'Did the Perils of Abdominal Obesity Affect Depiction of Feminine Beauty in the Sixteenth to Eighteenth Century British Literature? Exploring the Health and Beauty Link', *Proceedings of the Royal Society B: Biological Sciences,* 274:1611 (2007), 891-94.

47 Recent books on sexual selection include Helena Cronin, *The Ant and the Peacock : Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991), Matt Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (London: Penguin, 1994) and Geoffrey Miller, *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (London: Vintage, 2001) and there is a large and growing body of research into the evolutionary basis of physical beauty that is discussed later.

48 Adrian Desmond and James Moore, *Darwin's Sacred Cause: Race, Slavery and the Quest for Human Origins* (London: Penguin Books, 2010).

nature is determined by our genes then we are not born free but with inherent restrictions on our potential and therefore our choices. An alternative view, proposed by John Locke, is that we are born with minds that are like a blank slate and with the right upbringing can achieve anything. We are certainly born with particular brain structures, such as a visual cortex, and everyone has a limited short and long-term memory and restrictions on the complexity of ideas we can process. These restrict our abilities but it is not clear to what extent they act to constrain our thinking or limit our potential. Other animals have eyes sensitive to parts of the electromagnetic spectrum we cannot see, which raises the questions of what new colours they can see and what new forms of beauty? Our brains evolved to enable our ancestors to cope better with the natural world and their social environment but there is no reason why they should be capable of fully understanding the complexity of the world at an abstract level. However, one aspect of our limited abilities appears to be a failure to see our limitations. Perhaps, as Wittgenstein said, if we cannot speak about something we must pass over it in silence.[49]

Darwin's Aesthetic Sources and Influences

We are fortunate in that we have many of Darwin's personal notebooks, which give us an insight into his private thoughts about beauty. The critical period during which these ideas developed was from 1838 to 1842, and although he made extensive notes during the *Beagle* voyage (1831-36) and often referred to the beauty and sublime nature of the scenery, he did not speculate about beauty itself.[50] The most important notebooks regarding beauty are 'Old & Useless Notes about the Moral Sense & Some Metaphysical Points' (1838-1840), 'Notebook M: Metaphysics on Morals and Speculations on Expression' (1838) and 'Notebook N: Metaphysics and Expression' (1838-1839) and to a lesser extent 'Notebook B: Transmutation of Species' (1837-1838) and 'Notebook C: Transmutation of Species' (February 1838-July 1838).

It is clear from Darwin's notes that he was familiar with a wide range of works on art and beauty, including those of Edmund Burke, John Casper Lavater, Joshua Reynolds, Archibald Alison, Dugald Stewart and Gotthold Ephraim Lessing.[51] His ideas

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[49] 'Wovon man nicht sprechen kann, darüber muß man schweigen.' Ludwig Wittgenstein, *Tractatus Logico-Philosophocus* (London: Routledge & Kegan Paul, 1971, first published in German in 1921), p. 151, §7.

[50] The conventional view, supported by Darwin's *Autobiography*, is that he developed his ideas on natural selection during the *Beagle* voyage. However, his notebooks make it clear that he did not write theoretically about natural selection until the end of the voyage and his ideas did not take the form of a coherent theory until about 1838. By 1844, he had written a 230-page book on natural selection that was ready for publication in the case of his death. He developed his theory of sexual selection to address an apparent weakness of natural selection to explain certain types of beauty.

[51] The particular works concerned with art that Darwin mentioned include Edmund Burke, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*, ed. by Adam Phillips, 2nd edn (London: Robert and James Dodsley, 1757), Charles Bell, *The Anatomy and*

(continued on next page)

developed between 1837 and 1840 and by the end of the period, he believed that animals are born with an innate sense of beauty as basic as smell or taste.

Darwin had a direct connection with artists and the art world. He had a personal relationship with a few artists such as Conrad Martens (1801-1878), the artist on HMS *Beagle*, the animal painters Joseph Wolf (1820-1899) and Briton Rivière (1840-1920) and the Pre-Raphaelite sculptor and poet Thomas Woolner (1825-1892) who sculpted a bust of Darwin in 1869. He also corresponded with photographer Julia Margaret Cameron (1815-1879) who took a portrait photograph of him in 1868, mathematician and photographer Charles Dodgson (1832-1898, pen name Lewis Carroll), and neurologist and clinical photographer Guillaume-Benjamin Duchenne de Boulogne (1806-1875).[52] He knew French-American ornithologist and painter John James Audubon (1785-1851) and had his portrait painted by a number of artists.[53] In 1882, Joseph Boehm (1834-1890) created the statue of him that was first unveiled in the Natural History Museum in 1885.

Darwin was concerned about using a proper scientific approach to everything he did and he studied closely the latest works on scientific method. He believed that nature was fully comprehensible in terms of laws based on forces and facts observable today and that no metaphysical or spiritual intervention is required. At the beginning of *Origin,* he quoted William Whewell:

> But with regard to the material world, we can at least go so far as this—we can perceive that events are brought about not by insulated interpositions of Divine

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Philosophy of Expression: As Connected with the Fine Arts, 3rd edn (London: Henry G. Bohn, 1844), Johann Caspar Lavater, *Essays on Physiognomy; for the Promotion of the Knowledge and the Love of Mankind, to Which Are Added, One Hundred Physiognomonical Rules. A Posthumous Work by Mr. Lavater, and Memoirs of the Life of the Author by G. Gessner*, trans. by Thomas Holcroft, 2nd edn, 3 vols (London: Symonds & Whittingham, 1804), Joshua Reynolds, *The Literary Works of Sir Joshua Reynolds, First President of the Royal Academy*, ed. by Henry William Beechey, 2 vols (London: T. Cadell, 1835), Archibald Alison, *Essays on the Nature and Principles of Taste* (Hartford, CT: George Goodwin, 1821, first published 1790), Dugald Stewart, *The Works of Dugald Stewart*, 7 vols (Cambridge: Hillliard and Brown, 1829), a Scottish philosopher and friend of Archibald Alison, and Gotthold Ephraim Lessing, *Laocoön. Nathan the Wise. Minna Von Barnhelm*, trans. by William Ross, ed. by William A. Steel (London: J.M. Dent, 1836). Other works include Charles Robert Leslie's *Life of Constable* (1843), Allan Cunningham's *Life of Sir D Wilkie* (1843), Francis Jeffrey's article on Archibald Alison's *Essays on the Nature and Principles of Taste* (1811), Robert Know's *Anatomy & Art* (1852) and Benjamin Robert Haydon *Autobiography* (1853). He also states in his correspondence that he read Kant and he owned and annotated an 1823 edition of Burke's essay on the sublime and the beautiful.

52 He also had his photograph taken by Karl Pearson, Maull & Polyblank, Maull & Fox, Ernest Edwards, Elliott & Fry, Lock & Whitfield and Herbert Rose Barraud.

53 Ellen Sharples (1769-1849) produced a chalk drawing in 1816, George Richmond (1809-1896) painted a watercolour portrait in the late 1830s, Thomas Herbert Maguire (1821-1895) drew a portrait in 1849, Samuel Laurence (1812-1884) drew a pastel and chalk sketch in 1853, Laura Russell (1816-1885) painted him in 1869, James Tissot (1836-1902) drew a caricature for Vanity Fair (30 September 1871), Walter Ouless (1848-1933) in 1875, Marion Collier (née Huxley) (1859-1887) drew a pencil sketch in 1878 and John Collier (1850-1934) painted a well-known portrait in 1881, which he copied in 1883.

power, exerted in each particular case, but by the establishment of general laws.[54]

Nineteenth-Century Art and Beauty

My other area of research was nineteenth-century art from the Pre-Raphaelites in 1849, through the Aesthetic Movement to the *fin-de-siècle*. I selected the eighteen artworks and images already mentioned on the basis that they highlight important aspects of Darwin's ideas and their cultural associations. The artworks and images became the starting point for further research into the contemporary critical response and the recent art historical analysis of the artists, styles and movements.[55] This reading list is indicative rather than definitive and further works are listed in the bibliography. The aim of the reading was to enable the artworks to be understood in the context of recent critical readings, particularly those that relate to science, Darwinism, evolutionary thought and sexual desire. The research also included aspects of decorative art as it related to science and design and the symbolism of representation based on generalised forms or archetypes.[56]

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54 Darwin, *Origin*, 1st edn (1859), p. ii.

55 There are many summaries of Victorian art including Prettejohn, *The Art of the Pre-Raphaelites* (2000), Prettejohn, *Art for Art's Sake* (2007), Tim Barringer, *Reading the Pre-Raphaelites* (London: Yale University Press, 1998), R. Bullen, *The Pre-Raphaelite Body: Fear and Desire in Painting, Poetry, and Criticism* (Oxford: Clarendon Press, 1998), *Art in Theory 1815-1900: An Anthology of Changing Ideas*, ed. by C. Harrison (Oxford: Blackwell, 1998), Michaela Giebelhausen, *Painting the Bible: Representation and Belief in Mid-Victorian Britain* (Aldershot: Ashgate, 2006), William Holman Hunt, *Pre-Raphaelitism and the Pre-Raphaelite Brotherhood* (London: Macmillan and Co, 1905), Phillip Prodger, *Darwin's Camera: Art and Photography in the Theory of Evolution* (Oxford: Oxford University Press, 2009), Alison Smith, *The Victorian Nude: Sexuality, Morality, and Art* (Manchester: Manchester University Press, 1996), *Exposed: The Victorian Nude*, ed. by Alison Smith (London: Tate Publishing, 2001), Kelly Hurley, *The Gothic Body: Sexuality, Materialism, and Degeneration at the Fin De Siecle* (Cambridge: Cambridge University Press, 1996) as well as books on particular artists such as Robyn Asleson, *Albert Moore* (London: Phaidon, 2000), Paul Barlow, *Time Present and Time Past: The Art of John Everett Millais* (Aldershot: Ashgate Publishing, 2005), G. K. Chesterton, *G. F. Watts*, facsimile edn (London: Duckworth, 1904), D. B. Dobbs, *Dante Gabriel Rossetti: An Alien Victorian*, ed. by J. Dobbs (London: MacDonald and Jane's, 1977), Richard G. Dorment and Margaret F. MacDonald, *James McNeill Whistler* (London: Tate Gallery Publications, 1994), *The Correspondence of Dante Gabriel Rossetti*, ed. by William Evan Fredeman, 9 vols (Cambridge: D.S. Brewer, 2010), *William Morris on Art and Socialism*, ed. by Norman Kelvin (Mineola, NY: Dover Publications, 1999), Linda Merrill, *A Pot of Paint: Aesthetics on Trial in Whistler V. Ruskin* (Washington, DC: Smithsonian Institution Press, 1992), E.R. Pennell and J. Pennell, *The Life of James McNeill Whistler*, ed. by J. Pennell, 5th edn (London: William Heinmann, 1911), Carol Jacobi, *William Holman Hunt: Painter, Painting, Paint* (Manchester: Manchester University Press, 2006). William Michael Rossetti, *Dante Gabriel Rossetti as Designer and Writer* (London: Cassell & Company, 1889), Colin Trodd and Stephanie Brown, *Representations of G.F. Watts: Art Making in Victorian Culture* (Burlington, VT: Ashgate, 2004),

56 David Brett, 'Design Reform and the Laws of Nature', *Design Issues,* 11 (1995), 37-49, David Brett, 'Drawing and the Ideology of Industrialization', *Design Issues,* 3 (1986), 59-72, Christopher Dresser, *The Art of Decorative Design* (London: Day and Son, 1862), Owen Jones, *The Grammar of Ornament* (London: Day and Son, 1856), Barbara Whitney Keyser, 'Ornament as Idea: Indirect Imitation of Nature in the Design Reform Movement', *Journal of Design History,* 11:2 (1998), 127-44, Michael Whiteway, *Christopher Dresser: A Design Revolution* (London: V&A, 2004), Christopher Frayling, *The Royal College of Art: One Hundred & Fifty Years of Art & Design* (London: Barrie & Jenkins, 1987), David Ramsay Hay, *The Science of Beauty, as Developed in Nature and Applied in Art* (Edinburgh and London: William Blackwood, 1856), David Ramsay Hay, *The Natural Principles of Beauty, as Developed in the Human Figure*

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What artists and other commentators wrote about beauty and aesthetics in the eighteenth and nineteenth centuries was important as it created a context for interpretation.[57] As we have seen, Darwin read a number of these sources. The contemporary responses were found in libraries and various online databases such as ProQuest British Periodicals. These contemporary works were read in conjunction with recent works on aesthetics, beauty and related subjects.[58]

Understanding Cultural Change

I use the term 'culture' to refer to the interactions between people, groups of people and their environment. It encompasses all human phenomena that are learned, that is, that are not purely the result of inheritance, although inherited traits can influence the way an individual learns from the environment. The term therefore includes belief systems, working practices, including the ways in which scientists and artists think and act, and activities from fashion to fine art. The reaction and interaction between groups is often verbal but can be visual or gestural. Cultural expression is based on learned categories, symbols and rules and the method of representation is often metaphorical. The literature

(Edinburgh: Blackwood, 1852) and David Ramsay Hay, *First Principles of Symmetrical Beauty* (Edinburgh and London: William Blackwood, 1846).

57 Some of the more important texts are Joshua Reynolds, 'The Idea of Beauty', *The Idler,* 82 (10 November, 1759), Reynolds, *Discourses* (1778), Burke, *Philosophical Enquiry*, 2nd edn (1757), Dionysius Longinus, *On the Sublime* (London: J. Watts, 1734), William Hogarth, *The Analysis of Beauty Written with a View of Fixing the Fluctuating Ideas of Taste* (London: W. Strahan, 1772, first published 1753), M. Victor Cousin, *Lectures on the True, the Beautiful, and the Good*, trans. by O. W. Wight (London: D. Appleton, 1854), B. R. Haydon, *Lectures on Painting and Design* (London: Longman, Brown, Green, and Longmans, 1844), Immanuel Kant, *Critique of Judgement* (Oxford: Oxford University Press, 2007), Frederic Leighton, *Addresses Delivered to the Students of The Royal Academy by the Late Lord Leighton*, 2nd edn (London: Kegan Paul, Trench, Trübner & Co., 1897), James McNeill Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus) <http://www.whistler.arts.gla.ac.uk/whis2003/journal/display/?jid=1045703200> [accessed 22 August 2012], James McNeill Whistler, *The Gentle Art of Making Enemies* (London: William Heinemann, 1904), many of the publications of John Ruskin collected together in John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), Mary Anne Schimmelpenninck, *The Principles of Beauty as Manifested in Nature, Art, and Human Character, with a Classification of Deformities* (London: Longman, Brown, Green, Longmans, & Roberts, 1859), John Addington Symonds, *The Principles of Beauty* (London: Bell and Daldy, 1857) and Joachim Winckelmann, *Essays on the Philosophy and History of Art*, trans. by George Henry Lodge, 3 vols (London: Continuum International, 2005).

58 Recent publications consider many aspects of historic works, such as Angela Leighton, *On Form : Poetry, Aestheticism, and the Legacy of a Word* (Oxford: Oxford University Press, 2007), Umberto Eco and Alastair McEwen, *On Beauty* (London: Secker & Warburg, 2004), Umberto Eco, *On Ugliness*, trans. by Alastair McEwen (London: Harvil *Secker*, 2007), Daniel S. Hamermesh, *Beauty Pays* (Princeton: Princeton University Press, 2011), Francis Haskell and Nicholas Penny, *Taste and the Antique: The Lure of Classical Sculpture, 1500-1900* (New Haven and London: Yale University Press, 1981), Wolfgang Kayser, *The Grotesque in Art and Literature*, trans. by Ulrich Weisstein (Columbia: Columbia University Press, 1981, first published 1957), Carolyn Korsmeyer, *Savoring Disgust: The Foul & the Fair in Aesthetics* (Oxford: Oxford University Press, 2001) and Winfried Menninghaus, *Disgust: The Theory and History of a Strong Sensation* (Albany, NY: State University of New York Press, 2003).

that is relevant to my particular approach is from linguistics, philosophy and artificial intelligence rather than anthropology.[59]

In order to understand nineteenth-century culture and the way it changed I refer to various works of social history and aspects of Victorian culture.[60] They were selected to highlight the relationship between the beliefs of particular social groups and ideas found in science or expressed in art.

There are also books that relate directly to my research area. Gillian Beer explored the ways in which Darwin's ideas can be interpreted as literary plots, Jonathan Smith looked at the illustrations used by Darwin and Gowan Dawson examined Darwin and Victorian respectability.[61] These are three key books to which I am greatly indebted as they helped me formulated my ideas. My approach differs in that I specifically look at artworks to evaluate the changing cultural climate in the light of Darwin's ideas and how their reception changed over time.

A number of writers have written more broadly on art and evolution, such as Ellen Dissanayake and Denis Dutton, who attempt to explain the origin of art in evolutionary terms, and there many writers who discuss Darwin and ethics.[62] The relationship between Darwin's work and visual culture is discussed in books such as Stephen Eisenman's

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59 For example, Lakoff, *Metaphors We Live By* (2003) and his other works, Steven Pinker, *The Language Instinct: How the Mind Creates Language* (New York: William Morrow, 1994), W. V. O. Quine, *Word and Object* (Cambridge, MA: The M.I.T. Press, 1960), L. Cavalli-Sforza, *Genes, Peoples and Languages* (London: Allen Lane, 2000), and Yuri M. Lotman, Jerry Leo, and Amy Mandelker, 'The Text within the Text', *Proceedings Modern Language Association,* 109:3 (1994), 377-84.

60 Some of the main texts used are R. Altick, *Victorian People and Ideas* (New York and London: W. W. Norton & Company, 1973), Walter E. Houghton, *The Victorian Frame of Mind: 1830-1870* (New Haven and London: Yale University Press, 1957), James Eli Adams, *Dandies and Desert Saints: Styles of Victorian Masculinity* (Ithaca, NY and London: Cornell University Press, 1995), Lynda Nead, *Victorian Babylon: People, Streets and Images in Nineteenth-Century London* (New Haven and London: Yale University Press, 2000), Daryl Ogden, *The Language of the Eyes: Science, Sexuality, and Female Vision in English Literature and Culture, 1690-1927* (Albany, NY: State University of New York, 2005), Jan Marsh, *Black Victorians: Black People in British Art 1800-1900* (Farnham: Lund Humphries, 2005), Secord, *Victorian Sensation* (2000), L. Strachey, *Eminent Victorians* (Harmondsworth: Penguin Books, 1977), M. Sweet, *Inventing the Victorians* (London: Faber and Faber, 2001), M. Taylor, *The Victorians since 1901*, ed. by M. Wolff (Manchester: Manchester University Press, 2004), John Thomson, *Victorian London Street Life in Historic Photographs* (London: Sampson Low, Marston, Searle & Rivington, 1877), A. Wilson, *The Victorians* (London: Arrow Books, 2003), David Amigoni, *Colonies, Cults and Evolution* (Cambridge: Cambridge University Press, 2007), Peter Mandler, ''Race' and 'Nation' in Mid-Victorian Thought', in *History, Religion and Culture: British Intellectual History, 1750-1950* ed. by Stefan Collini, Richard Whatmore, and Brian Young (Cambridge: Cambridge University Press, 2000) and Thad Logan, *The Victorian Parlour: A Cultural Study* (Cambridge: Cambridge University Press, 2001).

61 Beer, *Darwin's Plots*, 3rd edn (2009), Jonathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2009) and Gowan Dawson, *Darwin, Literature and Victorian Respectability* (Cambridge: Cambridge University Press, 2007).

62 Ellen Dissanayake, *Homo Aestheticus: Where Art Comes from and Why* (New York: Maxwell Macmillan International, 1992), Denis Dutton, *The Art Instinct: Beauty, Pleasure, & Human Evolution* (Oxford: Oxford University Press, 2009) and Michael Ruse, *Taking Darwin Seriously: A Naturalistic Approach to Philosophy* (New York: Prometheus Books, 1998).

Design in the Age of Darwin, Barbara Larson's *The Art of Evolution* and Diana Donald's *Endless Forms.*[63] The current resurgence of interest in the role of beauty in art is discussed by Dave Beech in his anthology *Beauty* and the response of artists to the changing notions of beauty by Elizabeth Prettejohn in *Beauty and Art*.[64] By looking closely at Darwin's work I have contributed to a better understanding not just of nineteenth-century aesthetics but to current debates concerning beauty and aesthetic theory.

None of these works covers my specific area of research, which is a study of the relationship between Darwin's theory of sexual selection and specific artworks of the period in order to show the interplay of ideas between the two and their influence on society. Many of the works on nineteenth-century art listed earlier mention evolution and Darwin but few analyse the scientific implications of his theory of sexual selection and its impact on cultural change and art.

It is significant that Darwin's interest in beauty should take place at the same time as the Aesthetic Movement was emphasising the centrality of beauty to art. Beauty was not just an aesthetic choice, or a popular approach to certain forms and objects, such as blue vases, but a controversial scientific endeavour and this suggests it had an important cultural significance. Beauty became a cultural lightning rod that channelled a diverse range of arguments and issues. Such topics become popular precisely because they do not tackle the main issues but provide an apparently innocuous forum for debate. The real debate, the 'invisible elephant in the room', was, no doubt, apparent at the time but can be difficult to unmask outside the period.[65] The debate about beauty was a surrogate for a debate about origins, who we are, and progress, where we are going, which involved questions regarding the existence of God, morality, identity, class and race and this made beauty a significant agent for social change.

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[63] Dutton, *The Art Instinct: Beauty, Pleasure, & Human Evolution* (2009), S. Eisenman, *Design in the Age of Darwin from William Morris to Frank Lloyd Wright*, ed. by C. Granof (Evanston, IL: Northwestern University Press, 2008), Barbara Larson and Fae Brauer, *The Art of Evolution: Darwin, Darwinism and Visual Culture* (London: University Press of New England, 2009) and Donald and Munro, *Endless Forms: Charles Darwin, Natural Science and the Visual Arts* (2009).

[64] Dave Beech and Gallery Whitechapel Art, *Beauty*, Documents of Contemporary Art Series (London: Cambridge, 2009) and Elizabeth Prettejohn, *Beauty and Art: 1750-2000* (Oxford: Oxford University Press, 2005).

[65] Thomas Collyns Simon, *On the Nature and Elements of the External World: Or Universal Immaterialism Fully Explained and Newly Demonstrated* (London: John Churchill, 1862), p. 18. Simon was criticizing Bishop Berkeley's view that it may be wiser to allow for the possibility of things we cannot perceive.

Chapter 2: Darwin's Theory of Beauty

This chapter describes what I call Darwin's 'theory of beauty' and I show how it explains the beauty associated with sexual selection but acknowledges that there are other types of beauty based on formal properties and learned cultural preferences. I take his theory of sexual selection as the central component of his theory of beauty and supplement this with his notes on beauty from his notebooks and elsewhere and I consider how he described the beauty of the world on his HMS *Beagle* voyage and in later writing. I focus on human beauty, as this is frequently represented in nineteenth-century art, and in this chapter, I consider Darwin's view of a number of secondary sexual characteristics that will be referenced in the artworks discussed later.

Our animal origins have been debated from classical times but in 1844 *Vestiges* brought about the popularization of the idea that the universe is continually changing, with a tendency for the general (the 'homogeneous') to become special (the 'heterogeneous') through a long process of gradual change.[1] This created a popular debate concerning our animal origins that prepared the ground for Darwin's *Origin*. Darwin mentioned beauty briefly in *Origin* because it highlighted a weakness of his theory of evolution by natural selection. In order to explain beauty he developed his theory of sexual selection, which describes beauty as an appearance that has evolved to attract a mate. He recognized that human beings also find certain plants and animals and natural objects beautiful, a fact which he explained in two ways. First, we find other animals beautiful because of our common ancestry and secondly we find symmetry and patterns beautiful. His explanation was debated during the 1860s and his full theory of sexual selection, and therefore beauty, was described in detail in *Descent* in 1871.[2] Darwin's ideas were popularized and widely debated in the mainstream press and were influential across society.

Beauty became a battleground for leading artists and scientists in the decades following the publication of *Origin,* and Darwin's theory of sexual selection generated a debate that was not resolved for a hundred years. For scientists the conflict was between those who saw beauty as evidence of divine creation and those who accepted evolutionary development but who then required an explanation for beauty. Even amongst Darwinians beauty was a contentious issue as many, such as Alfred Wallace, sought to explain all evolutionary change through natural rather than sexual selection.

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1 Chambers suggested that God created all the species through the operation of natural laws rather than through individual acts of creation, Chambers, *Vestiges*, 1st edn (1844), pp. 152-64.

2 In *Origin,* sexual selection is mentioned twenty-three times, mostly in connection with 'weapons' (see page 54) and the beauty of bird song and plumage. It is mentioned once with respect to humans and then as an explanation of the differences between the races (p. 199). Despite these scant references, the debate about beauty started in the 1860s as a response to *Origin*.

Natural selection requires no special forces but sexual selection involves discrimination, selection and choice, and in most species, it is female choice. Sexual selection therefore appeared less scientific as it seemed to be capricious, wilful and unpredictable. Beauty appeared to be outside the province of science and it was regarded as either evidence for divine creation or a mysterious, metaphysical ideal that only human beings could appreciate. Beauty had also, from classical antiquity been linked to moral goodness, which, for many people, limited it to human beings. Some artists personified beauty and regarded its origin as a mystery. Whistler, for example, wrote: '[Beauty] is, withal, selfishly occupied with her own perfection only – having no desire to teach – seeking and finding the beautiful in all conditions, and in all times'.[3]

Darwin's materialistic approach to nature and beauty was a revolutionary idea for scientists, artists and the general population. Many thought that even if humans were descended from ape-like creatures, we acquired something along the way that absolutely distinguished us from other animals. Different authors selected different characteristics, such as a soul, morality, reason, language, consciousness or religion, and many included beauty. Darwin argued that humans and other animals have a similar experience of beauty. For example, he wrote: 'No doubt the perceptive powers of man and the lower animals are so constituted that brilliant colours and certain forms, as well as harmonious and rhythmical sounds, give pleasure and are called beautiful'.[4] He also used the word beauty to describe the sensation an animal experienced from observing the sexual characteristics of the opposite sex.

Darwin's ideas about beauty and sexual selection remained controversial in his lifetime and were then forgotten or dismissed after his death until 1915 when R. A. Fisher (1890-1962) developed a mathematical model that demonstrated how sexual selection could operate, but it was not until the 1970s that it became the subject of an ever-increasing amount of research.[5] Today, there are alternative approaches to sexual selection some of which avoid discussions about beauty by describing sexual

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3 Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus), para. 8.

4 Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, 1st edn, 2 vols (London: John Murray, 1871), II, p. 353.

5 See Cronin, *The Ant and the Peacock* (1991), pp. 118-21, 201. An important milestone was the publication in 1958 of a revised edition of Ronald Aylmer Fisher, *The Genetical Theory of Natural Selection* (Oxford: Clarendon Press, 1930). Another important step in the vindication of Darwin's theory of sexual selection was Lande's 1981 paper that showed mathematically that male traits and female preferences could lead to runaway evolution based on a chance variation at the start, Russell Lande, 'Models of Speciation by Sexual Selection on Polygenic Traits', *Proceedings of the National Academy of Sciences,* 78:6 (June 1, 1981), 3721-25.

characteristics as indicators of fitness.[6] The recent scientific research is not directly relevant to the nineteenth-century dialogue concerning beauty but it is briefly described in Appendix 3 as it largely validates Darwin's ideas, particularly those regarding the key importance of sexual selection and symmetry.

One of Darwin's last statements, read to the Zoological Society the day before he died, following years of controversy regarding sexual selection, was:

> I may perhaps be here permitted to say that, after having carefully weighed to the best of my ability the various arguments which have been advanced against the principle of sexual selection, I remain firmly convinced of its truth.[7]

What is Beauty?

The two opposing views of beauty that generated the most conflict can be summarised by these quotations:

> I wholly deny that the impressions of beauty are in any way sensual;—they are neither sensual nor intellectual, but moral.[8]
>
> Sexual selection implies that the more attractive individuals are preferred by the opposite sex; […] and that these have thus acquired their beauty.[9]

The implications of each view illuminate some of the reasons for the conflict. Ruskin regarded the world as created by God and every plant and animal in the world put there

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6 One such theory is the 'handicap principle', Amotz Zahavi, 'Mate Selection-a Selection for a Handicap', *Journal of Theoretical Biology,* 53 (1975), 205-14. Zahavi argues that those sexual characteristics that are 'honest' or reliable indicators of fitness and health will be favoured. Such characteristics will be so excessive that only the fittest and healthiest animals could maintain them. For example, a weak or ill peacock with a very large tail would soon die. This means that a large tail can only evolve in conjunction with fitness and health and the large tail is therefore a reliable indicator. This theory implies that genes that confer fitness are linked to genes that advertise the fact to a potential mate. In other words, an expensive marketing campaign proves a product is better as no company would last long spending a lot on poor products. This theory avoids the need to posit beauty but it struggles to explain low-cost sexual characteristics or the fact that we find many of them beautiful.

7 Charles Darwin, 'On the Modification of a Race of Syrian Street-Dogs by Means of Sexual Selection. With a Preliminary Notice by Charles Darwin', *Proceedings of the Zoological Society of London,* 25 (18 April, 1882), 367-69 (p. 367).

8 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), IV, p. 42, 'Modern Painters 2'. Ruskin defined beauty in *ibid*., III, p. 109, 'Modern Painters 1' as 'Any material object which can give us pleasure in the simple contemplation of its qualities without any direct and definite exertion of the intellect, I call in some way, or in some degree, beautiful. Why we receive pleasure from some forms and colours, and not from others, is no more to be asked or answered than why we like sugar and dislike wormwood.' Darwin used similar words in the sixth edition of *Origin*, 'How it comes that certain colours, sounds, and forms should give pleasure to man and the lower animals,—that is, how the sense of beauty in its simplest form was first acquired,—we do not know any more than how certain odours and flavours were first rendered agreeable.' Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, 6th edn (London: John Murray, 1872), p. 414. Grant Allen claimed to be able to explain why we receive such pleasures, see Appendix 3, page 376.

9 Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, 1st edn, 2 vols (London: John Murray, 1871), I, p. 421.

for a specific moral lesson or practical use by humans.[10] Every object reflected the love of God and the accurate representation of the world in art was a form of meditation on God's work and a moral lesson.

Darwin used the word 'beauty' in a particular way that differed from how artists used it. In an article in the *Pall Mall Gazette* John Morley criticized Darwin's use of the word as 'loose scientifically, and philosophically most misleading' because Darwin had attributed 'aesthetic consciousness' to birds.[11] Darwin wrote to John Morley (1838-1923) on 24 March 1871 disingenuously agreeing with him and asking Morley to recommend one or two books on aesthetics. Darwin then went on to define what he meant by the 'lowest stage' of beauty:

> When an intense colour, or two tints in harmony, or a recurrent and symmetrical figure please the eye, or a single sweet note pleases the ear, I call this a sense of beauty; and with this meaning I have spoken […] of a taste for the beautiful being the same in mankind (for all savages admire bits of bright cloth, beads, plumes, etc.) […] the sense of beauty in the case of scenery, pictures, etc., is something infinitely complex, depending on varied associations and culture of the mind.[12]

It is likely that Morley would still have disagreed as he wrote that he did not want to attribute 'conscious aesthetic qualities' to other animals. Darwin was providing a materialistic explanation for the existence of beauty and removing the distinction between humans and other animals. It is important to note that Darwin was not discussing the type of beauty we learn to appreciate, cultural beauty, but only what could be called the beauty instinct. The beauty instinct is a combination of what I call sexual beauty and simple beauty. His opponents used beauty to discredit his theory of natural selection and to maintain a fundamental distinction between humans and other animals.

In the second edition of *Descent* (1874), Darwin responded to critics who cited our sense of beauty as something that distinguishes humans from other animals. Darwin began by defining beauty as follows:

> [...] the pleasure given by certain colours, forms, and sounds, and which may fairly be called a sense of the beautiful; with cultivated men such sensations are, however, intimately associated with complex ideas and trains of thought.[13]

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10 'There is not any organic creature, but in its history and habits, it shall exemplify or illustrate to us some moral excellence or deficiency, or some point of God's providential government, which it is necessary for us to know.' See Ruskin, *The Works of John Ruskin* (1903-12), IV, p. 156, 'Modern Painters 2'.

11 John Morley, '"The Descent of Man"', *Pall Mall Gazette,* 1904 (21 March, 1871), 11-12.

12 *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters*, ed. by Francis Darwin and A.C. Seward, 2 vols (London: John Murray, 1903), p. 325, also see Appendix 1, page 318 for the complete text of the letter.

13 Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, 2nd, 15th thousand edn (London: John Murray, 1882), pp. 92-93. See Appendix 1, page 294 for the complete text of the section 'Sense of Beauty'.

He was explaining that he was not ascribing 'complex ideas and trains of thought' to other animals. He went on to say that male birds with 'graceful plumes or splendid colours' display them in front of the female but birds that are not decorated do not, so 'it is impossible to doubt that she admires the beauty of her male partner'. He then pointed out that for the great majority of animals the 'taste for the beautiful' is confined to the attractions of the opposite sex. He added that the reason why certain bright colours should excite pleasure cannot 'be explained, any more than why certain flavours and scents are agreeable; but habit has something to do with the result, for that which is at first unpleasant to our senses, ultimately becomes pleasant, and habits are inherited.' One would expect Darwin to argue that 'certain flavours and scents are agreeable' because those plants are nutritious and so the feeling of pleasure has evolved because animals that find nutritious plants pleasant are more likely to survive. Instead, he seems to be thinking of flavours and scents that are disagreeable at first but which we learn to appreciate through habit.[14]

Regarding simple beauty, Darwin wrote: 'The same principle seems to come into play with vision, as the eye prefers symmetry or figures with some regular recurrence.'[15] In Notebook M, he wrote:

> the repetition of similar forms as in angular leaves, — (this Rhythmical beauty is shown by Humboldt from occurrence in Mexican & Grecian to be single cause).[16]

Darwin supported his view by referring to Hermann von Helmholtz's (1821-1894) claim that certain harmonies and cadences are agreeable for physiological reasons and John Addington Symonds and Hay made a similar claim for the beauty of form.[17] Allen wrote a book describing the physical basis of pleasure and he showed how this gave rise to a sense of beauty.[18]

Pater believed that it was a mistake to try to define beauty, as he thought it was relative and so abstract definitions were useless. Instead, he believed that the critic needed a 'certain kind of temperament, the power of being deeply moved by the presence of beautiful objects.'[19] He identified 'he who experiences these impressions

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14 The Lamarckian implications of this quotation are discussed later in the chapter.

15 Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, 2nd, tenth thousand edn (London: John Murray, 1874), p. 93.

16 Darwin, *Notebook M*, p. 38.

17 Hermann von Helmholtz, *On the Sensations of Tone as a Physiological Basis for the Theory of Music*, trans. by Alexander John Ellis, 4th edn (London: Longmans, 1912), pp. 235-37. 'For the following attempt to explain the pleasure derived from Beauty of Form upon physiological principles I alone am responsible, though I am happy to say Mr. Hay concurs in it.' Symonds, *Principles of Beauty* (1857), p. 30.

18 Grant Allen, *Physiological Aesthetics* (London: Henry S. King, 1877), pp. 1-2.

19 Walter Pater, *The Renaissance: Studies in Art and Poetry*, ed. by Adam Phillips (Oxford: Oxford University Press, 1986, first published 1873), p. xxx.

strongly' as the only type of person with the ability to recognize what is beautiful.[20] Whistler went even further and identified the artist as the only type of person capable of recognizing beauty.[21] For Whistler, the artist was someone born with the ability to 'to pick, and choose, and group with science, these elements, that the result may be beautiful'.[22] For Darwin, and for modern evolutionary psychologists, taste, that is the recognition of beauty, goes hand-in-hand with beauty because one without the other would stop sexual selection. However, Darwin would agree that beauty associated with 'complex ideas and trains of thought' might be the province of a very narrow group.[23]

The OED defines beauty as a quality or combination of qualities that 'affords keen pleasure' and it is applied colloquially to an exceptionally good example of something.[24] This definition of common usage forms a bridge between the classical analysis of beauty and Darwin's explanation of why such qualities and such pleasures evolved. The classical analysis linked beauty and goodness through Plato's doctrine of Ideas. Plato regarded beauty in the world as a dim shadow of the universal and eternal form of beauty that it represented and an artist either creates a 'pointless duplication of the world of appearances' or an 'unreliable and deceptive illusion'.[25] Plato appreciated the 'law bound' art of the Egyptians, which reduced the world to 'universally and eternally valid forms' rather than the 'undisciplined' art of the Greeks. Panofsky points out that from classical antiquity onwards there were two opposed notions: either that art is inferior to nature as it merely imitates it, or that art is superior as it can improve on its deficiencies.[26] Aristotle replaced the dualism of the world of Ideas and the world of appearances with the interaction between general concepts and particular notions, which in aesthetics was between form and matter. The mind of the artist contains a particular form before it is imparted into matter and matter can represent an underlying form or archetype. In the sixteenth century Philipp Melanchthon (1497–1560), an early Protestant theologian, relocated Platonic Ideas as 'conceptions residing in the mind of man' which 'reveal themselves in artistic activity'.[27] This fundamentally changed the way the artist was regarded, as the mind of a great artist could reveal beauty that was otherwise hidden and the Platonic concept of 'idea' became a weapon used against Plato's view of art.

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20 *ibid*.
21 'Nature […] sings her exquisite song to the Artist alone'. Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus), para. 47.
22 *ibid*., para. 41.
23 Darwin, *Notebook M*, pp. 40-41.
24 'Beauty', in *Oxford English Dictionary Online* <http://dictionary.oed.com> [accessed 22 August 2012].
25 Panofsky, *Idea* (1968), p. 4.
26 *ibid*., p. 14.
27 *ibid*., p. 6.

Darwin's *Journal* describing his voyage round the world on HMS *Beagle* followed a long tradition of travel writing and it introduced many of his feelings and thoughts about beauty. He completed his account by September 1837 and it was first published as the third of four books describing the first and second voyages of the *Beagle*. He was inspired by the earlier and popular travel writings of von Humboldt who later described Darwin's own *Journal* as an 'excellent and admirable book'.[28] The book was first published in mid-1839 and Darwin's volume sold out and had to be reprinted in August.[29] In 1845, the second edition with revisions was republished by John Murray; it was revised again in 1860 and it has continued to be republished ever since. As Janet Browne remarks, 'Darwin's *Journal* in fact made him famous' and 'the reviews were in the main favourable' with William Broderip in the *Quarterly* describing him as a 'first-rate landscape-painter with a pen'.[30] We need to ask what sort of landscape painter Darwin was. He frequently described the natural world in his early writing using the words 'beauty' and 'sublime'. For example, in his *Journal* (1860) there are twenty occurrences of the word 'beauty', seven of the word 'sublime' and thirty-two of the word 'taste'. However, we cannot appreciate the aesthetic Darwin by counting words but only by examining the text. As a young man, Darwin was able to combine an artist's feeling for the sublime and beautiful with a fine eye for detail. For example, he wrote;

> The scenery of St. Domingo possesses a beauty totally unexpected, from the prevalent gloomy character of the rest of the island. […] Judging from the appearance, and from similar cases in England, I supposed that the air was saturated with moisture. The fact, however, turned out quite the contrary. The hygrometer gave a difference of 29.6 degs, between the temperature of the air, and the point at which dew was precipitated.[31]

This combination of aesthetic pleasure and scientific detail runs throughout his *Journal* and the attention to detail and observational accuracy reminds us of the Pre-Raphaelites. In the next chapter, we shall see that the *Journal* also included passages that link his aesthetic sensibilities with Whistler and Millais's *Autumn Leaves* and similar works through Darwin's thoughts on the relationship between memory and beauty. Darwin's aesthetic sense is less obvious in his later publications but they still contain an appreciation of beauty in their detailed description of the form and colour of everything from barnacles to orchids. In his autobiography, Darwin claimed that he had lost his aesthetic sense when he was about thirty, even admitted to finding Shakespeare 'so

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28 Alexander Humboldt, *Personal Narrative of Travels to the Equinoctial Regions of the New Continent During the Years 1799-1804*, trans. by Helen Maria Williams (London: Longman, Rees, Orme, Brown, and Green, 1829) and Letter from Alexander von Humboldt to Charles Darwin, 'Your Excellent and Admirable Book', 18 September 1839, Potsdam. The letter was in French and the expression was 'Votre excellent et admirable ouvrage […]'.

29 Browne, *Charles Darwin: Voyaging* (2003), p. 414.

30 *ibid*., p. 417.

31 Charles Darwin, *Journal of Researches into the Natural History and Geology of the Countries Visited During the Voyage of H.M.S. Beagle Round the World, under the Command of Capt. Fitz Roy R.N.*, 2nd edn (London: John Murray, 1845), p. 4.

intolerably dull that it nauseated me'.[32] Gillian Beer argues that Darwin did not lose his aesthetic sense but subordinated it to his science after pressure of work and his illness prevented him from attending galleries and concerts and reading the wide range of literature that he had read when young.[33]

In his library, Darwin had a number of books on art and in his notebooks and correspondence he mentioned other books related to art and aesthetic theory (see page 41). We know from his autobiography that he discussed art at university with Charles Thomas Whitley (1808-1895), and the curator of the Fitzwilliam Museum and derived 'much pleasure' from the pictures in the National Gallery.[34] The overall impression is of someone well educated in fine art and the theories of beauty.[35] Darwin's early reading provided a formal background to his later writing when he discussed the role of beauty in sexual selection. In his later writing, Darwin is not concerned with fine art but with beauty for its own sake as an indicator of sexual selection in operation, which for him took a number of forms; it was not an abstract, metaphysical ideal but was associated with measurable features and animal behaviour.

In his later writing, Darwin stressed the relative nature of beauty, for example, in a key passage he wrote:

> I may first remark that the idea of the beauty of any particular object obviously depends on the mind of man, irrespective of any real quality in the admired object; and that the idea is not an innate and unalterable element in the mind. We see this in men of different races admiring an entirely different standard of beauty in their women; neither the Negro nor the Chinese admires the Caucasian beau-ideal.[36]

Darwin thought our appreciation of the beauty of other species was partly due to our common ancestors and this explained why we find, for example, the peacock's tail

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32 *The Life and Letters of Charles Darwin, Including an Autobiographical Chapter*, ed. by Francis Darwin, 3 vols (London: John Murray, 1887), I, p. 101 but also note his childlike love of flowers *ibid*., p. 117.

33 Gillian Beer, *Darwin's Universal Impact* (2009), online video, University of Cambridge, 2009 <http://www.sms.cam.ac.uk/media/663392> [accessed 22 August 2012].

34 *The Life and Letters of Charles Darwin*, ed. by Darwin, I, p. 49. Whitley became a close friend of Darwin at Cambridge and they corresponded throughout his life. He was Darwin's artistic guide at university and encouraged him to read Reynolds on style and to buy engravings after Raphael including a portrait of Leonardo and one by Johann Mueller, which was probably *Sistine Madonna*, see Browne, *Charles Darwin: Voyaging* (2003), p. 105. Darwin wrote that 'many of the pictures in the National Gallery in London gave me much pleasure; that of Sebastian del Piombo exciting in me a sense of sublimity', Charles Darwin, *The Autobiography of Charles Darwin*, ed. by Nora Barlow (London: Collins, 1887), p. 49,

35 For example, in Darwin, *Descent*, 1st edn (1871), II, p. 354 he added the footnote, 'Mr. Bain has collected ('Mental and Moral Science,' 1868, p. 304-314) about a dozen more or less different theories of the idea of beauty; but none are quite the same with that here given.' Bain summarises the theories of Plato, Aristotle, Shaftesbury, Hutcheson, Père Buffier, Joshua Reynolds, Hogarth, Burke, Alison, Jeffrey, Dugald Stewart and Ruskin, which suggests Darwin was familiar with them all.

36 Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, 4th edn (London: John Murray, 1866), pp. 238-39.

beautiful.[37] Darwin also recognised that other species had attributes that were a combination of inheritance and learning.[38] He also believed that we have a general appreciation of the beauty resulting from colour, repetition, symmetry and proportion, for example, the beauty we find in diatoms.[39] Darwin wrote to G. H. K. Thwaites, a leading expert on diatoms, in 1860:

> […] but do you really suppose that for instance Diatomaceæ were created beautiful that man after millions of generations shd. admire them through the microscope? I should attribute most of such structures to quite unknown laws of growth; and mere repetition of parts is to our eyes one main element of beauty.[40]

When Darwin wrote 'do you really suppose' he clearly regarded teleological arguments as not worthy of serious consideration and he therefore dismissed any arguments that explained the beauty of a diatom as resulting from God's design.[41]

Although Darwin believed that each race differs widely in its standard of beauty, he did assign a universal standard related to a form of progress in art.[42] He assumed that every nation that had advanced enough to have made 'effigies of their gods or of their deified rulers' would endeavour to 'express their highest ideal of beauty and grandeur' in such statues. He then compared the 'Jupiter or Apollo of the Greeks' with Egyptian or Assyrian statues and these with 'hideous bas-reliefs on the ruined buildings of Central America.' The implication was that Western art is a pinnacle of artistic achievement and this assigns an implicit ordering to art that runs from the 'savage', to the Egyptian through to Greece as the cradle of Western civilization and art.[43]

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37 A peacock's large feathers are part of its train not its tail but I will continue to use Darwin's term.

38 Darwin pointed out a bird's song can be both instinctive in terms of the capacity and inclination to sing but also based on the bird's cultural heritage in that some birds learn local dialects and song repertoires. Birdsong dialects have been studied since the 1970s, for example, see Erik Bitterbaum and Luis F. Baptista, 'Geographical Variation in Songs of California House Finches (*Carpodacus Mexicanus*) ', *The Auk,* 96:3 (July, 1979), 462-74.

39 There is a wide range of butterfly colours and forms discussed in Darwin, *Descent*, 2nd, 15th thousand edn (1882), pp. 307-23. The common ancestry point is made in Darwin, *Origin of Species, Fourth Edn.*, 4th edn (1866), p. 240 and the point about bright colours in Darwin, *Descent*, 1st edn (1871), I, p. 64, §16.

40 Thwaites was an expert on the Diatomaceae or what we now call diatoms, one of the most common forms of phytoplankton. See page 303 for the full quotation and reference.

41 Kant also selects marine animals (sea shells) as an example of pure judgement of taste or 'free beauties', Kant, *Critique of Judgement* (2007), p. 60, §41.

42 Darwin, *Descent*, 1st edn (1871), II, pp. 348-50.

43 The possibility that Egyptian art remained largely unchanged for thousands of years because it carried out a particular political function was not mentioned by Darwin. We now have more evidence and the sudden change in Akhenaten's reign to a more mimetic style indicates that the artists were able to change their style based on political requirements.

Darwin's Theory of Sexual Selection

Sexual selection was briefly mentioned in *Origin* followed by an extensive discussion in *Descent* and to a lesser extent in *Expression*. One type of sexual selection was concerned with the selection over many generations of particular characteristics mostly by the female.[44] This gives rise to one type of beauty, which is associated with those characteristics, known as ornaments. The other type of sexual selection is concerned with fighting between members of the same sex to obtain control of copulation and such behaviour is often enhanced by sexual characteristics known as weapons, such as a stag's antlers.[45] Darwin considered sexual selection in a series of animals, starting with molluscs, continuing through insects, amphibians, reptiles, birds and mammals, and ending with humans. Darwin used the word 'beauty' to describe the appearance of these, typically male, ornaments and recognized that the female discriminates.[46] Sexual selection and natural selection are the two mechanisms that determine which individuals will produce, on average, the most offspring that survive and have further offspring. Darwin introduced the idea of sexual selection to explain features that reduced the likelihood of an individual surviving, such as the enormous tail feathers of the peacock and the largely hairless bodies of humans.[47] These features evolve because individuals that possess them are preferentially selected as mates by members of the opposite sex.

Any physical characteristic that is common across all human beings, such as our largely hairless body, indicates that the change took place before humans left Africa.[48] A

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44 Apart from humans, one of the few species where males select based on the beauty of females is the pipefish (*Nerophis ophidion*), whose males care for the young. One theory that explains this behaviour is that the sex that commits the most resources following copulation is the one that does the selecting.

45 Competing involves threat and display as well as actual fighting and so the distinction between the two forms of sexual characteristic is not always clear-cut; a weapon could also be an ornament.

46 Darwin intentionally uses anthropomorphic language and this is often ignored or dismissed by later commentators. However, it is clear that he did mean what he said; he believed that, for example, the peahen discriminates between peacocks and selects based on their beauty. This does not mean that he thought the peahen engaged in ratiocination but neither did he believe that the decision was equivalent to the way water 'chooses' to run downhill. For a fuller discussion see Chapter 1, 'Darwin's Anthropomorphism', in Eileen Crist, *Images of Animals: Anthropomorphism and Animal Minds (Animals, Culture, & Society)* (Philadelphia: Temple University Press, 1999), pp. 11-50.

47 It has been suggested that our hairless bodies are the result of natural selection and one of many adaptations concerned with an aquatic environment, see Elaine Morgan, *The Aquatic Ape Hypothesis: Most Credible Theory of Evolution* (New York: Stein & Day, 1982). Another more recent and widely accepted theory is that we lost our hair to enable us to lose heat more quickly through sweating so that we could hunt in the midday sun by running down animals while other predators were resting in the shade ('persistence hunting'). Other modern theories include the easy removal of parasites, the visual confirmation of a lack of parasites by potential mates, easier to clean to minimise disease, increased visibility of the sexual organs and increased sensitivity during sexual activity.

48 We know from measuring genetic diversity that a relatively small group left and the greatest genetic diversity still occurs in Africa. Darwin was the first to suggest that humans evolved in Africa and then spread from that continent, Darwin, *Descent*, 1st edn (1871), I, p. 199.

particular set of physical characteristics across a single race indicates that selection took place relatively recently in human evolutionary terms and an individual reaction that differs between people in the same race indicates a learned reaction based on the individual's personal history. For Darwin, beauty therefore combines a mixture of universal, racial and cultural aspects, sidestepping the debate about whether it is universal or culturally dependent as it combines both.[49] Darwin's theory does not imply that we are born with a universally shared standard of beauty but it does imply that we are born with a beauty instinct and we share an appreciation of the beauty of sexually selected characteristics.

The idea of 'lower' animals selecting a mate based on beauty seemed trifling and lacking scientific credibility.[50] Unlike traits that arose because of natural selection, those that evolved through sexual selection are flamboyant, decorative, pointless and even damaging to the individual. Natural selection eliminates the weakest until only the fittest survive but sexual selection works down from the most beautiful 'until none but the hopelessly unattractive remain unmated'.[51] The other difference is that natural selection involves no conscious thought; it is the name given to the relative success of different variations. Sexual selection involves, according to Darwin and others, taste, discrimination, aesthetic appreciation and conscious choice.[52]

Sexual selection was one of the most contentious of Darwin's ideas and even he found difficulties. In a letter to Asa Gray on 3 April 1860, he wrote: 'The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick!'[53] This sentence is often quoted as evidence of the doubts Darwin had about sexual selection but in the context of the full quotation, it is likely he was making a humorous comment about a technical problem he had by then solved.[54] The previous November he had published *Origin* in which he claimed the beauty of birds was a result of continued, consistent selection of the most beautiful partners over thousands of generations.[55] He was acutely aware of the difficulties of explaining his theory. He wrote: 'It may appear childish to attribute any effect

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49 This is discussed further in Chapter 5 as the term 'universal' is used here to mean all humans not a metaphysical universal attribute.

50 For example, Mivart wrote: 'it is hardly credible that a female would often risk life or limb through her admiration of a trifling shade of colour, or an infinitesimally greater though irresistibly fascinating degree of wartiness', Mivart, *On the Genesis of Species* (1871), p. 61.

51 Conwy Lloyd Morgan, *Habit and Instinct* (London: E. Arnold, 1896), p. 219. In some species, a few males engage in most of the matings, for example, 'a single sage grouse cock may perform half of all the matings at one lek', Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (1994), p. 137.

52 'The process is determined by conscious choice.' See Morgan, *Habit and Instinct* (1896), p. 219.

53 Letter from Charles Darwin to Asa Gray, 'The Sight of a Feather in a Peacock's Tail', 3 April 1860, Down. Note that the titles given to some letters are my own and do not necessarily reflect the main subject of the content.

54 See footnote, page 351.

55 Darwin, *Origin*, 1st edn (1859), p. 89 .

to such apparently weak means,' but he had clearly thought about it deeply as he added: 'I have not space here to enter on this subject.' In 1864 he wrote to Alfred Wallace: 'It is an awful stretcher to believe that a Peacock's tail was thus formed' but significantly he added: 'but believing it, I believe in the same principle somewhat modified applied to man.'[56] Natural selection and sexual selection often pull in opposite directions as with the peacock's tail, which requires extra nutrition to produce and makes the owner less able to escape predators. Recent research shows that because of positive feedback sexual selection is much more powerful than natural selection and can bring about significant changes in a few hundred generations.[57]

Darwin's other theory, of natural selection, was already viewed as contentious as it removed the need for divine intervention and classified humanity as just another animal, but it was also associated with positive virtues such as strength, efficiency, utility, fitness and health. Herbert Spencer's (1820-1903) law of the 'survival of the fittest' was interpreted as giving support to imperialism, racism, and a 'no holds barred' capitalism through a misidentification of the fittest with whatever the interpreter considered 'the best'.[58] This error of using the term metaphorically and equating it with progress appeared to endorse, at least to European men, the position of the white European male at the top of a 'ladder of creation'. It was suggested later in the century that those who were seen to be unfit—the poor, the disabled, criminals, and the insane, should be prevented from breeding as it was thought that this would lead to the degeneration of the race. Some also used it to justify the exploitation of the unfit, women and the 'savage' races.[59] Darwin's views about woman and the supremacy of Western European culture would today be regarded as misogynistic and racist but, as mentioned earlier, this must be counter-balanced by his views on women's education, his stand against slavery and his view that the weak and disabled need our sympathy and support.[60] Writers on Darwin

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56 Letter from Charles Darwin to Alfred Russel Wallace, 'Beauty and Sexual Selection', 15 June 1864, Down, Bromley, Kent.

57 Positive feedback is the name of the mechanism that causes any increase in the output of a system to increase the output further unlike negative feedback in which any increase results in a reduction. Systems that incorporate positive feedback are unstable as they give rise to runaway change, which only stops when the system reaches some physical limit.

58 Spencer equates 'survival of the fittest' with what Darwin called 'natural selection', Spencer, *The Principles of Biology* (1864), pp. 444-45. Both terms have misleading associations.

59 The word 'savage' did not have the same associations as it does today; for example, Grant Allen used it but pointed out that many tribes, such as the Fijians, had a better aesthetic taste than 'the vast majority of Englishmen', see Grant Allen, 'Cimabue and Coal-Scuttles', *Cornhill Magazine,* 42:247 (July, 1880), 61-76 (pp. 63-66).

60 Darwin believed that women are intellectually less able than men but favoured women's education. See Letter from Charles Darwin to E. M. Dicey, 'The Education of Girls in Physiology', [1877]. His stand against slavery is clearly described in Desmond and Moore, *Darwin's Sacred Cause: Race, Slavery and the Quest for Human Origins* (2010). Darwin thought that if the 'imbecile, the maimed, and the sick' were allowed to have children it would lead to degeneration. However, he thought we had evolved a sense of sympathy and this was the noblest part of our nature and so 'we must bear without complaining the undoubtedly bad effects of the weak surviving', Darwin, *Descent*, 1st edn (1871), I, pp. 168-69.

typically distinguish between his scientific theories and his personal views that were determined by his role as a Victorian gentleman and his need to maintain respectability.[61]

When examining Darwin's ideas and theories it is misleading to project back our scientific understanding of, for example, Gregor Mendel's (1822-1884) theory of inheritance and our knowledge of the role of DNA, as well as our twenty-first century cultural assumptions. It is clear that many of the ideas Darwin expressed in his books, particularly later editions, conflict with his own theories. For example, in later editions of *Origin* and in *Descent* he added sections which can now be read as Lamarckian.[62] Earlier, Darwin had consistently rejected any form of Lamarckian inheritance but this softening of his view may have been driven by a need to find mechanisms that would speed up evolution given the short time available according to William Thomson's (1824-1907) estimate of the age of the earth.[63] A related danger is that Darwin's work is presented as a Whig history showing how the 'great' historic figures achieved the inevitable progress towards greater freedom and enlightenment, culminating in today's human rights and liberal democracy.[64] This is a particular problem for a historian of science trying to avoid a sense of inexorable progress although, as we have seen, Thomas Kuhn introduced the notion of a 'paradigm shift' that was based on the idea of science as a social endeavour.[65] The ubiquitous nature of progress means that it is difficult to avoid interpreting historic texts with a modern understanding.

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61 Dawson argues that Darwin went to great lengths to maintain his image as a Victorian gentleman as the respectability associated with this role was essential to maintaining his credibility as a scientist, see Dawson, *Darwin, Literature and Victorian Respectability* (2007), p. 10.

62 Lamarck proposed that an organism's efforts during its lifetime led to features that could be acquired by their offspring, see Lamarck, *On Classification and Evolution, Extracts from Philosophie Zoologique, Ou Exposition Des Considérations Relatives À L'histoire Naturelle Des Animaux* (1914). Lamarck's views were discredited in the first half of the nineteenth century but the inheritance of acquired characteristics creeps increasingly into Darwin's later editions. For example, in *Descent* Darwin mentions faculties that 'have been strengthened by use' and 'Consequently, in accordance with the principle often alluded to, we might expect that they would at least tend to be transmitted chiefly to the male offspring at the corresponding period of manhood', Darwin, *Descent*, 1st edn (1871), II, p. 328.

63 Thomson's 1864 estimate for the age of the earth was 20-400 million years but he gradually reduced the upper limit and by 1897, it was 40 million years at most. His paper, 'Of Geological Dynamics' presented to the Geological Society in 1869 challenged Huxley's and Darwin's assumptions about the age of the earth. William Thomson was made Baron Kelvin in 1892.

64 In the history of science a 'Whig' approach can be effective as long it provides a neutral interpretation but not if it overlays a particular interpretation of a currently contentious issue. 'The study of the past with one eye, so to speak, upon the present is the source of all sins and sophistries in history', Herbert Butterfield, *The Whig Interpretation of History* (London: G. Bell, 1931), p. 11 and pp. 31-32.

65 Kuhn points out that 'for many men the abolition of that teleological kind of evolution' was regarded as the most significant and least palatable of Darwin's ideas, Kuhn, *The Structure of Scientific Revolutions* (1970), pp. 172-73. He goes on to suggest that science evolves in a similar way and that the scientific endeavour has no set goal or permanent fixed truth towards which it is moving. The question of why science should be possible at all, he simply says 'is as old as science itself'.

Darwin's Visual Metaphors

Journal was both popular and scientifically sound and established Darwin as a leading and respectable scientific figure of the day, but it also had an aesthetic message. Throughout the book, his driving narrative combines strong emotions controlled by close observation of the particular. For example, the often-quoted metaphor of the 'entangled bank' was first used in his *Journal* where he refers to the 'entangled forest' and later the 'entangled jungle'.[66] Beer suggests the metaphor may be a 'punning cross-play' as the primary meaning given to 'evolve' in the 1826 edition of Johnson's dictionary is 'To unfold: to disentangle'.[67] However, he used the word 'entangle' and 'entangled' twenty-one times in the *Journal* before he fully developed his ideas concerning evolution, which suggests it is a visual metaphor conveying the overwhelming detail and complexity of nature. Darwin wrote: 'to paint the effect is a hopeless endeavour. Learned naturalists describe these scenes of the tropics by naming a multitude of objects, and mentioning some characteristic feature of each' and he struggled to find the language to express his feelings, as 'epithet after epithet is found too weak'.[68] He described the process of seeing this complexity:

> I stopped again and again to gaze on these beauties, and endeavoured to fix for ever in my mind an impression, which at the time I knew, sooner or later must fail. The form of the orange-tree, the cocoa-nut, the palm, the mango, the tree-fern, the banana, will remain clear and separate; but the thousand beauties which unite these into one perfect scene must fade away; yet they will leave, like a tale heard in childhood, a picture full of indistinct, but most beautiful figures.[69]

Darwin was describing the difficulty of remembering the overall complexity of nature and he identified the 'the thousand beauties which unite' as the basis of the 'perfect scene'. He could remember the form of particular plants clearly but only as separate entities and it was the overall impression that he wished to remember. However, he knew that although the 'thousand beauties' would be forgotten, something would be remembered. Our memory creates an indistinct scene of 'beautiful figures' and he associated this with tales heard in childhood. This suggests that memory creates a form of beauty that is based on a remembrance of things past, a form of nostalgia.[70] In other words, he links beauty with the ability of memory to create indistinct but beautiful forms. He is also suggesting two ways of seeing the world, the conventional scientific observation that is used to record a particular specimen or a precise hygrometer reading and the subjective memory of a scene that is indistinct but retains its beauty.

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66 Darwin, *Origin*, 1st edn (1859), p. 489, Darwin, *Journal of Researches*, 2nd edn (1845), p. 204 and p. 496.
67 Beer, *Darwin's Plots*, 3rd edn (2009), p. 23.
68 Darwin, *Journal and Remarks* (1839), p. 590.
69 *ibid*., p. 591.
70 Nostalgia is a word that was coined in 1688 to describe a form of melancholy; it is a Greek compound of two words meaning 'return home' and 'pain', *OED*.

Rossetti wrote:

> But the motive powers of art reverse the requirement of science, and demand first of all an *inner* standing point. The heart of such a mystery as this must be plucked from the very world in which it beats or bleeds[71]

Darwin's second way of seeing is an inner standing point that engages with nature in an artistic rather than a scientific way.

Darwin's *Journal* and correspondence are full of visual metaphors and he made it clear that his visual 'delirium of delight' enabled him to learn to see the world in a new way.[72] Darwin was overwhelmed by the multitude of forms he found in the Brazilian jungle and the delirium of delight arose because whichever way he turned 'fresh treasures' would meet his eye. He described the beauty of the vegetation as follows:

> The delight one experiences in such times bewilders the mind, — if the eye attempts to follow the flight of a gaudy butter-fly, it is arrested by some strange tree or fruit; if watching an insect one forgets it in the stranger flower it is crawling over, — if turning to admire the splendour of the scenery, the individual character of the foreground fixes the attention. The mind is a chaos of delight […][73]

He wrote to his father: 'It is utterly useless to say anything about the Scenery—it would be as profitable to explain to a blind man colours, as to [a] person who has not been out of Europe, the total dissimilarity of a Tropical view.'[74]

The idea of seeing the world in new ways was part of the motivation of the Pre-Raphaelites, who described Joshua Reynolds as 'Sloshua' and looked back to before Raphael to find an innocent way of looking at the natural world, uncontaminated by technique.[75] Pre-Raphaelite paintings, such as Millais's *Ophelia* (1851-52, Figure 20), demonstrated a commitment to this idea through the sheer hard work obvious in the detail of the brushwork. They were worked over in minute detail on every inch of the canvas, producing a flat tapestry of colour that assigned every object in the foreground, middle ground and background equal prominence. The visual field is enclosed by nature and the eye flits from one precisely represented plant to another, recalling how Darwin would 'gaze on these beauties' as he 'endeavoured to fix for ever in my mind an impression'. We know that *Ophelia* was the result of months of painstaking painting on

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71 Dante Gabriel Rossetti, 'The Stealthy School of Criticism', *The Athenaeum,* 2303 (16 December, 1871), 792-94 (p. 793).

72 Letter from Charles Darwin to Frederick Watkins, 'Delirium of Delight', 18 August 1832, Monte Video, Riv. Plata.

73 Charles Darwin, *Beagle Diary* (Darwin Online) <http://darwin-online.org.uk/content/frameset?viewtype=text&itemID=EHBeagleDiary&pageseq=1> [accessed 22 August 2012], p. 115 (a transcription of Darwin's handwritten diary).

74 *The Life and Letters of Charles Darwin*, ed. by Darwin, I, p. 228.

75 The reference to 'Sloshua' is in William Michael Rossetti, *Dante Gabriel Rossetti. His Family-Letters with a Memoir* (London: Ellis, 1895), p. 157. The 1970 facsimile edition includes a footnote on the same page that sloshy meant a 'hasty, washy, indeterminate manner in painting, neglectful of severe form and accurate detail, and lavish of unctuous vehicle'.

the banks of the Hogsmill River near Esher.[76] As the painting took so long to produce, it conflated time, which for scenes of nature produced anachronisms. The painting consists of an assembly of minutely observed yet disconnected parts. Both Millais and Darwin decomposed nature into a jumbled sequence of minutely observed objects, but both also had a bigger picture to paint. Millais was representing the poignant death of a tragic figure and Darwin extracted his 'general laws' from these carefully observed instances.[77]

In a letter to John Stevens Henslow (1796-1861), Darwin wrote: 'there is a transparency in the air & a confusion of distances & a sort of stillness which gives the sensation of being in another world'.[78] This clarity and intensity of vision are often aspects of Darwin's writing during his *Beagle* voyage, and the feeling his descriptions invoke is similar to that produced by Holman Hunt's *The Scapegoat* (1854-6, Figure 21), particularly when looking at the remote purple-tinged hills. There is a similar confusion of distances between the hills and the goat. The goat is grotesque in its detail, its physical presence and its absurd red ribbon emphasising the visual ambiguities.

Darwin's later work, particularly the eight years he spent studying every type of barnacle, taught him that each living thing is an individual and that the concept of species is a human construct.[79] James Krasner's analysis of Darwin's writing led him to conclude that in Darwin's vision of the world 'Nature has no clear, monolithic forms, no specially created species, but various biological components that are incessantly flowing, reforming, and rearranging.'[80] In Darwin's world forms that were formerly fixed melted one into another, stable categories dissolved and there was nothing holding firm; everything, including knowledge itself became unanchored. This can be seen by the example already mentioned of Darwin's explanation of how a bear could turn into a whale.[81]

Darwin worked closely with artists and illustrators, and later photographers, to ensure that his diagrams precisely illustrated the features and attributes he wished to

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76 Millais is now thought to have sat in the 'Six Acre Meadow on the west bank at the bottom of the Manor House garden in Old Malden', Richard Savill, 'Mystery of Location of Millais' Ophelia Solved', *The Telegraph*, 30 June 2010.

77 'My mind seems to have become a kind of machine for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone, on which the higher tastes depend, I cannot conceive', Darwin, *The Autobiography of Charles Darwin* (1887), p. 139.

78 Letter from Charles Darwin to John Stevens Henslow, 'Mountain View with a Confusion of Distances', 18 April 1835, Valparaiso.

79 Darwin wrote, in a letter to Hugh Strickland: 'it is pure guesswork (being guided by range and commonness and habits) to recognise any species', *The Life and Letters of Charles Darwin*, ed. by Darwin, I, p. 370.

80 James Krasner, 'A Chaos of Delight: Perception and Illusion in Darwin's Scientific Writing', *Representations,* 31 (Summer, 1990), 118-41 (p. 138).

81 Darwin, *Origin*, 1st edn (1859), p. 184, see page103.

convey.[82] He also studied art works closely as he thought artists would provide the examples he needed of human expressions but he was disappointed and turned to illustration and photography. In *Expression* he wrote:

> I had hoped to derive much aid from the great masters in painting and sculpture, who are such close observers. Accordingly, I have looked at photographs and engravings of many well-known works; but, with a few exceptions, have not thus profited. The reason no doubt is, that in works of art, beauty is the chief object; and strongly contracted facial muscles destroy beauty. [83]

Human Beauty

In *Descent* Darwin proceeds through the animal kingdom, taking 488 pages to examine example after example of sexual selection in animals, starting with molluscs and ending with Quadrumana.[84] Then, in Chapter 19 of *Descent*, he describes 'Secondary Sexual Characters of Man' and in the final three chapters, Darwin discusses human beauty. Darwin looked for characteristics that were described locally as beautiful and which varied between males and females. This process enabled him to minimize his subjective and cultural bias, although sometimes with mixed success.

There are many traits in humans that have been suggested as resulting from sexual selection, such as our relatively hairless bodies, the long hair on our head, male beards, pubic hair, rounded female breasts and buttocks, the female hip-to-waist ratio, and the large, boneless human penis.[85] It has also been suggested that language, art, morality, courtship behaviour and our large brain size are the result of sexual selection. Darwin pointed out that many sexually selected characteristics are inherited by both sexes so if males did select hairless females then males would also inherit the hairlessness, although often to a lesser degree. The ability to appreciate such sexually selected characteristics would also be inherited by both sexes.[86]

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82 Darwin's close interaction with artists to achieve his precise requirements is well described in Smith, *Charles Darwin and Victorian Visual Culture* (2009) and Prodger, *Darwin's Camera: Art and Photography in the Theory of Evolution* (2009).

83 Darwin, *Expression, 1st Edn* (1872), pp. 14-15. Darwin was expressing the views of Lessing who maintained that 'expression beyond the legitimate limits of art' should be subordinated to beauty, Gotthold Ephraim Lessing, *Laocoön: The Limits of Poetry and Painting*, trans. by William Ross (London: J. Ridgway & Sons, 1836, first published 1766), p. 22.

84 The first animal described by Darwin as having visual secondary sexual characteristics is the *Crustacea Squilla*, a type of shrimp (p. 335). Quadrumana is an obsolete term meaning four hands and it was originally used to distinguish humans (Bimana) from other great apes (chimpanzees, gorillas, and orang-utans) but from the 1860s the distinction between humans and other great apes broke down.

85 Darwin chose only the most socially acceptable to discuss in *Descent*.

86 Some recent research indicates that there could be differences between the way that men and women appreciate beauty. The brains of men and women show different regions activated when presented with unfamiliar paintings by artists from different schools, Camilo J. Cela-Conde et al., 'Sex-Related Similarities and Differences in the Neural Correlates of Beauty', *Proceedings of the National Academy of Sciences,* 106:10 (10 March, 2009).

Darwin started by comparing men and women, first the physical differences such as height, strength and musculature, and then he wrote:

> Man is more courageous, pugnacious and energetic than woman, and has a more inventive genius. His brain is absolutely larger, but whether or not proportionately to his larger body, has not, I believe, been fully ascertained. In woman the face is rounder; the jaws and the base of the skull smaller.[87]

It has always been difficult to separate the strictly factual from commonly held beliefs particularly for attributes that are difficult to define, such as ‘courage’ and ‘energy’.

He was aware that his theory relied on evidence that could have been distorted. He wrote: ‘some writers doubt whether there is any such inherent difference [between men and women]’.[88] He countered this attack by pointing out the differences between the males and females of other species. In addition, much of his evidence depended on third-party reports from around the world, particularly regarding behaviour when physical specimens could not be examined, but he always tried to find corroborative evidence. Another possible distortion in his writing was his potential bias regarding female roles.[89] We have seen, for example, that he thought men had a ‘more inventive genius’. Finally, as has been noted, he had to maintain the respectability expected from a Victorian gentleman and a serious scientist.

He went on to describe the physical similarities between children and females. Neoteny, or the retention of childhood characteristics into adulthood, has been suggested by Stephen Jay Gould (1941-2002) as the mechanism for many human features, such as our hairless skin, unrotated big toe, thin bones, and brain size.[90] Darwin pointed out that male and female children are similar, and there are fewer race-differences between children. He also pointed out what he called the law of the equal transmission of characters to both sexes, which means that a characteristic acquired by one sex is transferred to the other. Although the mechanism of heredity was not known to Darwin, we now know that the only chromosome that differs between the sexes is the Y

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87 Darwin, *Descent*, 1st edn (1871), I, p. 557

88 Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 563. He may be referring to John Stuart Mill, *The Subjection of Women* (Charleston, SC: Forgotten Books, 1869) or Frances Power Cobbe, 'Criminals, Idiots, Women, and Minors', *Fraser's Magazine,* 78:468 (December, 1868), 777-94. Cobbe wrote to Darwin on 28 March [1870?] offering him her copy of Kant to encourage him to switch from his utilitarian principles to a moral standard based on his innate sense of right and wrong.

89 Female roles were defined with respect to men. The main three were supportive wife, caring mother and nursing daughter. In the home, the concept of ‘pater familias’ was well established and the wife’s place was secondary to, but supportive of, her husband. For example, ‘Man must be pleased; but him to please│Is woman's pleasure’, Coventry Patmore, *The Angel in the House* (London: John W. Parker, 1854), p. 125.

90 Chapter 10, 'Retardation and Neoteny in Human Evolution', Stephen Jay Gould, *Ontogeny and Phylogeny* (Cambridge, MA: Harvard University Press, 1977), pp. 352-404. Also see Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (1994), pp. 316-17.

chromosome.[91] Darwin went on to describe women as objects to be fought over, particularly with respect to the most beautiful. He wrote: 'women are the constant cause of war' with 'savages' and mentioned the mythical Helen of Troy as an example.[92]

'Savages' were seen by many as representing an earlier stage in the evolution of humans, with those whose habits differ most from Europeans representing the earliest stages, thus being closest to our ape-like ancestors.[93] Darwin pointed out that 'savages pay the greatest attention to their personal appearance' and 'have a passion for ornament'.[94] He also carefully distinguished between the habits of 'savages' and what he called 'primeval man' as our ancestors did not necessarily have the same social structures as present day tribal communities.[95]

The following sections describe in scientific and historical terms various sexual and other characteristics of the human body and face that were discussed by Darwin. They are the visual basis that I use to link Darwin, the artist and the model and the scientific summary presented in this chapter provides the basis for a new way of examining the art works discussed later.

Hairless Skin

Darwin considered our 'hairless' bodies a sexually selected characteristic.[96] He wrote:

> I am inclined to believe, as we shall see under sexual selection, that man, or rather primarily woman, became divested of hair for ornamental purposes; and according to this belief it is not surprising that man should differ so greatly in hairiness from all his lower brethren, for characters gained through sexual selection often differ in closely-related forms to an extraordinary degree.[97]
>
> The absence of hair on the body is to a certain extent a secondary sexual character, for in all parts of the world women are less hairy than men.[98]

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91 In most mammals and some insects the females have two X chromosomes and the male has one X and one Y chromosome. In humans, if a characteristic is only exhibited by one sex then in males its development is controlled by the Y chromosome typically through the production of high levels of the male sex hormone, testosterone, in the womb and again at puberty. Women are the default gender in the sense that there is no specific female chromosome and female sexual characteristics are controlled by the level of oestrogens.

92 Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 561.

93 The word 'savage' did not have the same associations as it does today; for example, Grant Allen used it but pointed out that many tribes, such as the Fijians, had a better aesthetic taste than 'the vast majority of Englishmen', see Allen, 'Cimabue and Coal-Scuttles', *Cornhill Magazine,* 42:247 (July, 1880), 61-76 (pp. 63-66).

94 Darwin, *Descent*, 1st edn (1871), II, p. 338.

95 For example, when arguing against promiscuous intercourse Darwin said that 'savages' do not represent primeval man, *ibid*., pp. 358-63.

96 We have the same density of body hair as other apes but human hair is fine and short and known as vellus hair.

97 Darwin, *Descent*, 1st edn (1871), I, pp. 149-50.

98 *ibid*., II, p. 376.

The skin is therefore an 'ornament' and a primary method for displaying beauty and so a primary source of sexual desire. As we have seen, Darwin considered ornaments racially dependent and so the attractiveness of a naked person would be racially and culturally specific, although the universality of this particular ornament suggests that it is regarded as attractive across all races. He described how different cultures enhanced the skin in different ways with various colours, marks and additional ornaments.

As 'the loss of hair is an inconvenience and probably an injury to man' Darwin regarded it as an example of sexual selection, although in a footnote he pointed out that Wallace's view was 'that some intelligent power has guided or determined the development of man.'[99] Darwin undermined Wallace's argument by quoting Rev. T. R. R. Stebbing's (1835-1926) comment, that had Mr. Wallace 'employed his usual ingenuity on the question of man's hairless skin, he might have seen the possibility of its selection through its superior beauty or the health attaching to superior cleanliness.'[100]

As women of all races are less hairy than men Darwin suggested that 'this new character of nudity' must have taken place 'at an extremely remote period' and been transmitted almost equally to both sexes.[101] Our 'female semi-human progenitors' lost their hair first but as they acquired nudity they transmitted it to their offspring of both sexes. The evolution of nudity, like many sexual characteristics, makes individuals less fitted to the environment, but Darwin explained that this should not be regarded as surprising as in all animals 'innumerable strange characters have thus been esteemed'.[102]

Darwin also considered the small number of very hairy individuals and he referred to photographs he assumed the reader would have seen:

> All who have seen photographs of the Siamese hairy family will admit how ludicrously hideous is the opposite extreme of excessive hairiness. Hence the king of Siam had to bribe a man to marry the first hairy woman in the family, who transmitted this character to her young offspring of both sexes. [103]

The Siamese family Darwin refers to was suffering from the autosomal dominant syndrome, congenital hypertrichosis lanuginosa.[104] The first man known to have suffered

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[99] *ibid*., p. 375. Darwin was quoting Alfred Russel Wallace, *Contributions to the Theory of Natural Selection: A Series of Essays*, 2nd edn (London: Macmillan and Co., 1871), p. 350.

[100] Footnote 19, Darwin, *Descent*, 1st edn (1871), II, p. 376.

[101] Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 601.

[102] Darwin, *Descent*, 1st edn (1871), II, p. 377. See full quotation on page 282.

[103] Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 601.

[104] 'Autosomal' means the mutation is not in a sex chromosome, 'dominant' means only one gene need have the mutation for it to be expressed. Hypertrichosis is an overgrowth of hair not localized to the normal areas of the skin where hair grows. Lanugo is the silvery blonde hair that covers the bodies of normal foetuses. A number of sufferers of this and related syndromes are known and were often displayed in circuses as 'freaks'. Stories about the hairy family from Burma had circulated since the 1820s see Jane Goodall, *Performance and Evolution in the Age of Darwin: Out of the Natural Order* (London: Routledge, 2002), pp. 76-78. One family member known as Krao was exhibited in London in 1883, see Elizabeth Anne Maxwell, *Colonial*

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from this genetic defect was Shwe-Maong, who married a wife 'chosen for him by the King from the beautiful women of his retinue'.[105] Darwin's comment, on the ludicrous and hideous nature of excessive hairiness, points to another aspect of beauty—the attraction of the unusual and grotesque. In 1857 when Julia Pastrana arrived in Britain, she was known as the baboon-woman because of her hairy face and body and after the publication of *Origin*, she was seen as a possible missing link.[106] She was described as 'kindly and womanly in nature' but sadly died in childbirth in 1860 and her body and dead child were mummified and toured round Europe. Browne indicates that the Victorian freak show makes us aware of just how different Victorian society really was but Pastrana's corpse was also toured round the United States in the 1970s.

Various races enhance the naked skin through ornamentation, or colouring and Darwin saw that beauty in some eyes could be considered deformed in others. He wrote:

> As the negro of Africa raises the flesh on his face into parallel ridges 'or cicatrices, high above the natural surface, which unsightly deformities, are considered great personal attractions;' [107]

We find the peacock's tail beautiful, possibly because of our common ancestry, or because, as has been pointed out recently, we may have evolved, like birds, to attach great importance to eye-like shapes, but we find traits that conflict with human sexual characteristics hideous and ludicrous. Therefore, bright colours are attractive, unless the viewer has been educated to find such combinations unsophisticated, but only in certain situations. If they are on a monkey's posterior, we find them grotesque as they conflict with a specific human sexual characteristic.[108]

Photography and Exhibitions: Representations of the Native and the Making of European Identities (London: Continuum International Publishing, 2000), pp. 55-58

[105] J. Bondeson and A. E. W. Miles, 'The Hairy Family of Burma: A Four Generation Pedigree of Congenital Hypertrichosis Lanuginosa', *Journal of the Royal Society of Medicine,* 89 (July, 1996), 403-08 (p. 403), Figure 22.

[106] Janet Browne and S. Messenger, 'Victorian Spectacle: Julia Pastrana, the Bearded and Hairy Female', *Endeavour,* 27:4 (Dec, 2003), 155-59 (p. 155).

[107] Darwin, *Descent*, 1st edn (1871), II, p. 296, Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 541. Darwin was quoting from Samuel Baker's *The Nile Tributaries of Abyssinia* (1867). Baker (1821-1893) was an explorer, big game hunter and abolitionist.

[108] In Darwin, *Descent*, 1st edn (1871), II, p. 296, he wrote: 'No doubt it is to us a most grotesque notion that the posterior end of the body should be coloured for the sake of ornament even more brilliantly than the face; but this is not more strange than that the tails of many birds should be especially decorated.' In a letter to Victor Alexander Ernest Garth Marshall (1841–1928), on 14 September 1879, he accepted Ruskin's accusation that he had 'a deep and tender interest about the brightly coloured hinder half of certain monkeys.' We should take this as a humorous comment on both his scientific interest and Ruskin's jibe.

Racial Variation in Hairiness

Darwin gathered a great deal of evidence for racial variations in hairiness as it supported his ideas of sexual selection. This was part of his interest in hair, both the long hair on our heads and male beards, which are discussed below. Darwin started by pointing out that the Japanese have little hair although surprisingly the Ainos of the northernmost islands of Japan are the 'hairiest men in the world'.[109]

> [...] the Aymaras and Quichuas of the Cordillera are remarkably hairless, yet in old age a few straggling hairs occasionally appear on the chin. The men of these two tribes have very little hair on the various parts of the body where hair grows abundantly in Europeans, and the women have none on the corresponding parts. The hair on the head, however, attains an extraordinary length in both sexes, often reaching almost to the ground.[110]

Darwin may have been commenting in a roundabout way on the lack of underarm and pubic hair combined with very long hair on the head, a combination often found in nineteenth-century paintings of the female nude. Darwin did not discuss variations in pubic hair in different races but its depiction in paintings was considered unacceptable and some of the reasons are discussed by William Miller.[111]

The subject of pubic hair is often associated with Ruskin's alleged disgust on his wedding night.[112] Robert Hewison mentions the letter from Effie to her father six years after her wedding night on 10 April 1848 when she wrote that Ruskin 'had imagined women were quite different to what he saw I was, and […] he was disgusted with my person the first evening'. Ruskin made a statement to his lawyer that 'though her face was beautiful, her person was not formed to excite passion. On the contrary, there were certain circumstances in her person which completely checked it.' One theory was that his disgust was based on his never having seen pubic hair but this is thought unlikely because of the erotic images he could have seen at Oxford and speculation that he visited prostitutes. Hewison also mentions the theory that Effie's menstrual cycle interfered with their wedding night consummation but this is also unlikely as they agreed to delay sex until her twenty-fifth birthday six years later and it does not correspond with his description of her person as 'not formed to excite passion'. The key word is 'formed', a word Ruskin would not use casually. The word seems to rule out menstruation or pubic hair although Miller observes that a hair in the mouth elicits the earliest facial expressions of disgust and it may therefore be the 'universal disgust substance'.[113] In Ruskin's case,

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[109] *ibid*., p. 321.
[110] *ibid*., pp. 322-23.
[111] William Ian Miller, *The Anatomy of Disgust* (Harvard: Harvard University Press, 1997), pp. 54-55.
[112] Robert Hewison, *John Ruskin* (Oxford: Oxford University Press, 2007), p. 37.
[113] Ruskin's alleged disgust with pubic hair and his attraction to pre-pubescent girls and hair's connection with disgust are discussed In Miller, *The Anatomy of Disgust* (1997), p. 55. These and similar considerations may be part of the reason for a lack of body hair in representations of

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we are left with some aspect of Effie's form that elicited a feeling of disgust but which we must assume was hidden from view by her clothing and which made her 'quite different' from other women in Ruskin's eyes.

Darwin also investigated the importance of hair to male beauty in various societies. He reported that African men in some tribes treated the preparation of their hair as important, and in some tribes 'hair and teeth are dyed various tints' and 'in Northern Africa "a man requires a period of from eight to ten years to perfect his coiffure."'[114] He also mentioned that in some South American tribes very long hair is 'so much valued for the sake of beauty, that cutting it off was the severest punishment which he could inflict on them'.[115] The way in which the hair is treated can be used as a tribal marker and amongst the natives of Central Africa: 'every tribe has a distinct and unchanging fashion for "dressing the hair"'.[116] The Indians of Paraguay, for example, remove their eyebrows and eyelashes, as they 'do not wish to be like horses'.[117] This practice appears to be related to courtship in some tribes; the Maoris of New Zealand used to pluck out all the hairs from their face as they thought: 'There is no woman for a hairy man.'[118] This widespread attention to male beauty suggests that the focus on female beauty in nineteenth-century England could be a local, racial anomaly. It is therefore interesting in Chapter 4 to consider examples where the artist has emphasised male beauty.

Darwin considered the origin of our relatively hairless bodies. He noted that the human foetus has woolly hair or *lanugo* so it is likely that humans are descended from a hairy animal, and the hair on the body and round the mouth of a human foetus is longer at five months than the hair on its head, suggesting that long hair on the head is a late evolutionary development.[119] Darwin regarded the ancestral loss of hair as an injury as humans are 'thus exposed to the scorching of the sun, and to sudden chills, especially during wet weather' and he pointed out that natives in all countries are glad to protect their back with some slight covering.[120] Hair as a sexual ornament in the work of artists is examined later in terms of male beards, female naked skin and long hair.

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the nude. Another possibility is that the representation of pubic hair undermines the conventions used by artists to disassociate the naked female body from sexual desire.

114 Darwin, *Descent*, 1st edn (1871), II, p. 340.

115 *ibid*., p. 348.

116 *ibid*., p. 342.

117 *ibid*., p. 348.

118 *ibid*., p. 349 and Darwin quoted J. G. Veitch, 'Extracts from J. G. Veitch's Letters', *Gardeners' Chronicle and Agricultural Gazette,* 50 (15 December, 1860), 1104 that Japanese women considered European whiskers 'very ugly, and told us to cut them off, and be like Japanese men'.

119 Darwin, *Descent*, 1st edn (1871), I, p. 25.

120 Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 600.

Skin Colour

Darwin thought that the evidence for skin colour resulting from sexual selection was wanting, but he believed that 'of all the differences between the races of man, the colour of the skin is the most conspicuous and one of the best marked.'[121] He dismissed the idea that it is related to different climates and tentatively introduced the idea of sexual selection:

> We know, however, from the many facts already given that the colour of the skin is regarded by the men of all races as a highly important element in their beauty; so that it is a character which would be likely to have been modified through selection, as has occurred in innumerable instances with the lower animals.[122]

Darwin considered two theories, one that skin and hair colour 'is sometimes correlated in a surprising manner with a complete immunity from the action of certain vegetable poisons, and from the attacks of certain parasites'.[123] The second was that a dark skin could save it from being burnt but Darwin said that he was unable to judge whether this was the case.[124]

This was followed by his recognition that black skin could be beautiful but this enlightened view was then undermined by comparing a black person to a Saki monkey:

> It seems at first sight a monstrous supposition that the jet-blackness of the negro should have been gained through sexual selection; but this view is supported by various analogies, and we know that negroes admire their own colour. [...] The resemblance to a negro in minature [*sic*] of *Pithecia satanas* with his jet black skin, white rolling eyeballs, and hair parted on the top of his head, is almost ludicrous.[125]

He pointed out that 'negroes' regarded Mungo Park's white skin and long nose as 'unsightly and unnatural conformations'.[126] The African Moors, also 'knitted their brows and seemed to shudder' at the whiteness of his skin. Darwin pointed out that on seeing Richard Francis Burton (1821-1890, British explorer, translator and orientalist) the black boys of the eastern coast of Africa cried out: 'Look at the white man; does he not look like a white ape?' On the western coast of Africa, a very black skin was admired more than a lighter tint and Darwin suggested 'their horror of whiteness may be attributed, [...] partly to the belief held by most negroes that demons and spirits are white, and partly to their thinking it a sign of ill-health'. The association of certain colours and traits with despised

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121 The evidence he was looking for was a marked variation in skin colour between the sexes. Darwin, *Descent*, 1st edn (1871), I, p. 241.

122 *ibid*., II, p. 381.

123 *ibid*., I, p. 242. One modern theory about why our body hair became finer is that it is easier to see, feel and remove parasites, see Mark Pagel and Walter Bodmer, 'A Naked Ape Would Have Fewer Parasites', *Proceedings of the Royal Society,* 270 (9 June, 2003), S117-S19.

124 Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 196.

125 Darwin, *Descent*, 1st edn (1871), II, pp. 381-82.

126 The remaining quotations in this paragraph are from *ibid*., pp. 346-47. Mungo Park (1771-1806) was a Scottish explorer of the African continent.

or ludicrous animals and objects was shown in China when the wife of the English ambassador was described as having the white teeth of a dog and the rosy colour of potato flowers. On balance, Darwin regarded skin colour as sexually selected and a sign of beauty but one that resulted in extreme and opposed reactions from different races.[127]

The Beard

From 1850 to the 1890s, facial hair became fashionable in Britain, with the exception of aesthetes who believed that a clean-shaven face was more aesthetic.[128] Sexually selected characteristics are subject to fashion and it can be argued that they are the prime sites to express taste, as they are the most noticed. It has been suggested that the transition from bushy sideburns to full beards in 1850 was the result of a cultural change from the beard as a symbol of radicalism and anarchy to a symbol of masculinity, and the smooth face then became a sign of effeminacy.[129]

Darwin thought the hair on the human foetus suggested that at one stage both men and women were hairy and that both had beards but only men retained the beard, and only in some races, through sexual selection. He thought women lost their beards when their bodies became 'completely divested of hair'.[130] The variability in the beard across races indicated to Darwin that reversion, later called degeneracy, had taken place. Then later female sexual selection resulted in the variability of male facial hair and to accentuate the feature 'men of the beardless races take infinite pains in eradicating every hair from their faces' while 'men of the bearded races feel the greatest pride in their beard'.[131] He wrote:

> As far as the extreme intricacy of the subject permits us to judge, it appears that our male ape-like progenitors acquired their beards as an ornament to charm or excite the opposite sex, and transmitted them to man as he now exists. The females apparently were first denuded of hair in like manner as a sexual ornament; but they transmitted this character almost equally to both sexes.[132]

He is therefore suggesting mutual sexual selection. Females are selecting males for the beauty of their facial hair or lack of it, and males are selecting females for their hairless bodies. However, male beards are strongly gender specific but racially or even tribally

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[127] The link between rickets, vitamin D deficiency and sunshine was not widely acknowledged until the 1920s (even though it was first noted in the 1820s). This link suggests that pale skins may have evolved because they generate more vitamin D from weaker sunshine than dark skins. This would imply that Darwin was wrong and that skin colour is not sexually selected but it arises through natural selection, and so the racial preferences for skin colour that Darwin found would arise from identification, familiarity and local culture.

[128] '[...] after 1850 the beard movement in Britain began', Christopher Oldstone-Moore, 'The Beard Movement in Victorian Britain', *Victorian Studies,* 48:1 (Autumn, 2005), 7-34 (p. 7).

[129] *ibid*., p. 10 and T. S. Gowing, *Philosophy of Beards: A Lecture Physiological Artistic & Historical* (London: J. Haddock, 1850).

[130] Darwin, *Descent*, 1st edn (1871), II, p. 379.

[131] *ibid*., p. 380.

[132] *ibid*., p. 383.

dependent, indicating that sexual selection can operate rapidly as the recent out-of-Africa theory suggests the dispersal was about 60,000 years ago.

Darwin also pointed out that some monkeys have beards, whiskers or moustaches and he believed that: 'The early progenitors of man were no doubt once covered with hair, both sexes having beards.'[133] Later in *Descent* he speculated that the 'immense beard of the male Pithecia' could be to protect it during fighting as many monkeys attack each other by the throat, but he also thought it more likely that it developed as a sexual characteristic rather than through natural selection.[134] The beard shows all the signs of being sexually selected as children do not have beards and it develops during puberty only in males.[135]

The loss of the beard is a late evolutionary development and so a beard appears to be an example of reversion to a 'long lost character' before our hairlessness evolved.[136] This type of degeneracy Darwin noted is also found in 'idiots' who are very hairy and are apt to revert in other characteristics. He also explained in a footnote that crossed races are 'eminently liable to revert to the primordial hairy character of their early ape-like progenitors.'[137] An interesting conclusion given that the Fuegan 'savages' are described as almost entirely hairless whereas Europeans have full beards. Darwin dismissed this 'partial reversion' as of a minor nature as he thought 'characters which have long been inherited are always apt to return' and at the end of the paragraph he dismissed it further as extremely variable and not remarkable.[138] It is interesting to speculate on what Darwin would have written if Europeans had been hairless and other races had beards. He also explained men's beardless state based on the inheritance of a habit when he wrote: 'It is also possible that the long-continued habit of eradicating the hair may have produced an inherited effect.'[139] As I have pointed out, this and other Lamarckian arguments appear more frequently in his later work and this quotation is from the second, 1874, edition of *Descent*. The beard was a complex symbol with conflicting associations from anarchy to the military, from a positive symbol of heroism to racial reversion and from masculinity to female power.

The beard was created by females selecting males and this example of female power was reinforced by measurements of males and females, which showed male measurements differ more from one another than female measurements, indicating to Darwin that 'it is the males which have been chiefly modified through sexual selection'

[133] Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 160.
[134] *ibid*., pp. 531-32.
[135] *ibid*., p. 557.
[136] Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 603.
[137] *ibid*., p. 602, footnote 23.
[138] Darwin, *Descent*, 1st edn (1871), II, pp. 378-79.
[139] Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 603.

and therefore it is the females that have been responsible for the majority of mate selection.[140] Darwin gave examples of races without beards, with scant beards or with beards that developed late in life, and races that varied enormously in male hairiness often in close geographic proximity, showing that female preferences were fickle, active and widespread.

Finally, Darwin is known for his full beard. He grew a beard on the *Beagle*, no doubt for practical reasons, and he wrote to his father to ask him to tell his nanny, Nancy that he looked like a 'worthy Solomon'.[141] His father wrote back to say that he had told Nancy that Darwin now looked like an 'old Jew' and Nancy had 'burst out crying'.[142] When he returned he shaved off the beard but grew it again many years later. The first photograph of him with a beard was taken by his son in 1864 when he was fifty-five. The beard was first mentioned in a letter to his eldest son William on 4 July 1862 when he wrote: 'Mamma [Emma] says I am to wear a beard.—I am better.'[143] This comment is thought to refer to the cosmetic value of the beard. Later the same year, on 25 December, Mary Butler, a fellow patient at the water treatment spas he attended, wrote to Darwin: 'I dont like the idea of your long beard. M^{r}. Davenport who is here—wears one from the same cause, but he has benefited wonderfully from the frequent use of the Turkish Bath—& is beginning to look perfectly handsome.'[144] 'The same cause' is taken to refer to the eczema he mentioned to J. D. Hooker in his letter of 30 June 1862. As Janet Browne points out, his beard was 'a bonus for cartoonists' as it became easy to turn his hairiness into animal fur and add a tail to create the perfect caricature of modern man demonstrating his ape origins.[145]

The Female Posterior

In 1810, a young woman called Saartje Baartman from the Quena tribe in South Africa was exhibited naked in sideshows in England and France, and curiosity seekers paid to stare and to ridicule what were regarded as physical characteristics that provided evidence of the inferiority of the black race.[146] Darwin referred to the posterior of 'Hottentot women' in *Descent*:

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140 Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 560.
141 Letter from Charles Darwin to E. C. Darwin, 'Grown a Beard', 6 April 1834, East Falkland Isd..
142 Letter from C. S. Darwin to Charles Darwin, 'Nancy Burst out Crying', 30 September 1834, Shrewsbury.
143 Letter from Charles Darwin to William Darwin, 'I Am to Wear a Beard', 4 July 1862, Down House.
144 Letter from Mary Butler to Charles Darwin, 'Darwin Grew a Beard to Hide His Eczema', 25 December 1862, Sudbrook Park, Petersham.
145 Browne, *Charles Darwin: Power of Place* (2003), p. 377. For example, the caricature 'A Venerable Orang-Outang. A Contribution to Unnatural History', *The Hornet,* 22 March 1871.
146 'The Hottentot Venus Is Going Home', *Journal of Blacks in Higher Education,* 35 (Spring, 2002), 63.

> It is well known that with many Hottentot women the posterior part of the body projects in a wonderful manner; they are steatopygous; and Sir Andrew Smith is certain that this peculiarity is greatly admired by the men. He once saw a woman who was considered a beauty, and she was so immensely developed behind, that when seated on level ground she could not rise, and had to push herself along until she came to a slope. Some of the women in various negro tribes have the same peculiarity; and, according to Burton, the Somal men 'are said to choose their wives by ranging them in a line, and by picking her out who projects farthest a tergo. Nothing can be more hateful to a negro than the opposite form.'[147]

Hottentot is now regarded as a derogatory term as it means 'mumbling' in the language of the Khoikhoi (literally 'real people') people. Khoikhoi women also had elongated genitalia but this could not be referred to directly by Darwin so he added a footnote in Latin, part of which read:

> Idem illustrissimus viator dixit mihi præcinctorium vel tabulam fœminæ, quod nobis teterrimum est, quondam permagno æstimari ab hominibus in hâc gente.[148]

Although the *Dublin Review* and the *Westminster Review* praised Darwin's propriety and modesty, an American writer pointed out that 'so many young women learn nothing of house-keeping but much of Latin,' the issue being that the book could be read by women and references to genitalia, albeit indirect, could offend their sensibilities.[149] Ironically, Elizabeth Helme deleted numerous references to the genitalia of Hottentot women when she translated the first account in the 1790s as it 'would ill accord with the delicacy of [a] female translator'.[150] The Khoikhoi posterior is a significant example of both sexual selection and the localised development of a sexual characteristic through male selection based on the beauty of a particular feature. It can be seen as the counterpoint of the beard, which is a localised characteristic that developed because of female selection. The two characteristics demonstrate that humans are unusual animals in that both sexes engage in selection and both have sexual characteristics. As mentioned earlier, selection is normally carried out by the sex that is committing the most resources, suggesting that in humans the male is also making a long-term commitment to child rearing.

The attraction of the extended posterior in Victorian England is illustrated by the fashion for the bustle, which evolved from the crinoline in the late 1860s and again became popular in 1881 until the early twentieth century. This shows a connection between 'savage' and polite society through an attractive characteristic that gradually evolved over many generations becoming a mechanical construction that simulated the genuine feature.

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147 Darwin, *Descent*, 1st edn (1871), II, pp. 345-46.

148 'The famous explorer told me that the very girdle or protuberance on women which we see as repulsive is thought to be of considerable value by the men of the tribe.' Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 8, footnote 10. The extended genitalia may have been the result of manipulation rather than sexual selection.

149 Dawson, *Darwin, Literature and Victorian Respectability* (2007), p. 40.

150 *ibid*., p. 39.

The Ear

Darwin referred to ‘one little peculiarity in the external ear’ which Thomas Woolner (1825-1892) investigated in his models and in members of the public.[151] Woolner was one of the founding members of the Pre-Raphaelite Brotherhood, and his attention was first called to the subject by Darwin:

> [...] whilst at work on his figure of Puck, to which he had given pointed ears. He was thus led to examine the ears of various monkeys, and subsequently more carefully those of man. The peculiarity consists in a little blunt point, projecting from the inwardly folded margin, or helix. When present, it is developed at birth, and, according to Prof. Ludwig Meyer, more frequently in man than in woman.[152]

Darwin’s conclusion was that the point was a vestige of formerly pointed ears (Figure 23). This aspect of the human anatomy was one that was respectable and it led to ‘an amusing diversion at middle-class dinner parties’.[153] Paul Barlow described this anatomical feature and the relationship between Darwin and Woolner in ‘Grotesque Obscenities: Thomas Woolner's Civilization and its Discontents’.[154]

One interesting aspect of the debate was the extent to which it became associated with the search for elves and fairies. The search for a race of small people that had inhabited Europe until recent times became the subject of scientific investigation.[155] The scientific method was seen as a powerful tool that could be applied to any problem including finding an explanation for why folk stories involving fairy-like creatures are found across many societies and races. The example of fairies shows how the choice of what appears to be a valid area for scientific investigation is culturally determined. The then recent discovery of more tribes of pygmies around the world fuelled speculation that similar tribes in Europe had given rise to the legends of fairies and elves.[156] The interest in fairies and elves pre-dated Darwin’s discovery and references to the word ‘fairy’ saw a steady increase from 1820 to the end of the century with the

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151 Darwin, *Descent*, 1st edn (1871), I, p. 22.

152 *ibid*.

153 Dawson, *Darwin, Literature and Victorian Respectability* (2007), p. 30.

154 *Victorian Culture and the Idea of the Grotesque*, ed. by Colin Trodd, Paul Barlow, and David Amigoni (Aldershot: Ashgate, 1999), pp. 97-118.

155 ‘[...] the legend of elves, trolls, and fairies in Germany could only be explained by the existence of a dwarf race in Europe’, see D. Gath Whitley, 'Present Dwarf Races and Prehistoric Pigmies', *London Quarterly Review,* 12:1 (July, 1904), 139-52 (p. 150). David MacRitchie, *Fians, Fairies, and Picts* (London: Kegan Paul, Trench, Trübner, 1893) shows the existence of a race of prehistoric pigmies in Great Britain and that fians and fairies were identical and that picts were dwarfs and were the same as fairies. One significant advocate of the historic accuracy of legends of little people in Europe was Charles Kingsley who wrote to Darwin about the subject. Letter from Charles Kingsley to Charles Darwin, 'Concerning Elves, Fairies and Dwarfs', 31 January 1862, Eversley Rectory, Winchfield.

156 The term ‘pygmy’ is now regarded as offensive by some but there is no alternative acceptable word for those races whose average height is below 1.5 metres, a common definition. Races can be described by their tribal names such as the Aka, Efe and Mbuti of central Africa but there are also tribes who fall within this definition in the Andaman Islands, Malaysia, Thailand, Indonesia, the Philippines, Papua New Guinea, Brazil and Bolivia.

percentage of references more than doubling.[157] The photographs of fairies taken in Cottingley by Elsie Wright and Frances Griffiths in 1917 (Figure 24) represented a view of the world that was unseen but endorsed as genuine by Arthur Conan Doyle (1859-1930), demonstrating that the link between creative photographic constructions and science was negotiated by the viewer.[158]

The Face

The area of the human body that compresses the most information into the smallest area is the human face. Aspects such as the beard, skin colour and the hairless skin have been mentioned as examples of sexual selection, but the face itself is the primary area for selection. Darwin mentioned that various ornaments of the face are found attractive and in:

> […] savage races of man various hideous deformities—deep scars on the face with the flesh raised into protuberances, the septum of the nose pierced by sticks or bones, holes in the ears and lips stretched widely open—are all admired as ornamental.[159]

The teeth are also shaped and filed or even extracted. 'The wife of the chief of Latooka told Sir S. Baker that Lady Baker "would be much improved if she would extract her four front teeth from the lower jaw, and wear the long pointed polished crystal in her under lip."'[160] Darwin made it clear that even if his readers found the thought of face ornaments hideous they were considered beautiful locally. He described how one tribal chief was asked why the women wore a pelelé, a large metal and bamboo disk, through their upper lips: 'Evidently surprised at such a stupid question, he replied, "For beauty! They are the only beautiful things women have; men have beards, women have none. What kind of a person would she be without the pelelé? She would not be a woman at all with a mouth like a man, but no beard."'[161]

The face is also the primary site for expressing emotion, and the various human emotions and their physiological basis are discussed at length by Darwin in *Expression*. Francis Galton (1822-1911), Darwin's half-cousin, believed that physical appearance could be used as a tool of medical diagnosis and more generally as a way of categorising types.[162] In his presidential address to the Anthropology Section of the British Association in 1877, he proposed a way of blending photographs to determine the typical appearance

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[157] Google Ngram search on 'fairy'. The number of references rose from about 0.0004 percent to 0.0009 percent.
[158] It was not until the 1980s that Elsie Wright wrote a letter admitting to the hoax.
[159] Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 426.
[160] *ibid*., p. 576.
[161] Darwin, *Descent*, 1st edn (1871), II, p. 342.
[162] Galton and Darwin shared the same grandfather, Erasmus Darwin, but had different grandmothers.

of each type. Galton noticed that in these blended photographs the faces looked more attractive. He pointed out in an article in the *Journal of the Anthropological Institute*, that Darwin had received a letter dated 6 November 1877 from A. L. Austin in New Zealand saying that when he superimposed photographs of ladies there was in 'in every instance, a *decided improvement* in beauty'.[163] In 1883, he published *Inquiries in Human Faculty and its Development* in which he coined the terms 'composite photograph' and 'eugenics' as part of his work on categorising people by personality, disposition, class and race. The basis of the approach has long been discredited but recent research into facial beauty has used a similar technique of facial averaging to show that the average face is regarded as more attractive, partly perhaps because of its symmetry, which has also been found to be associated with beauty.[164] The close link between an average face and an attractive face is discussed with respect to Galton's research on page 162.

Female Choice

If certain male sexual characteristics, such as the beard, are the result of female choice then Darwin was aware that he had to show that women were in a position to be selective for a period long enough to bring about such a change. This also raised the issue of accepting that women were not passive but were actively involved in sexual selection and mate choice. Darwin's solution to these less than respectable implications was to develop the idea of 'coyness' and to distinguish between Western European women and other races. Darwin wrote:

> The female, on the other hand, with the rarest exceptions, is less eager than the male. As the illustrious Hunter long ago observed, she generally "requires to be courted;" she is coy, and may often be seen endeavouring for a long time to escape from the male. [...] the female, though comparatively passive, generally exerts some choice and accepts one male in preference to others. Or she may accept, as appearances would sometimes lead us to believe, not the male which is the most attractive to her, but the one which is the least distasteful. The

[163] Francis Galton, 'Composite Portraits', *Journal of the Anthropological Institute* (1879), 132-44 (p. 137). As Galton points out it is another of the many 'curious instances' of two persons simultaneously and independently engaged in the same 'novel inquiry' reaching 'similar results'.

[164] Victor S. Johnston, 'Mate Choice Decisions: The Role of Facial Beauty', *Trends in Cognitive Sciences,* 10:1 (2006), 9-13, Doug Jones et al., 'Sexual Selection, Physical Attractiveness, and Facial Neoteny: Cross-Cultural Evidence and Implications', *Current Anthropology,* 36:5 (December, 1995), 723-48, Masashi Komori, Satoru Kawamura, and Shigekazu Ishihara, 'Averageness or Symmetry: Which Is More Important for Facial Attractiveness?', *Acta Psychologica,* 131:2 (2009), 136-42, D. I. Perrett, K. A. May, and S. Yoshikawa, 'Facial Shape and Judgments of Female Attractiveness', *Nature,* 368:6468 (Mar, 1994), 239-42 and Thornhill and Gangestad, 'Facial Attractiveness', *Trends in Cognitive Sciences,* 3:12 (1999), 452-60 are a few of the recent papers.

> exertion of some choice on the part of the female seems a law almost as general as the eagerness of the male.[165]

Darwin made the idea of female choice respectable by turning it into a passive activity. He maintained that each woman is coy and 'requires to be courted' and will end up not with the man who is the 'most attractive to her' but 'the least distasteful.' Later in *Descent* Darwin extended this idea of passive selection by introducing the idea of a human lek:

> If an inhabitant of another planet were to behold a number of young rustics at a fair, courting and quarrelling over a pretty girl, like birds at one of their places of assemblage, he would be able to infer that she had the power of choice only by observing the eagerness of the wooers to please her, and to display their finery.[166]

As well as explaining how sexual selection might work with humans in a way that did not disturb his readers' prejudices concerning the passivity of the woman's role, he also had to persuade the reader that birds are able to make a choice. Darwin argued that humans are formed by the same or similar selective pressures to other animals and other animals demonstrate, if only to a limited extent, the same capabilities as humans. He wrote:

> Now with birds, the evidence stands thus: they have acute powers of observation, and they seem to have some taste for the beautiful both in colour and sound. It is certain that the females occasionally exhibit, from unknown causes, the strongest antipathies and preferences for particular males.[167]

He also made it clear that sexual selection is a strong force that runs counter to natural selection and the 'survival of the fittest'. Essentially Darwin showed that beauty is a more powerful force than death. He explained it as follows:

> Even well-armed males, who, it might be thought, would altogether depend for success on the law of battle, are in most cases highly ornamented; and their ornaments have been acquired at the expense of some loss of power. In other cases ornaments have been acquired, at the cost of increased risk from birds and beasts of prey.[168]

The peacock's tail shows that over many generations its beauty and therefore its ability to attract a mate was more significant than the death of more birds because of the visibility of their extravagant tails to predators. Darwin was also concerned with how to equate the aspects of female choice left to the 'coy female' with the conventions of Victorian wooing. Unless he could demonstrate that the choice was actually made then his argument would

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165 Darwin, *Descent*, 1st edn (1871), II, p. 273. Darwin is quoting *Essays and Observations on Natural History, Anatomy, Physiology, Psychology, and Geology by John Hunter*, ed. by Richard Owen, 2 vols (London: John van Voorst, 1861), I, p. 194. This is another example of Darwin's self-censorship as Hunter wrote 'the female is not so desirous for copulation as the male.' Also see Dawson, *Darwin, Literature and Victorian Respectability* (2007), p. 222. Although Darwin is discussing all animals he makes it clear this includes humans as two pages later he gives an example of the greater range of variation found in men.

166 A lek is the biologist's name for the location where a group of male birds parade before the females to be selected. The peafowl is a lekking bird. Darwin, *Descent*, 1st edn (1871), II, p. 122, see page 262.

167 *ibid*., pp. 122-23.

168 *ibid*., p. 123.

fail regarding human sexual selection. He started the section on 'The Influence of Beauty in determining the Marriages of Mankind' as follows:

> In civilised life man is largely, but by no means exclusively, influenced in the choice of his wife by external appearance; but we are chiefly concerned with primeval times, and our only means of forming a judgment on this subject is to study the habits of existing semi-civilised and savage nations. If it can be shewn that the men of different races prefer women having various characteristics, or conversely with the women, we have then to enquire whether such choice, continued during many generations, would produce any sensible effect on the race, either on one sex or both according to the form of inheritance which has prevailed.'[169]

He first distinguished between civilized life and 'primeval times' when he needed to show that men preferred certain characteristics in women, and equally, as he wrote rather awkwardly: 'conversely with the women'. He went on to explain how he saw sexual selection working in civilized society:

> Civilised men are largely attracted by the mental charms of women, by their wealth, and especially by their social position; for men rarely marry into a much lower rank of life. The men who succeed in obtaining the more beautiful women, will not have a better chance of leaving a long line of descendants than other men with plainer wives, with the exception of the few who bequeath their fortunes according to primogeniture.[170]

He is here arguing that beauty is not important and that those who select a beautiful but poorer wife will only be successful if their estate is not distributed between all the children. He continued by arguing that the aristocracy are more beautiful:

> Many persons are convinced, as it appears to me with justice, that the members of our aristocracy, including under this term all wealthy families in which primogeniture has long prevailed, from having chosen during many generations from all classes the more beautiful women as their wives, have become handsomer, according to the European standard of beauty, than the middle classes; yet the middle classes are placed under equally favourable conditions of life for the perfect development of the body.[171]

The reason he mentioned 'primogeniture' is that it ensured a stable breeding programme over hundreds of years. All the wealth passed to the eldest son who was then in a position to choose the most beautiful wife and this process continued over many generations. The final point he made was to dismiss the argument that their beauty was due to 'better food and manner of life' because, he argued, the middle classes are equally favoured but less beautiful. In a letter to Wallace, Darwin made the same point when he wrote: 'Our aristocracy is handsomer (more hideous according to a Chinese or Negro) than middle classes from pick of women; but oh what a scheme is primogeniture for destroying N. Selection.'[172] Wallace considered that Darwin was wrong on this point and

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[169] *ibid*., p. 338.
[170] *ibid*., pp. 355-56.
[171] *ibid*., p. 356.
[172] Letter from Charles Darwin to Alfred Russel Wallace, 'Aristocracy and Primogeniture', 28 [May] [1864], Down, Bromley, Kent. His comment on primogeniture is probably a reference to a system that allows the weak to survive and he is not treating beauty as an indicator of fitness.

that he had been influenced by the power and charisma of wealthy families.[173] Wallace was born into a poor family and developed strong socialist views early on. He also differed from Darwin on many others aspects of their theory. He regarded sexual selection as a minor factor and in his book *Darwinism* he showed how the attributes that Darwin explained using sexual selection could be explained by natural selection.[174] Later, Wallace became a Spiritualist and rejected an evolutionary explanation for human attributes such as intelligence, self-consciousness and emotions, and he believed that the universe has a direction that will lead to the perfection of humanity and a socialist utopia.

If selection based on beauty had largely stopped in civilized society, Darwin had to demonstrate that it had taken place in earlier periods. He started by listing all the social circumstances that would prevent sexual selection in 'savage' societies, namely, communal marriages or promiscuous intercourse; female infanticide; early betrothals; and women who are held as slaves. He pointed out that 'As far as sexual selection is concerned, all that is required is that choice should be exerted before the parents unite, and it signifies little whether the unions last for life or only for a season.'[175] In other words, the important thing for sexual selection to operate is selection for beauty and having children as a result, not marriage. He added that polyandry, where a woman has two or more husbands, meant that all the women would marry and so there would be no male selection in operation but 'the women no doubt will have the power of choice, and will prefer the more attractive men'.[176] Darwin went on to argue:

> With respect to the opposite form of selection, namely of the more attractive men by the women, although in civilised nations women have free or almost free choice, which is not the case with barbarous races, yet their choice is largely influenced by the social position and wealth of the men; and the success of the latter in life depends much on their intellectual powers and energy, or on the fruits of these same powers in their forefathers.[177]

In other words, except for the aristocracy, in civilized society sexual selection was not based on physical beauty. In the case of the aristocracy, where male selection was based on female beauty he believed the women were more beautiful.

Darwin also engaged in what we would now call 'Just So' stories when he speculated on the nature and structure of primeval societies.[178] He painted a picture of a

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[173] Browne, *Charles Darwin: Power of Place* (2003), p. 306. For Darwin's earlier comments on inheritance by the first-born, and on the English aristocracy, see Letter from Charles Darwin to John Stevens Henslow, 'Destroying Primogeniture', 25 July 1845, Down, Bromley, Kent, and Letter from Charles Darwin to J.D. Hooker, 'Primogeniture Opposed to Selection', 25 January [1862], Down, Bromley, Kent. See also Darwin, *Descent*, 1st edn (1871), I, p. 170.
[174] Wallace, *Darwinism* (1889), p. 283.
[175] Darwin, *Descent*, 1st edn (1871), II, p. 360.
[176] *ibid*., p. 366.
[177] *ibid*., p. 356, see page 274.
[178] Kipling wrote *Just So Stories for Little Children* (1902) containing highly fantasised origin stories such as 'How the Camel Got His Hump'.

society in which the powerful males attracted one or more of the most attractive women and because they would have had little foresight they would have had large families, but love of their young offspring would have prevented female infanticide. Women would therefore not be scarce and so polyandry would not be practised. There would be no early betrothals and 'women would not have been valued as mere slaves; both sexes, if the females as well as the males were permitted to exert any choice, would have chosen their partners, not for mental charms, or property, or social position, but almost solely from external appearance.'[179] Darwin also believed: 'The most powerful and able males would have succeeded best in the struggle for life and in obtaining attractive females.'[180] He then made his case based on the analogy between a chief selecting his wives and a breeder selecting his animals based on the 'character of his own mind—his own taste and judgment'.[181] He predicted that similar results should follow 'from the long-continued selection of the most admired women.' Darwin then connected the beauty of women who are 'everywhere conscious of the value of their beauty' with ornamentation to enhance their beauty using 'the plumes of male birds' that nature has used elsewhere to 'charm the females' being used to charm the male.[182]

As men are selecting women, 'it is not surprising that some of their successive variations should have been transmitted exclusively to the same sex'.[183] However, Darwin also recognized that women 'certainly transmit most of their characters, including some beauty, to their offspring of both sexes'.[184] He described how it is not just male choice but even in Africa where 'girls are severely beaten by their fathers if they will not accept a chosen husband' they are still able to exert their choice and:

> [...] very ugly, though rich men, have been known to fail in getting wives. The girls, before consenting to be betrothed, compel the men to shew themselves off first in front and then behind, and 'exhibit their paces.' They have been known to propose to a man, and they not rarely run away with a favoured lover.[185]

Darwin therefore manages to describe the process of female sexual selection in a way that is within the limits of the acceptable within Victorian society. He first separated Victorian society from 'savage' society and then painted a picture of a 'savage' society in which the women select the most attractive male through a process that ranges from passive acceptance of 'the least distasteful' to the possibility of elopement.

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[179] Darwin, *Descent*, 1st edn (1871), II, p. 368.
[180] *ibid*., p. 367.
[181] *ibid*., p. 370.
[182] *ibid*., pp. 371-72.
[183] Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 597.
[184] *ibid*.
[185] *ibid*., p. 598.

Simple Beauty

The beauty of nature is a complex combination of simple and cultural beauty. As Darwin pointed out, landscape art depends on culture and we know that it has only been an independent genre since about the fourteenth century. We find beauty in the colours, rhythm and symmetry of nature and Darwin identified this as an important component of all beauty. We also find beauty in nature in the colour and forms of trees, flowers, birds and other animals. Part of this beauty results from their symmetry and colour and part from the fact that they evolved to attract a pollinator or a mate. Darwin explained that our common ancestry and therefore our common neural structures will result in our appreciation of similar forms. There is a clear distinction between the simple beauty of a shell and a peacock's tail but both incorporate simple beauty.

Why do we find plants and other animals beautiful? Darwin argued that plants have evolved flowers to attract insects for pollination.[186] Flowers have evolved to be noticed and attract by their bright colours and Darwin recognized that we find bright colours and symmetrical patterns beautiful. However, as we have seen he assigned no reason why this should be the case.

Darwin argued that we find some other animals beautiful because we share a common ancestry and a common nervous system. He regarded our common ancestry as the explanation of why men and women ornament themselves with bird feathers. Other species create objects for the aesthetic pleasure of their potential mates. He wrote: 'the Bower-birds by tastefully ornamenting their playing-passages with gaily-coloured objects, as do certain humming-birds their nests, offer additional evidence that they possess a sense of beauty.'[187] That is, although 'for the great majority of animals' beauty is confined to the appreciation of the opposite sex, in some it is the abstract appreciation of the beauty of an object that has been created to be appreciated. The constructions made by bowerbirds are not nests but are created to compete aesthetically and attract a mate based on their appreciation of form, colour and materials. Such constructions are part of what is sometimes called the extended phenotype, which can evolve through the same mechanism of sexual selection. Humans may be like bowerbirds and have evolved an appreciation of the beauty of certain colours and forms as part of sexual attraction and selection. This would suggest that one reason for art is to attract the opposite sex but Darwin never reached this conclusion.

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[186] 'Hence we may conclude that, if insects had not been developed on the face of the earth, our plants would not have been decked with beautiful flowers', Darwin, *Origin*, 6th edn (1872), p. 161.

[187] Darwin, *Descent*, 1st edn (1871), I, p. 63. In the second edition this was changed to 'they must receive some kind of pleasure from the sight of such things', Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 92.

Darwin discussed what he called 'beauty in its simplest form', which is 'the reception of a peculiar kind of pleasure from certain colours, forms, and sounds' and he regarded it as 'a very obscure subject'.[188] It is the feeling we have towards an organic or inorganic structure to which sexual selection does not apply. One reason Darwin gave for this feeling is an appreciation of symmetry. He wrote: 'The beauty in this latter case, and in many others, is apparently wholly due to symmetry of growth.'[189] He also recognized that 'mere repetition of parts is to our eyes one main element of beauty.'[190] This explanation accounts for our seeing beauty in, for example, fossilised ammonites or microscopic diatoms. In his notebooks, he also speculated about other attributes that give rise to the feeling of beauty such as 'intense colour, or two tints in harmony'.[191]

Darwin described this type of beauty more fully in his Notebook M where he listed four causes for the pleasure from scenery—the harmony of colours, form, warmth and the imagination.[192] The pleasure from the harmony of colours is based on their 'absolute beauty' particularly the 'splendour' of coloured light and the 'mere exercise of the organ of sight'. The pleasure of form derived from certain shapes which are 'instinctively beautiful' and from perspective, such as 'serpentine lines [that] narrow in the distance' and 'two waving *perfectly parallel'* lines on paper, as well as the beauty in rhythm and symmetry found in seaweed, trees and other plants. Darwin specifically described the beauty of the leaves of a tree as resulting either from their absolute form or from the repetition of similar forms, such as in 'angular leaves'. As we saw earlier, he referred to Humboldt's analysis of rhythmical beauty in Mexican and Greek sculpture.[193] He may also have been thinking of his grandfather's analysis of the sublimity of a Grecian temple and 'waving or spiral lines' that resemble 'the form of a female bosom' which when found in a landscape or 'some antique vases' give us a 'general glow of delight'.[194]

Darwin did not regard beauty as an absolute, metaphysical entity and so he tried to explain why we and other animals find colours and symmetry beautiful, but concluded that it is simply 'some fundamental cause in the constitution of the nervous system in each species'.[195] However, because of our common ancestry, Darwin did see a

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188 Darwin, *Origin*, 6th edn (1872), p. 162.
189 *ibid*., p. 161.
190 Letter from Charles Darwin to G.H.K. Thwaites, 'How Can Natural Selection Produce Beauty?', 21 March [1860], Down Bromley Kent
191 Darwin, *Notebook M*, p. 32 and *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters*, ed. by Darwin and Seward, p. 194.
192 Darwin, *Notebook M*, pp. 36-41. The other quotations in this paragraph are from the same pages unless otherwise indicated.
193 Alexander Humboldt, *Political Essay on the Kingdom of New Spain*, trans. by John Black, 4 vols (London: Longman, Hurst, Rees, Orme, and Brown, 1811), Darwin owned a copy signed 'Charles Darwin, Buenos Ayres'.
194 Darwin, *Zoonomia* (1794), p. 145.
195 Darwin, *Origin*, 6th edn (1872), p. 162.

connection between all animals and this could provide a materialistic explanation for a built-in universal appreciation of beauty. Darwin wrote:

> Everyone who admits the principle of evolution, and yet feels great difficulty in admitting that female mammals, birds, reptiles, and fish, could have acquired the high standard of taste which is implied by the beauty of the males, and which generally coincides with our own standard, should reflect that in each member of the vertebrate series the nerve-cells of the brain are the direct offshoots of those possessed by the common progenitor of the whole group. It thus becomes intelligible that the brain and mental faculties should be capable under similar conditions of nearly the same course of development, and consequently of performing nearly the same functions.[196]

This shared appreciation of beauty across the human race and other animals could be seen as the biological basis for universal beauty. This could be regarded as a practical form of absolute beauty, which, unlike Platonic beauty, is contingent rather than metaphysical. The beauty of rhythm and symmetry also suggests that the mathematical analysis of proportions we find beautiful might help uncover fixed relationships that help us to understand better the attributes of simple beauty.

Cultural Beauty

Darwin wrote:

> Obviously no animal would be capable of admiring such scenes as the heavens at night, a beautiful landscape, or refined music; but such high tastes, depending as they do on culture and complex associations, are not enjoyed by barbarians or by uneducated persons.[197]

Some modern evolutionary psychologists have equated the beauty of a landscape with a genetic disposition to be attracted to a location where food could be found, but Darwin simply describes it as complex and dependent on cultural associations.[198] The pleasure of imagination he related to the association with poetry and abstract concepts such as abundance, fertility, rustic life and virtuous happiness. He imagined the train of thoughts that could give pleasure to various people when he wrote:

> The train of thoughts vary no doubt in different people., an agriculturist, in whose mind supply of food was evasive & ill defined thought would receive pleasure from thinking of the fertility. — I a geologist have ill defined notion of land covered with ocean, former animals, slow force cracking surface &c truly poetical. (V. Wordsworth about science being sufficiently habitual to become poetical) the botanist might so view plants & trees. — I am sure I remember my pleasure in Kensington Gardens has often been greatly excited by looking at trees at [i.e. as] great compound animals united by wonderful & mysterious manner.[199]

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[196] Darwin, *Descent*, 1st edn (1871), II, pp. 401-02.
[197] *ibid*., I, p. 64
[198] See Dutton, *The Art Instinct: Beauty, Pleasure, & Human Evolution* (2009), chapter 1, pages 13-28 and *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters*, ed. by Darwin and Seward, pp. 324-7
[199] Darwin, *Notebook M*, pp. 40-41, see page 232.

All these different groups in the same society have different views of beauty based on their personal experience and associations; the agriculturist receiving pleasure from 'thinking of fertility' and the geologist from the 'truly poetical' 'slow force' cracking the surface of the earth, and the botanist who might look at trees as 'great compound animals united by [*sic*] wonderful & mysterious manner'.[200]

Humans appear to have a strong territorial sense at tribal, regional, national and racial levels. Our instinct for beauty or attractiveness means, as Darwin made clear that we are born with built-in prejudices. Beauty and its opposite can thus form the basis of an instinctive stereotyping based on any perceived difference, such as class, race and gender.

It is difficult to separate instinct from culture and it can be misleading to suggest an evolutionary origin for cultural and social constructs. As we have seen, Darwin suggested social structures that might have given rise to existing sexual characteristics and he based these on social practices found around the world including 'savage' societies. However, he was aware of the danger as he also pointed out, when the consequences did not suit his argument, that 'savage' societies around the world today do not help us understand what he called primeval times.

Concluding Remarks

We have seen how Darwin's ideas about beauty were scattered through his notebooks and writings but can be brought together as a consistent theory of beauty. This theory is principally constructed around sexual selection as an explanation of why we find other humans beautiful and why, because of our common ancestry we find related species beautiful. Secondary sexual characteristics evolved to be beautiful; in terms of natural selection they are are pointless and can even be damaging. They are associated with the decorative and ornamental, even with the effeminate. In most species, females choose flamboyant, beautiful males whose ornaments evolved in a capricious and arbitrary manner. This selection implies that conscious choice and rivalry based on appearance are important factors rather than the more socially acceptable attributes of fitness, health and hard work. These and similar issues, which follow from Darwin's theory, were, as we shall see, being explored by artists before Darwin's *Origin* (1859). We will see in later chapters that Darwin's theory of beauty can be used as a practical tool for helping with the analysis of artworks by examining the implications of the secondary sexual characteristics.

[200] *ibid*.

Darwin identified three types of beauty. First, beauty resulting from the 'harmony of colours', 'the splendour of light', some forms, such as ovals, perspective, rhythm, repetition and symmetry, which I call simple beauty; second, sexual beauty, which was implied by his theory of sexual selection; and third, cultural beauty, which was based on learned associations.[201] I have also called the first two the beauty instinct as they are both inherited. All three may be present in a beautiful object, although I focus on sexual selection throughout the thesis, as that was Darwin's primary contribution to aesthetics. The unique contribution made by Darwin was that he provides an explanation for how some types of beauty evolved. As a scientific theory, it is testable and verifiable using scientific methods. Darwin believed that some aspects of beauty, such as a bird's colouration might be seen as beautiful because of our shared heritage and we might also be appreciating the simple beauty of its colouration. Darwin recognized that we find beauty in formal properties, such as colour, proportion and symmetry which suggests that mathematics may play an important part in understanding this type of beauty. He also wrote little about cultural beauty as he regarded it as outside the province of science.

[201] *ibid*., p. 36.

Chapter 3: Nature's Beauty

This chapter will show how Darwin's view of nature and beauty was mirrored by changes taking place in art. Both Darwin and certain artists found value in the uniqueness of individual plants and animals rather than in their general type, common features and similarities. This appreciation of uniqueness and difference is what enabled them to see variation and individuality where others saw just deviation from the norm and a failure to conform to the archetype. They saw that the flexibility and fluidity of natural forms created an ever-changing harmony rather than a static world of divinely created species. They found that their imagination enabled this fluid world of infinite variety to be processed subjectively and it transmuted nature through a lens of memory and subjective feelings. Critics, such as Ruskin, believed that natural forms have a symbolic meaning related to their divine purpose but Darwin and the artists showed that such categories are a human construct and that all symbolic interpretations are culturally assigned.

In the 1840s, Darwin's *Journal* presented the natural world, outside the influence of man, as a wonderful and benign place. The natural world had dangers but such terrors could be associated with the sublime. However, by the early 1860's, new travel tales presented nature as a place of fear and danger. This was associated with the gorilla, an animal that was seen as the brutal progenitor of man and a metaphor for the supressed savage animal within us. By the early 1870s, this had become sublimated into fashion and it was being presented humorously in cartoons. I will show that there was a link between Darwin's ideas and fashion and that Darwin's later work and certain artworks helped rationalize and remove the fear associated with savage nature.

In the mid-Victorian period, artists and scientists were exploring new ways of seeing related to new ways of thinking about the natural world. We do not see the world like a camera because the eye and the brain process information in a way that depends on our previous experience and our visual models.[1] These can change and there were, for example, two radical changes to the way the natural world was represented, as mentioned on page 23. The first was a change from what could be called a picturesque representation in the Romantic tradition, to the hard-edged Pre-Raphaelite representation of microscopic detail including individual variations and the vagaries of disease, damage and decay. This could be seen as analogous to the change in science from amateur observation and categorization to the minute and professional observation and methodical categorization of scientists such as Lyell and Darwin. Science had always

[1] An artist 'begins not with his visual impression but with his idea or concept', E. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation*, 6th edn (London: Phaidon, 2002, first published 1960), p. 73.

been based on observation and measurement but modern science rejected the assumptions of special forces and divine agency and so observation took on a new importance. Darwin's first book was based on his diary written on his voyage on HMS *Beagle*. It shows a young man overwhelmed by the beauty of nature and passionately interested in the microscopic detail of individual objects. This suggests paintings such as Millais's *Ophelia* (1851-52, Figure 20), which shows a similar interest in the microscopic detail of nature and, like a botanical textbook, juxtaposes flowers that would have blossomed at different times of the year. The painting shows that Millais, like Darwin, was interested in the disease and damage to the reeds, unlike a botanical illustration. Darwin's *Journal* also revels in the clarity of vision of mountain landscapes like those represented in Holman Hunt's *The Scapegoat* (1855, Figure 21).[2] These significant changes in artistic representation have been related to scientific observation by writers such as Tim Barringer, Kenneth Bendiner, Kate Flint and Nicola Bown but it was a special type of scientific observation as Hunt and Darwin were interested in the peculiarities of the landscape, its eccentricities, what makes it unique rather than what makes it conventional.[3]

The second change took place at about the same time as Darwin's publication of *Origin* and is exemplified by Millais's *Autumn Leaves* (1856, Figure 1), followed by many other paintings, such as Whistler's *Nocturne: Blue and Gold - Old Battersea Bridge* (1872-77, Figure 2). It was a move away from a carefully observed but unconventional world to one based on the artist's subjective response, the natural world represented through the artist's memory and mood. We shall see how this change relates both to certain passages from Darwin's *Journal* on memory and vision and to the way both Darwin and some artists were providing a new way of looking at the world. Darwin's radical theories provided a cultural justification for many types of revolutionary new ways of viewing the world, labelled by Ruskin and others as materialism.

In the early Victorian period, there was growing uncertainty regarding particular religious beliefs but little dissent from the view that nature was God's creation and so had a divine purpose. Understanding nature was therefore a form of worship that gave meaning to scientific study. Ruskin believed that nature was didactic—every species was created to teach us something and make a moral point. However, the science of geology

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2 Describing mountains, Darwin wrote the 'extreme clearness of the air gives a peculiar character to the landscape; all objects appearing to be brought nearly into one plane, as in a drawing or panorama.' Darwin, *Journal and Remarks* (1839), p. 398.

3 'This way of looking belongs to the nineteenth century, to the era of photography, of empirical science and of botanical classification.', Barringer, *Reading the Pre-Raphaelites* (1998), p. 8, Kenneth Bendiner, 'John Brett's "The Glacier of Rosenlaui"', *Art Journal,* 44:3 (Autumn, 1984), 241-48, Kate Flint, *The Victorians and the Visual Imagination* (Cambridge: Cambridge University Press, 2000), pp. 21-42 and Nicola Bown, *Fairies in Nineteenth-Century Art and Literature* (Cambridge: Cambridge University Press, 2001), pp. 98-162, Chapter 3.

began to raise awkward questions about Earth's longevity and the constancy of geological change and this conflicted with accepted interpretations based on the Bible, which required a short history with catastrophic episodes.[4] *Vestiges* (1844) suggested that humans evolved from apes, which raised questions about our origins but these ideas were tightly constrained within a universe created by God.[5] Darwin undermined this certainty in *Origin* (1859) by describing a mechanism that required no divine intervention and in which he found it necessary only to mention 'God' once in the body of the text and 'divine' not at all.[6]

In parallel with the above development, explorers and scientists were changing the symbolic significance of certain animals for particular social groups. Wild animals represented the unpredictability, danger and otherness of the natural world, which introduced fear or even terror into the contemplation of its beauty. This change in the cultural response to aspects of the natural world, such as the African jungle, was, as we shall see, partly a response to horrific stories of sadistic gorillas. However, it could also be a profound change in our relationship with nature from something that was specifically created for humanity to something that is uncaring, meaningless and deadly. The animal in Whistler's *The White Girl* (1862, Figure 3) has been subdued but it stares out with ferocious intent. Whistler contrasts the grotesqueness of the flayed animal with the purity of the young woman. The grotesque forms of nature were also used to parody the latest fashions as society tried to tame those forms. Edward Sambourne produced a series of illustrations for *Punch* that created nightmares of biological fashion (1871, Figure 4). One review of Tennyson's 'In Memoriam' (1849) thought that he had failed to answer satisfactorily the question he set himself: 'Are God and Nature, then, at strife?' as 'Nature, red in tooth and claw […] shrieks against the creed.'[7] One example of the violence of nature was the 'ape anxiety' of the 1860s when Paul du Chaillu returned from Africa with the remains of a gorilla and horrific stories about how it was believed to embody the spirit of dead people and capture, torture, kill and rape humans.[8] The connection with Darwin would have been clear, as the gorilla became the focus of an argument between Richard

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4 The most significant book describing the new geological idea of uniformitarianism was Lyell, *Principles of Geology: Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes Now in Operation*, 2nd edn (1833).

5 The development of the human embryo was thought to follow the evolution of the species and Chambers wrote of humans: 'one of the last stages of his foetal career, he exhibits an intermaxillary bone, which is characteristic of the perfect ape', Chambers, *Vestiges*, 1st edn (1844), p. 199.

6 He included two short quotations at the beginning of *Origin* that mentioned God, divine and divinity four times in total but the first was to deny the need for divine intervention.

7 'The Poetry of the Period: Roman Catholic Poets', *Temple Bar,* 27:106 (September, 1869), 170-86 (p. 172). *Origin* had not been published but Tennyson may have been influenced by the ideas of evolution in *Vestiges*.

8 Paul Belloni du Chaillu (1835-1903) was a French-American traveller who became famous in the 1860s as the first person to bring dead gorilla specimens back to Europe.

Owen and Thomas Huxley about whether there was a fundamental and unbridgeable gap between humans and apes.[9]

By the 1870s, these fears had been sublimated as animals became fashion items and the peacock was used to symbolize a more benign but idiosyncratic nature. A new focus on beauty was associated with concerns about human sexual display rather than interspecies rape. The artist-centred world had absorbed the nightmare of uncontrolled nature and the life and death struggle of natural selection and re-presented it as the provocative beauty of sexual selection.

Nature Seen through Memory

> It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us.[10]

There are two components to Darwin's vision of nature; the first and most frequently discussed, is his appreciation of the complexity, richness and interdependency of the individual plants and animals.[11] The second, and perhaps more significant, is his belief in unifying laws that explain and connect them to form an interacting system. Darwin regarded his main achievement as finding general laws that tied together all his individual observations.[12] Scientific laws appear to tame nature and they can be seen as a substitute for divine certainty as they keep everything in its place. However, laws give little comfort, as they are human best guesses and do not represent any form of revealed truth. They do not replace religious faith with scientific certainty but instead they undermine all forms of absolute truth.

Darwin's theory describes a process that operates over vast lengths of time and is concerned with individuals and tiny changes. This undermined many assumptions, such as the view that the world is only a few thousand years old, the idea that species are fixed and meaningful and that change is directed towards continual improvement. In a Darwinian world 'species' is a human construct used to try to impose order on a chaotic

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9 The debate was widely reported, for example, Owen's hostile review of *Origin*, [Richard Owen], 'On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life, by Charles Darwin', *Edinburgh Review,* 111:226 (April, 1860), 487-532, the report of the Wilberforce-Huxley debate, 'British Association', *The Athenaeum,* 1707 (14 July, 1860), 59-69 and the publication of Huxley, *Evidence as to Man's Place in Nature* (1863) in which he starts by calling upon a collection of ancient and questionable sources to blur the distinction between man and apes.

10 See page 248 for the full quotation from *Origin*.

11 Beer, *Darwin's Plots*, 3rd edn (2009), p. 159.

12 'My mind seems to have become a kind of machine for grinding general laws out of large collections of facts', Darwin, *The Autobiography of Charles Darwin* (1887), p. 139.

world of individuals. By deconstructing the word ‘species’ Darwin empowered the individual and undermined the notion of absolute knowledge with a consequent undermining of all accepted categories including fixed gender roles, class hierarchy and racial superiority. As mentioned previously, John Dewey believed that Darwin had undermined the basis of knowledge itself by destabilising fixed types and categories.[13] Daniel Dennett (1942) has also argued that Darwin’s ‘dangerous idea’ was a ‘universal acid’ that ate through conventional notions, such as those of moral certainty, beauty and disinterested desire, and left behind a debate that continues.[14]

As Darwin saw the world as processes operating through time, the individual detail of each natural form was not something to be ignored, generalised away or regarded as a deviation from the norm but it was critical evidence for such processes. The complexity of the natural world arises over vast periods through minute changes differentially selected by sexual partners and death. Darwin therefore also brought about a new way of seeing the individual. Each plant and animal has distinguishing features that make it unique. The features that determine an individual are not, in this view of nature, defects, and individuals are not flawed examples of some ideal plant or animal. Each plant and animal is the termination of a long evolutionary process and the uniqueness of each individual is the fundamental strength of the natural world. The impact this had on the notion of perfect beauty is explored in Chapter 5.

It is the representation of the idiosyncratic detail of each individual plant and animal that makes the work of the Pre-Raphaelites so interesting, rather than the detailed representation of idealised or generalised forms. They chose to paint friends and relations with a particularity that was inexplicable to the critics given the context of the painting’s subject, such as the representation of a medieval tale or the Holy Family.[15] The broken, insect eaten and brown reeds in the left foreground of Millais’s *Ophelia* (Figure 20, see detail) take on a new significance as they now indicate that particular plants battle for existence and their ability to survive such attacks is based on millions of generations of ancestors that had to reproduce and pass on their particular hardiness and resistance. Other artists showed the perfect specimen and avoided the idiosyncratic and the unusual

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[13] John Dewy argued that Darwin’s ideas imply ‘nature as directly and practically experienced does not satisfy the conditions of knowledge’ based on ‘ειδος, species, a fixed form and final cause’, see Dewey, *The Influence of Darwin on Philosophy* (1910), p. 6. Many believe that even our thinking is based on the manipulation of relationships between fixed types and categories of things, see Pinker, *The Language Instinct: How the Mind Creates Language* (1994), although it can be argued that the late writings of Wittgenstein, see Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Basil Blackwell, 1972), describing language as a game, undermine such ideas.

[14] ‘[…] note that the memes for normative concepts—for *ought* and *good* and *truth* and *beauty*—are among the most entrenched denizens of our minds.’, D. Dennett, *Darwin’s Dangerous Idea: Evolution and the Meanings of Life* (London: Allen Lane, 1995), p. 50.

[15] See the description of Millais’s *Christ in the House of His Parents* in Chapter 6, ‘The Ugly’, page 181.

but these are the individual cases that demonstrate the variation that is essential for Darwinian evolution to operate. Darwin and artists such as Millais saw the world as consisting of these unique individuals and represented their battle to survive in this harsh world.

In the 1860s, the notion of a precisely observable world became unanchored and forms dissolved into representations of recalled scenes. Rather than look and paint, artists such as Millais and Whistler used memory, twilight and moonlight to reimagine forms through their imagination. The lack of form and detail during twilight allowed them to create associations derived from memory. Reduced light does not idealize form but transmutes it and raises questions about what it represents—an issue that was debated in court during the Whistler *v*. Ruskin trial of 1878. Whistler's ambiguous forms were disconcerting as he used a lack of light to introduce an ambiguity that enabled the viewer to imagine possibilities implicit in the form. He spoke about the transformation of forms that was possible in such crepuscular conditions when 'tall chimneys become campanile'.[16] It is as if London itself became a menagerie of natural forms transmuting before his eyes.

Ruskin objected to Whistler's formless scenes as he insisted that artists should be 'true to nature', although he also thought the artist should reveal hidden truths by going beyond mere representation.[17] He also criticised Darwin but more circuitously. He often misrepresented his theories, for example, after claiming his own ideas were 'in nowise antagonistic' to Darwin's he justified this by writing 'the crocodile and the lamb may have descended from the same ancestral atom of protoplasm'.[18] He then went on to posit, the 'existence of a power' which created the crocodile and the lamb as exemplars of 'moral evil and good' and he described these species as representing myths of 'destruction and redemption, and, in the most literal sense, "words" of God.' The idea that each living thing is an exemplar of an ideal form was developed by Johann Wolfgang von Goethe's (1749-1832) with respect to the underlying form of the plant and then developed by Richard Owen as an explanation of the similarity of the bone structure of a wide range of animals. Darwin thought the particular form of an individual provides evidence for how it evolved but Ruskin and Owen saw its variations as deviations from a fixed archetype. Darwin discussed his very different conception of the archetype in a letter to Huxley. He wrote:

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16 Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus). The full quotation is on page 387, Appendix 3.

17 'Truth to nature' is a phrase often associated with Ruskin but rarely used by him. It occurs in Ruskin, *The Works of John Ruskin* (1903-12), III, p. 617, 'Modern Painters 1', in the context 'we shall be able to show that not only in *truth to nature*, but in all other points, Turner is the greatest landscape painter who has ever lived'. (my italics). The presence of God in nature is indicated in much of his writing, for example, 'the truth of nature is part of the truth of God', *ibid*., p. 141.

18 *ibid*., XIX, pp. 358-59, 'The Queen of the Air'.

> The discovery of the type or 'idea' (in *your* sense, for I detest the word as used by Owen, Agassiz & Co) of each great class, I cannot doubt is one of the very highest ends of natural history […] I shd. have thought that the archetype in imagination was always in some degree embryonic, & therefore capable & *generally undergoing* further development.[19]

Darwin clearly regarded the archetype as a mental construct and a provisional form, which could be seen as a typical example of a type of plant or animal, but one that is constantly changing.[20]

Autumn Leaves

Millais's *Autumn Leaves* (1856, Figure 1) was selected to illustrate a change in the way the natural world was seen and represented. We shall find later that Darwin referred to both these ways of seeing when, in his *Journal*, he switched from a description of the minute details of nature, which recalls the style of an early Pre-Raphaelite painting, to the indistinct, nostalgic impression left in his memory that suggests *Autumn Leaves*. The painting also reminds us of the importance of death and renewal to Darwin's theory.

Autumn Leaves was described by Ruskin as the best representation of twilight he had seen, but the painting is more than a technical exercise. It was painted when Millais lived in Perth, where he moved following his marriage to Effie Gray in order to escape the bitterness and gossip surrounding the annulment of her marriage to Ruskin. Millais's years in Perth were a distinct phase of his life and saw a development in his style. Perhaps to distance himself from the aesthetics of tight observation so closely associated with Ruskin, he experimented with paintings in which specific detail and narrative are suppressed in the interests of a general mood. This painting is generally seen to convey the bittersweet mood of a long-lost childhood when everything seems possible, but death in the form of a faint figure with a scythe is glimpsed in the fading twilight among the dead leaves. The painting had some poor reviews; for example, the *Art Journal* commented that it contained 'a significant vulgarism,' because 'the principal figure looks out of the picture at the spectator', but it was generally well received and is said to have influenced Whistler.[21]

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19 Letter from Charles Darwin to Thomas Henry Huxley, 'The Discovery of the Type or "Idea"', 23 April 1853, Down, emphasis in the original. Huxley and Darwin used the term archetype to describe the most generalised form of a class but Owen and Louis Agassiz believed in a Platonic archetype.

20 Superficially, a typical example of a species looks similar to the holotype, the single physical example of an organism typically stored in a museum. However, scientists do not select exemplars for the holotype; it can be any specimen and is not necessarily even typical. The selection of the holotype is, in this way, Darwinian.

21 'The Royal Academy', *Art Journal,* 18 (1 June, 1856), 161-74 (p. 171) and Barlow, *The Art of John Everett Millais* (2005), pp. 71-74.

The painting is set in the evening and shows four children standing around a pile of smouldering leaves. The sun is below the horizon and is reflected from the clouds, and mist rises from the woods in the background. In the middle ground, there is an indistinct figure holding what looks like a scythe. The other figures are standing on a lawn from which the leaves may have been gathered. A simple feeling of nostalgia is disrupted by the unfamiliar and particular arrangement of the figures, particularly those on the right who are distracted. The overall feeling is one of melancholy but this is contradicted by the inclusion of four girls whom Millais knew, suggesting it could be a group portrait. The two girls on the left were modelled on Millais's sisters-in-law Alice and Sophie Gray and the two on the right were local working-class children called Matilda Proudfoot and Isabella Nicol.[22] The sisters-in-law on their own might suggest the painting was a portrait but the local girls refuse to be involved and they provide a counterpoint that rejects classification. The two central girls stare out at us, as if their work had suddenly been interrupted so that they could interact with us but the girls on the right are tied up in a world of their own. The youngest girl is not involved in the tidying of the leaves and is singled out by the brilliant red of her scarf while she stares distractedly holding a half-eaten apple. The central figure actively offers a handful of dead leaves, dutifully gathered by her companion, to the altar of nature while her acolytes look on distractedly.

Millais described the painting as recreated from his memory of similar evenings and intended to invoke 'the deepest religious reflection' and the religious aspects are considered by Malcolm Warner.[23] Warner points out the fallen leaves remind us of death and the mood of the painting is one of nostalgia but the precise narrative details take us away from Millais's intention, which he said was to paint 'a picture full of beauty and without subject'.[24] Millais's scene of the setting sun, a figure with a scythe and the beautiful young girls burning leaves suggests death and renewal; the old must be disposed of and replaced by the new. This is the fundamental theme of Darwin's theory of natural selection, which depends on the death of the least well fitted. It recognizes that the world continually renews itself and, as Darwin explained, death is not only a natural

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22 Recent research of Effie's family papers shows that 'Sophy' was the spelling used by her father, see Suzanne Fagenece Cooper, *Effie: The Passionate Lives of Effie Gray, John Ruskin and John Everett Millais* (London: Gerald Duckworth, 2012) but I use the conventional spelling of her name. Millais also used Matilda and Isabella in *The Blind Girl* (1856), see Birmingham Museums and Art Gallery, <http://www.preraphaelites.org/the-collection/1892p3/the-blind-girl/> [accessed 22 August 2012].

23 Millais wrote to F. G. Stephens that the effects 'are so transient and occur so rarely, that the rendering becomes a matter of feeling and recollection' and he added it was intended 'to awaken by its solemnity the deepest religious reflection.' He had even intended to add an extract from the Psalms, see Malcolm Warner, *The Victorians: British Painting 1837-1901* (Washington, DC: National Gallery of Art, 1996), p. 73 and Malcolm Warner, 'John Everett Millais's "Autumn Leaves": "A Picture Full of Beauty and without Subject"', in *Pre-Raphaelite Papers*, ed. by Leslie Parris (London: Allen Lane, 1984), pp. 126-42.

24 Warner, 'John Everett Millais's "Autumn Leaves"', pp. 126-42 (p. 137).

part of the world but also part of the process that leads to plants and animals that are better fitted to their environment.

The complex interaction of the figures suggests more than a simple *vanitas* theme and the two beautiful young girls in the centre could have been interrupted as they clear away the old in order to be part of a ritual of temptation and selection. Sexual selection is a process that uses choice and mating to create beauty through generations of selection. The girls on the right are young and innocent and the youngest has given in to temptation but rather than sexual temptation, it is the sensuous taste of the apple. The symbolism normally associated with the apple of temptation has been subverted by the age of the girl. This negation of a symbol suggests it was introduced to repress symbolism but it has the effect of drawing attention to the sexuality of the oldest girl. The central girls will soon be at the age when they are able to invoke the fire of passion rather than the smouldering heap in front of them and the destruction of the leaves could be the destruction of all that has gone before, the old innocent world of childhood. The knowing look of the central girl, who is the one most actively engaged in destruction, suggests that she is the symbolic focus of the painting. The combination of bodily and facial beauty, death and renewal is a powerful summary of the process of sexual selection.

The other two aspects of the painting that bear on Darwin's work are the particular way in which it engages with beauty by combining the natural beauty of the scene with the beauty of the girls and how this invokes and is represented through memory. In his *Beagle* diary between the first and fourth of August 1836, when in San Salvador, Brazil, Darwin described the artistic problem of representing nature, in particular the elements of the scenery that make up its 'exquisite natural beauty'.[25] He described the scenery of green valleys and bright red soil but said: 'to paint the effect is a hopeless endeavour.' He added that learned naturalists described such scenes 'by naming a multitude of objects' but he pointed out the inadequacy of this approach, as unless someone has seen the jungle already it is impossible to appreciate how the plants crowd 'into an entangled jungle.' He wrote that views of the tropical jungle are best seen under the bright light of the noonday sun. However, 'in the temperate zones', like the Scotland represented by Millais, 'the rays of the declining sun, tinged of a red, purple, or yellow colour, add most to the beauties of the scenery'. Darwin lamented that the impression the Brazilian jungle left on his mind would fade, yet leave 'like a tale heard in childhood, a picture full of indistinct, but most beautiful figures'. In his final walk in Brazil he tried to fix the scene before his eyes by stopping 'again and again to gaze on these beauties', yet he knew it was a hopeless task. These few pages of Darwin's diary give us an insight into his view of the interrelationship between memory and beauty. Walter Pater

[25] The quotations in this paragraph are from Darwin, *Journal and Remarks* (1839), pp. 589-91.

also saw the world as subjective and in a state of flux created by the observer from a series of 'gem-like' sensations.[26] Pater saw that this ever-changing world was constructed from memories and observation when he wrote: 'a certain sort of landscape—a country of the pure reason or half-imaginative memory.'[27]

Scientific materialism implies certainty and clarity, which at this period were associated with religious belief, but Darwin undermined both the certainty of materialism and religious belief, leaving the scientist and the artist with only the fallible mechanism of human memory, which fails to provide certainty but which leaves behind beauty. Millais, like Darwin, was representing the beauty of half-remembered memories as the perfect scene faded away. The view of nature as a place of certainty and fixed forms gave way to a world constructed from the viewer's subjective experiences.[28]

Nocturne: Blue and Gold—Old Battersea Bridge

Whistler's *Nocturne: Blue and Gold—Old Battersea Bridge*, (*c*. 1872-6, Figure 2) was selected as another example that shows how memory can be used to represent nature subjectively. Gombrich argues that all paintings are based on some schema in the mind of the artist that is used to realise the intended scene in paint.[29] Darwin's *Journal* suggests two different schemata. The first is based on his detailed and minute scientific observation and the second is the fading memory just discussed. Gombrich argues that the artist uses his or her memory of paintings to translate what is seen into a painting.[30] We know from eyewitness accounts that Whistler would systematically process scenes through his memory and he would then recreate 'a picture full of indistinct, but most beautiful figures.'[31] Darwin's observation indicates there are two possibilities; the first is that the observer processes a visual scene directly through his or her memory to encode the image in paint or text. The second is that the observer remembers the encoded scene, which can then be recalled to mind and could be represented on canvas or described in text. That is, the observer remembers not what was seen but what has been processed by some schema. The alternative, which is the first method of observation described by Darwin, is that the observer remembers facts about the scene, such as the temperature, or details of the specimen being examined, but this is not an option for the artist except to make notes of the colour or organization of particular forms.

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26 Pater, *The Renaissance* (1986, first published 1873), p. 152.
27 *ibid*., p. 87. He wrote about a 'poetry also of memory' (p. 85).
28 This can be seen as a change in the visual representations used to code and decode the scheme, the schemata, or a change in the types of metaphor used to describe the scene.
29 Gombrich, *Art and Illusion*, 6th edn (2002, first published 1960), p. 248.
30 'only a picture painted can account for a picture seen in nature', *ibid*., p. 265.
31 Linda Merrill and James McNeill Whistler, *After Whistler: The Artist and His Influence on American Painting* (New Haven, CT and London: Yale University Press, 2003), p. 70.

Nocturne: Blue and Gold—Old Battersea Bridge was one of the paintings displayed at the opening of the Grosvenor Gallery in 1877, which led to Ruskin's famous criticism in *Fors Clavigera*.[32] When Whistler moved from the bright sunshine and 'open air freshness' of paintings like *Alone with the Tide* of 1861 (Figure 25) to the world of indistinct form in *Nocturne in Blue and Silver* (Figure 26) he adopted the technique of memorising the scene, typically at twilight, before painting it.[33] He sought beauty in the unstable, flickering impressions of the world by stabilising them through his artistic memory of paintings.[34] He chose a time of day when forms and structures could not be clearly seen but were half seen, half-remembered. Whistler's procedure was also verbal as it involved memorising the scene, then turning away and describing it. If he made a mistake, he would again try to memorize the scene until he was perfect. The next day he would paint from memory although he often rejected the result and started again. The forms are still recognizable, for example, in the background of this painting we can see the clock tower and chimneys of the Morgan Crucible Company. However, he was not trying to reproduce a photographic likeness but, in his words, to solve a problem involving an arrangement of line, form and colour.[35] Prettejohn explores the possible precursors to the Nocturnes, which are hard to place within the history of art.[36] They are amongst the most original of breaks with the past and it is interesting that in a letter to George Lucas he refers to his 'theory in art' and 'science of colour'.[37] Another artist who was working through what could be called a scientific approach to art was his friend, Albert Moore and it is possible that both were inspired by the general frisson of excitement surrounding the possibilities of science.[38]

A remembered world is unstable as it depends on the foibles of memory. This instability was recognized by Pater who wrote that in an evolutionary world men are obliged to live by 'impressions, unstable, flickering, inconsistent, which burn and are extinguished with our consciousness of them.'[39] Pater was an undergraduate at Oxford when Darwin's *Origin of Species* appeared and he read it the same year. It caused controversy and discussion among his fellow students and he referred positively to the influence of Darwinism thirty years later at the beginning of *Plato and Platonism*. He

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32 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XXIX, p. 160, 'Fors Clavigera', Letter 79, 18 June 1877. The details of the criticism and the subsequent trial are discussed in Merrill, *A Pot of Paint* (1992).

33 Dorment and MacDonald, *James McNeill Whistler* (1994), pp. 120-21.

34 'All paintings, as Wölfflin said, owe more to other paintings than they owe to direct observation.' Gombrich, *Art and Illusion*, 6th edn (2002, first published 1960), p. 268.

35 'A nocturne is an arrangement of line, form and colour first ', quoted in Dorment and MacDonald, *James McNeill Whistler* (1994), p. 122.

36 Prettejohn, *Art for Art's Sake* (2007), pp. 172-84.

37 *ibid*., p. 181.

38 Another indication of the perceived link between science and art was Hay, *The Science of Beauty* (1856).

39 Pater, *The Renaissance* (1986, first published 1873), p. 151.

wrote: 'Darwin and Darwinism, for which "type" itself properly is not but is only always becoming.'[40] That is, Darwin's theory undermined the idea of fixed types and introduced the notion that the apparently fixed, stable world of nature is changing, mutating and flowing—'always becoming'. This idea of change can be associated with 'fashion' and it is central to Darwin's ideas concerning sexual selection. Pater described the relative spirit as 'not the truth of eternal outlines ascertained once for all, but a world of fine graduations and subtly linked conditions, shifting intricately as we ourselves change'[41] This could be a description of Whistler's Nocturnes with their 'fine graduations' and 'subtly linked conditions' that depend on the instability of Whistler's remembered scene.

The old wooden bridge at Battersea could well have been a site of beauty and emotion for Whistler and this would have modified his memory of the bridge he observed. It crossed from Battersea to Cheyne Walk and was an old and dangerous structure that was described at the time as 'unworthy of its position'.[42] To the west, it overlooked Cremorne Gardens, a popular pleasure garden described as having 'all the delights of Vauxhall, without the costliness' and famous for its frequent firework displays.[43] *Old Battersea Bridge* balances the sparkling lights from a falling rocket with the pinpricks of light from boats and buildings. The bridge was notorious for sinking barges, as the wooden piles were not aligned with the current.[44] From 1866 to 1878 Whistler lived at 96 Cheyne Walk, overlooking Battersea Bridge, so he must have known both the continual fireworks from Cremorne gardens and the dangers of the bridge to barges. In this painting, he combines the two, showing a barge negotiating the bridge at twilight, a dangerous time of day, as it swerves around the enormous wooden supports, and is looked down on by spectators on the bridge, torn perhaps between appreciating the fireworks and making sure the barge went safely on its way. The bridge was well known as a danger to children as the old wooden balustrades had enormous gaps between the railings. These were replaced by iron railings in 1821, but they were only four feet high, and Whistler shows the spectators leaning precariously over the edge.[45]

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40 Walter Pater, *Plato and Platonism* (Teddington: The Echo Library, 1893), p. 10. Perhaps reflecting Schiller's words quoted by Carlyle: 'Truth […] *immer wird, nie ist*; never *is*, always *is a-being*.', Thomas Carlyle, *Critical and Miscellaneous Essays: Collected and Republished*, 6 vols (London: Chapman and Hall, 1839), III, p. 370.

41 Walter Pater, *Appreciations, with an Essay on Style* (London: Macmillan, 1889), p. 41.

42 *The Illustrated Hand-Book to London and Its Environs* (London: Ingram, Cooke,and Co., 1853), p. 115.

43 *ibid*., p. 114.

44 See the photograph taken in 1878, Figure 30. 'it does not stand in a right angle with the stream, so that its piers are continually receiving injury from the vessels and barges striking against them.' William Bernard Cooke and Samuel Owen, *The Thames; or, Graphic Illustrations of Seats, Villas, Public Buildings, and Picturesque Scenery on the Banks of That Noble River* (London: Vernor, Hood, and Sharpe, 1811), II, p. 17, 'Battersea'.

45 George Bryan, *Chelsea, in the Olden & Present Times* (Chelsea, London: George Bryan, 1869), pp. 39-40.

Whistler's first paintings to explore these new ways of representing form were *Nocturne in Blue and Gold, Valparaiso Bay* (1866, Figure 27) and *Crepuscule in Flesh Color and Green: Valparaiso* (1866, Figure 28) and these can be seen as precursors to his Nocturnes of the 1870s. He painted them during his trip to Chile, which he visited to help fight the Spanish, although he wisely managed to avoid any actual fighting. Arthur Eddy, in 1903, wrote that he painted *Crepuscule in Flesh Color and Green* 'at a single sitting' and implied that he painted in front of the scene 'to catch certain effects of light and color.'[46] This suggests that Whistler used the evening light to draw attention to the forms but it also tells us that he had not started to use his technique of memorising the scene. On his return from Chile Whistler worked closely with Albert Moore and produced what is called his 'Six Projects' consisting of sketches of classical figures, but he abandoned this approach to start his Nocturne series.[47]

Darwin's *Journal* drew attention to the limitations of observation and the effects of memory. These aspects lay at the heart of the Nocturnes, in the choice of fading light and Whistler's use of memory to reinterpret the scene. His technique of committing a scene to memory and then describing it with his back turned shows both his commitment to accuracy and his willingness to introduced change as the image evolved and was reinterpreted through his imagination. In *Nocturne in Black and Gold: The Falling Rocket* of 1875 (Figure 29), night is used to reduce form to its minimum and to enable him to construct a representation of a remembered scene of contingent forms rather than an abstraction based on idealization. *Nocturne in Blue and Silver* (Figure 26) illustrates Whistler's contention that:

> Nature contains the elements, in color and form, of all pictures – as the keyboard contains the notes of all music – but the artist is born to pick, and choose, and group with science, these elements, that the result may be beautiful.[48]

Whistler is suggesting a 'DNA' of art, that the artist does not copy nature but combines particular key elements to create a new entity in a way that is analogous to the way that nature recombines the nucleobases of DNA to create a new individual.[49]

In 1877, Whistler displayed seven paintings at the opening of the Grosvenor Gallery, including the *Falling Rocket*, and received some favourable reviews. *The Academy* was generally full of praise and wrote about 'the loveliest of the painter's works' and 'a curious power of intuition and suggestion working through means equally simply

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46 Arthur Jerome Eddy, *Recollections and Impressions of James A. McNeill Whistler*, 2nd edn (Philadelphia: J. B. Lippincott, 1903), p. 23.

47 The word 'Nocturne' was suggested to him by his patron, Frederick Leyland, in 1872 and he retrospectively renamed some of his earlier paintings by moonlight.

48 Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus), para. 40.

49 'DNA', see Glossary.

and subtle'.[50] However, not all critics were complimentary; Oscar Wilde wrote: 'These pictures are certainly worth looking at for about as long as one looks at a real rocket, that is, for somewhat less than a quarter of a minute.'[51] Although intended as a witty comment it does draw attention to the paintings as a snapshot in time. Their low tonal range suggests timelessness but the rocket trails make clear that Whistler was recording the impression of a single moment processed through his memory into an eternal moment. As we have seen, Ruskin was even more critical than Wilde was and wrote to the effect that Whistler was ill-educated, full of conceit and an impostor. His review in *Fors Clavigera* included the famous comment that he 'never expected to hear a coxcomb ask two hundred guineas for flinging a pot of paint in the public's face.'[52] Whistler sued Ruskin and the trial took place the following year, but Ruskin claimed to be too ill to attend and was represented by William Powell Frith (1819-1909), Tom Taylor (1817-1880, dramatist, critic and editor of *Punch*) and Burne-Jones as witnesses for the defence. Whistler won the case but it was a Pyrrhic victory as damages were set at one farthing.

Although, we do not have a transcript of the Whistler *v*. Ruskin trial sufficient reports were published to enable it to be reconstructed. When asked 'Are those figures on the top of the bridge intended for people?' Whistler replied 'They are just what you like.'[53] When the judge asked if it was a barge beneath the bridge, Whistler replied 'Yes, I am very much flattered at your seeing that. The picture is simply a representation of moonlight. My whole scheme was only to bring about a certain harmony of colour.'[54] Whistler stressed the colour rather than a harmony of form and the form is suppressed by the overall similarity in tone and hue; with the exception of the gold dots the painting is a wash of blue, in places a thin wash that allows the canvas to show. Whistler mixed large quantities of the predominant tone that he called his 'sauce', and although he started on an easel, he often had to throw the canvas on the floor to stop the sauce running off.[55] The sky and water were rendered by 'great sweeps of the brush of exactly the right tone.'[56] We know he resisted categorization and narrative interpretation and, for example, it appears he refused to accept a title associating one painting with a character from Dickens.[57] Narrative detracts from seeing a painting as a beautiful object, as it allows the viewer to mentally construct a story rather than just appreciate the forms and colours.

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50 William Michael Rossetti, 'The Grosvenor Gallery', *The Academy,* 11:264 (26 May, 1877), 467-68 (p. 467).

51 Oscar Wilde, 'The Grosvenor Gallery', *Dublin University Magazine,* 90:535 (July, 1877), 118-26 (p. 120).

52 Ruskin, *The Works of John Ruskin* (1903-12), XXIX, p. 160, 'Fors Clavigera, Letter 79, 18 June 1877.

53 Merrill, *A Pot of Paint* (1992), p. 151.

54 *ibid*.

55 Dorment and MacDonald, *James McNeill Whistler* (1994), p. 121.

56 *ibid*., p. 115.

57 *ibid*., p. 116, tells how it was suggested that *Harmony in Grey and Gold* be retitled 'Trotty Veck', a Dickens character, to make it more valuable.

Whistler's comments in court suggest he wanted the picture seen as an abstract collection of colours and shapes, seen, by one person as a barge, and by another as a blue shape, as long as both saw the harmony and beauty of the shapes and the colours.

At the trial, Burne-Jones described *Nocturne in Blue and Silver—Chelsea* (Figure 31) as 'a beautiful sketch; but that is not alone sufficient to make it a good work of art. It is deficient in form, and form is as essential as color.'[58] Later he pointed out, regarding *Nocturne: Blue and Gold—Old Battersea Bridge*, (Figure 2) that: 'It is really very beautiful in color, but more formless than the other. It is bewildering in its form.'[59] We do not know to what extent Burne-Jones represented Ruskin's views but it is clear from Ruskin's writings that the lack of form would have been a major issue. Although in *Modern Painters* Ruskin wrote that there is 'a truth of impression as well as of form', he was objecting to mere slavish imitation.[60] For Ruskin the accurate representation of the natural world was a moral necessity, and he clearly distinguished between Turner's work and Whistler's superficially similar work. In addition, for Ruskin, the impression was the direct experience of God's creation, but for Whistler an impression was a view of the world to be remembered and replayed. Burne-Jones's comments suggest that he did not appreciate the beauty of abstract forms but expected to be able to decode form into precise objects even though some of his paintings show that he did not expect the viewer to be able to construct a narrative.

In summary, both Darwin and Whistler forced their audiences to question previously held assumptions about form and nature. They both thought that remembered forms could become more beautiful and that beautiful forms were assembled from elements or variations in nature, in Darwin's case by means of a natural process and in Whistler's case by assembling the elements. Both looked at the world as a problem to be solved and both arrived at solutions that involved observation and the selection of contingent forms through a process that took place over time. The metaphor of absolute nature was replaced by the metaphor of nature as a piano whose keys could be selected to create a beautiful picture.[61]

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58 Merrill, *A Pot of Paint* (1992), p. 172.

59 *ibid*., p. 173.

60 Ruskin, *The Works of John Ruskin* (1903-12), III, p. 104, 'Modern Painters 1', Chapter 5: 'Of Ideas of Truth'.

61 'Nature contains the elements of color and form of all pictures – as the keyboard contains the notes of all music – but the artist is born to pick, and choose, and group with science, these elements, that the result may be beautiful', Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus).

Animal Fears and Fashions

In the second half of the nineteenth century, beauty was an important issue. Fydor Dostoevsky (1821-1881) wrote in his notebook: 'Beauty will save the world—two kinds of beauty'.[62] However, he does not say what they were. A hint is provided in his final novel of 1880, *The Brothers Karamazov.* One of the brothers, Dmitry, reads a poem that includes the line 'And lust in lowly insect fires' and he adds 'I am that insect' and continues: 'Beauty! It makes me mad to think that a man of great heart and high intelligence should begin with the ideal of Madonna and end with the ideal of Sodom.'[63] This could be a metaphor for the journey from Ruskin's view of the God-given beauty of nature through Darwin's theories of beauty and animal sexuality to the accusation of sodomy brought against the aesthete and devotee of beauty Oscar Wilde. His trial in 1895 and subsequent incarceration has traditionally marked the terminal point of the Aesthetic Movement. Beauty continued to be interpreted in various ways in the final decades of the nineteenth century and the peacock became a reference point for discussions on creation, evolution, and the aesthete's taste for decadent refinement, but the 'ideal of Madonna' had been lost.

However, even in the 1860s the lust of the animal kingdom fired the public's imagination. As has already been mentioned, in 1861, Du Chaillu returned from Africa with accounts of ferocious gorillas and horrific stories of their sexual appetites and savage practices, and the public's interest in gorillas was parodied in the *Punch Annual* where Mr Punch interviews the 'Gorilla Ambassador' from Africa (Figure 32).[64] Du Chaillu explained that the 'negroes' believed gorillas were possessed by a spirit of the departed and had the 'intelligence of man' but the 'strength and ferocity of the beast'. On one occasion, he was told that gorillas were found tying up sugarcane into regular bundles before taking it away. The natives attacked them but they were routed and the gorillas took prisoners only to return them a few days later uninjured except that the 'nails of their fingers and toes had been torn off'.

From 1859 onwards, the gorilla and the ape were frequently used in cartoons associated with Darwin's theory, and although he wrote nothing about human origins until

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62 Kenneth Lantz, *The Dostoevsky Encyclopedia* (Westport, CT and London: Greenwood Press, 2004), p. 7.

63 Fyodor Dostoevsky, *The Brothers Karamazov*, trans. by David Magarshack (Harmondsworth: Penguin Books, 1958), p. 123.

64 All the quotations in this paragraph are from Paul Belloni Du Chaillu, *Explorations & Adventures in Equatorial Africa* (London: John Murray, 1861), p. 61. The publisher insisted that the original 'the gorilla had forced her to submit to his desire' was toned down to 'the gorilla had misused her', see Dawson, *Darwin, Literature and Victorian Respectability* (2007), p. 63. The association between apes and sexuality goes back to the Middle Ages, see Horst Woldemar Janson, *Ape and Ape Lore in the Middle Ages and Renaissance* (London: Warburg Institute, 1952), pp. 261-86, Chapter 9, 'The Sexuality of Apes'.

1871, the popular debate about his theory took place during the 1860s and centred on our ape-like ancestors.[65] The gorilla was regarded as closer to 'savages' and its image was used to reinforce a wide range of racial prejudice, for example, *Harper's Weekly* showed the Irish as gorillas.[66] In 1860 and the spring of 1861, following the publication of *Origin,* the gorilla often had friendly or humorous connotations and by the 1870s, it had become a harmless symbol of fun with amusing sexual overtones.[67] However, in the intervening period it had different associations. During his visit to London early in 1861, Du Chaillu emphasized the violence and intelligence of the gorilla, and it became associated with our savage past and a reminder that beneath the veneer of civilization we are beasts. The gorilla was still often associated with humour and the first issue of *Fun* in 1862 showed 'The Gorilla Family at the Sea-Side'.[68] Darwin's work gradually had the effect of intellectualizing the issues and by the 1870s our origins had acquired a level of popular sophistication illustrated by a cartoon showing a fashionable lady explaining her understanding of Darwin to a startled young man.[69] The connection between Darwin and the representation of animals is discussed next with respect to a Whistler painting and a cartoon by Sambourne.

The White Girl

There are only a few monkeys and apes represented in fine art in Britain between 1859 and 1882 but there are a larger number of cartoons and illustrations.[70] This might be because apes and monkeys were regarded as too slight a subject and one associated with sexual licentiousness and humour. However, Whistler did incorporate a wild animal in *The White Girl* (1862, Figure 3). This shows nature, represented as a wolf pelt or bearskin, dominated by a woman. The artificial surroundings and the indecipherable woman add to the artificiality and unnaturalness of the room yet the animal skin

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65 Towards the end of *Origin* Darwin wrote: 'Light will be thrown on the origin of man and his history.' Darwin, *Origin*, 1st edn (1859), p. 488.

66 Thomas Nast, 'St. Patrick's Day, 1867—The day we celebrate.', *Harper's Weekly*, April 6, 1867 (Figure 33).

67 'Monkeyana: Am I a Man and a Brother?' *Punch*, 18 May 1861 (Figure 34), 'The New Photographic Looking Glass', *Punch*, 41, 23 November 1861, p. 204 (Figure 35) shows an Irishman looking at a photograph of a gorilla that two children were told by their mother not to show him, 'The Lion of the Season', *Punch*, May 25 1861 (Figure 36) shows a frightened servant announcing a gorilla as guest, *Punch*, 14 December 1861 (Figure 37) shows 'Mr. G. O'Rilla representing the Young Ireland Party'.

68 'The Gorilla Family at the Sea-Side', *Fun*, 1, 21 September 1861, p. 7, Figure 38.

69 'Exactly So!', *Fun,* 25 January 1873, 44 (Figure 39). Also see <http://sophia.smith.edu/~maldrich/evolution/> [accessed 22 August 2012] for a collection of cartoons about evolution from 1861 to 1925.

70 A few artists did occasionally include monkeys, such as William Mulready and Edwin Landseer, particularly in the first half of the nineteenth century. Monkeys were included more often in the eighteenth century, often as pets, when there was no widespread awareness of their ancestral connection to humans.

introduces an element of raw nature, of the new Darwinian 'survival of the fittest'.[71] However, it is tamed and eviscerated and only its shiny eyes and bared teeth remind us of its former deadly presence in the wild. The painting raised important question about the way nature was represented and how this changed during the 1860s. Its critical reception in London and Paris has been examined by art historians, as has its relationship to the Wilkie Collins novel *The Woman in White*, questioning whether the painting operates as a narrative work.[72] Two aspects that relate to Darwin are the significance of the animal rug and the symbolic significance of the woman as a spirit or apparition.

In the painting, an expressionless woman stands with her arms drooping by her sides. She clutches the lifeless remains of what could be a lily and some other unrecognizable flowers lie strewn on an animal-skin rug. The lily generally symbolized beauty, so a dead lily could symbolize the end or death of beauty, perhaps in a moral sense. When it was exhibited at the *Salon des Refusés* in Paris in 1863, realist critic Jules-Antoine Castagnary questioned the woman's sexual circumstances and claimed that her dilated eyes and quivering nostrils ('*la narine émue'*) suggested that she was a newlywed, had lost her virginity the previous evening and that her husband could be sleeping on the other side of the curtain.[73] Although he thought it ennobled the idea of marriage, other critics commented on the lack of a wedding ring and the possibility of an immoral affair. Castagnary's creative explanation does recognize that she has an unusual blank expression described by others as vague, languid or deep and she has unnaturally bright red lips turned down at the corners, which enables us to start to construct a narrative. However, Whistler's correspondence and actions make it clear that he was trying to avoid any symbolic message or associations that could lead to a narrative interpretation.

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[71] The phrase first occurs in Spencer, *The Principles of Biology* (1864), p. 54 as a synonym for Darwinian natural selection and Darwin first used the term in the fifth edition of *Origin* (1869). Whistler's painting pre-dates both uses but Darwin's 'wedges' metaphor of 1859 conveyed the idea even more powerfully. He wrote: 'The face of Nature may be compared to a yielding surface, with ten thousand sharp wedges packed close together and driven inwards by incessant blows', Darwin, *Origin*, 1st edn (1859), p. 67.

[72] This section draws upon Dorment and MacDonald, *James McNeill Whistler* (1994), Robin Spencer, 'Whistler's "The White Girl": Painting, Poetry and Meaning', *Burlington Magazine,* 140:1142 (May, 1998), 300-11, Aileen Tsui, 'The Phantasm of Aesthetic Autonomy in Whistlers Work: Titling "*The White Girl*"', *Art History,* 29:3 (June, 2006), 444-75, Nicholas Daly, 'The Woman in White: Whistler, Hiffernan, Courbet, Du Maurier', *Modernism/Modernity,* 12:1 (2005), 1-25 and Rachel Teukolsky, ' White Girls Avant Gardism and Advertising after 1860', *Victorian Studies,* 51:3 (Spring, 2009), 422-37.

[73] '*le lendemain de l'épousée, cette minute troublante où la jeune femme s'interroge et s'étonne de ne plus reconnaître en elle sa virginité de la veille […] se détachant sur les rideaux blancs d'une alcove fermée, derrière lesquels l'autre sommeille encore sans doute […], la narine émue, l'oeil dilaté […] une idée qui purifie la scène et l'ennoblit: idée de marriage*.' Spencer, 'Whistler's "The White Girl": Painting, Poetry and Meaning', *Burlington Magazine,* 140:1142 (May, 1998), 300-11 (p. 309).

She stands three-quarters on with her head turned towards us, although she is not looking directly at us but gazing blankly in our direction. To modern eyes, the white dress provides her with an air of innocence, but at the time, its loose uncorseted shape suggested a moral looseness added to by her free flowing hair and bright red lips. The off-white curtains enclose her in a narrow space, which includes a large area of the floor, which pushes her towards us. The amount of floor area included suggests we are looking both directly at her and downwards at the same time, in modern terms it is as if a wide-angle lens was used. The large area of flooring gives prominence to the rug and the animal's head stares directly towards us, its direct ferocious glare appearing more alive than the blank look of the woman. One critic at the time, Viel-Castel, thought the animal's head 'thrusts menacingly toward the beholder'.[74] The care with which the head is painted also suggests some significance beyond it merely being a floor covering. Rugs of this type were popular and they suggested exotic foreign travel and the span of the British Empire. However, the animal's gaping mouth, sharp teeth and ferocious expression combined with its dead, skinned body suggest a wildness that has been tamed by the woman or a wildness in the woman that has been tamed. This combined with the dead and fallen flowers, her dishevelled hair and the discoloured edges to her dress suggest the end of innocence.

The rug is an animal alternately described by art historians as a bear and a wolf. Examining a black and white comparison of the animal against a photograph of a wolf and a bear (Figure 40) shows that it contains elements of both and may have been intended to represent a generic wild animal. The type of animal may have been intentionally suppressed in order to avoid associations that generate narrative of the type Whistler was trying to avoid. However, if we take the animal as a bear there is an interesting link to a controversy that was taking place at the time. This was generated by a section in the first edition of *Origin* concerning a bear with an open mouth. This does not mean that Whistler was aware of the particular issue but the issue is itself indicative of cultural assumptions concerning the fixed nature and hierarchy of species. Darwin wrote:

> I can see no difficulty in a race of bears being rendered, by natural selection, more and more aquatic in their structure and habits, with larger and larger mouths, till a creature was produced as monstrous as a whale.[75]

The controversy surrounding this image caused Darwin to delete the sentence from subsequent editions.[76] Darwin painted a picture of a bear 'swimming for hours with widely

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[74] Viel-Castel, 'Salon de 1863', 'une peau de loup, dont la tête empaillée et pourvue d'yeux d'émail, se dresse menaçante vers le spectateur' quoted in Michael Fried, *Manet's Modernism: Or, The Face of Painting in the 1860s* (London: University of Chicago Press, 1998), p. 223.

[75] Darwin, *Origin*, 1st edn (1859), p. 184.

open mouth, thus catching, like a whale, insects in the water.'[77] This comical image of transformation, which was picked up by cartoonists, suggested the open-mouthed bear could change before our eyes into a monstrous whale whose mouth grew in size as it was watched. Owen, in an anonymous and critical review, associated the idea with one put forward by Buffon, who referred to the agency of an 'organising force' that could 'lower the species' by way of degeneration and gave the example of a bear degenerating into a whale.[78] Unlike other eighteenth-century naturalists, such as Lamarck, Buffon suggested that transmutation could take place in a downward direction and a bear might become a seal, and a seal a whale; or a human being might become an ape.[79] Prior to Darwin's theory, many scientists believed that species were fixed and could be organized in a hierarchy corresponding to their evolutionary development or to their fixed place in a divinely created ladder of creation. Linnaeus described such as ladder in *Systema Naturae* (first edition 1735) when he classified all the animals.

The painting is now known as *Symphony in White, No. 1* but it was never exhibited in Whistler's lifetime under this name. It acquired it by implication in 1867 when Whistler named another painting *Symphony in White, No. 3* (1865-67, Figure 41). The numbering and the consistent use of Johanna Hiffernan as a model in a white dress for all three paintings suggest an intention to create a narrative sequence. In which case, a possible approach is to read them as a triptych, as we do with Augustus Egg's *Past and Present* (1859, Figure 42, Figure 43 and Figure 44). One interpretation of such a triptych is that in the first, she has just lost her virginity but has no ring, suggesting she is unmarried. She has selected and conquered the beast, a symbolic interpretation of her lover or of sexual desire, and in the second, *Symphony in White, No. 2: The Little White Girl* (1864, Figure 45) she is married to him and is surrounded by fashionable vases and fresh flowers but has a melancholy expression. In the third, *Symphony in White, No. 3* she sits with a friend and looks happier, or at least resigned to married life. One moral

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[76] Many negative comments were made, for example, John Morris, 'On the Origin of Species, by Means of Natural Selection; or the Preservation of Favoured Races in the Struggle for Life', *Dublin Review,* 48:95 (May, 1860), 50-81 accused Darwin of accepting a fact because it suited his theory. In subsequent editions, Darwin kept the reference to a bear catching insects 'almost like a whale' (p. 184) but he dropped the description of how it could be transformed into a whale by means of natural selection. The evolution of the whale is discussed in Steve Jones, *Almost Like a Whale: The Origin of Species Updated* (London: Doubleday, 1999), p. 17.

[77] Darwin, *Origin*, 1st edn (1859), p. 184.

[78] [Owen], 'On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life, by Charles Darwin', *Edinburgh Review,* 111:226 (April, 1860), 487-532 (pp. 508-17).

[79] 'The Origin of Species Controversy', *Register of Facts and Occurrences Relating to Literature, the Sciences, and the Arts* (October, 1860), 17-20 (p. 19). The first issue of the magazine was in August and had an article on Holman Hunt. We know that Whistler took note of a review of Hunt in 1873 but we do not know if he took an interest as early as 1860, see Robin Spencer, 'Whistler's First One-Man Exhibition Reconstructed', in *The Documented Image: Visions in Art History*, ed. by Gabriel P. Weisberg and Laurinda S. Dixon (Syracuse: Syracuse University Press, 1987), pp. 17-49 (p. 28). Whistler was also a good friend of Millais, who was in turn a good friend of Hunt, so it is possible he read the review in *The Register*.

could be a warning that although women can select and conquer men this does not always lead to happiness. The representation of powerful women in art and the association with Darwin's theory of sexual selection is discussed in the section 'Female Sexual Selection' in the next chapter.

When it was exhibited at the *Salon des Refusés* in Paris in 1863 Fernand Desnoyers wrote that the painting depicted a medium and claimed that the artist was 'the most spiritualist of painters'.[80] Gustave Courbet (1819-1877) was reported to have called it '*une apparition, du spiritisme*' although from a realist painter this may have been intended as a slight. Others described her as a '*fantôme*' ('ghost').[81]. These references suggest an association with the then popular belief in Spiritualism. We know that Whistler and his model, Joanne Heffernan, were interested in the new religion and it 'swept Rossetti's circle in the 1860s'.[82] The specific form of Spiritualism that swept Europe started in upstate New York with an incident concerning a group that has become known as the Fox sisters.[83] Spiritualism was closely associated with pseudo-sciences such as 'animal magnetism', mesmerism, phrenology, somnambulism and magnetic healing. It is a form of 'scientific' religion as its believers thought they were basing their beliefs on close observation and experimental evidence. There were even scientists, such as Wallace, who were tricked by charlatans into believing that Spiritualism was based on solid evidence. Wallace thought he was observing phenomena as real as any natural observation at the séances he attended.

As early as 1838, Darwin wrote to his sister about 'the nonsense of all the spiritual-minded people who believe they live in a world of spirits.'[84] In 1854, Darwin wrote to J. D. Hooker decrying another theory of creation and added: 'it is like "magnetism" turning a table', a reference to 'animal magnetism', the term used to describe the state into which many of the mediums fell during spiritualist séances.[85] In 1860, in a letter to Huxley, he referred positively to an article by Hopkins in *Fraser's Magazine* but rejected

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80 Spencer, 'Whistler's "The White Girl": Painting, Poetry and Meaning', *Burlington Magazine,* 140:1142 (May, 1998), 300-11 (p. 308). Spencer also refers to Courbet's comment.

81 Letter from Fantin-Latour to Whistler, 15 May 1863. Also see Patrick Chaleyssin, *James McNeill Whistler* (London: Grange Books, 2005), p. 23.

82 Dorment and MacDonald, *James McNeill Whistler* (1994), p. 78.

83 Rossetti, *Dante Gabriel Rossetti. His Family-Letters with a Memoir* (1895), p. 255, J. Johnson and T. P. B., 'Are the Modern Phenomena, Designated "Spiritual Manifestations," Genuine? And Have We in Them Satisfactory Evidence of Intercourse with the Inhabitants of the Spiritual World?', in *The British Controversialist, and Literary Magazine: Devoted to the Impartial and Deliberate Discussion of Important Questions in Religion, Philosophy, History, Politics, Social Economy, Etc., and to the Promotion of Self-Culture and General Education* (London: Houlston and Wright, 1861), pp. 306-15 (p. 308) and John Tyndall, *Fragments of Science for Unscientific People: A Series of Detached Essays, Lectures, and Reviews* (London: Longmans, Green, and Co., 1871), pp. 427-35.

84 Letter from Charles Darwin to Susan Elizabeth Darwin, 'Nonense of a World of Spirits', 26 April 1838, 36 Great Marlborough Street, London.

85 Letter from Charles Darwin to Joseph Hooker, 'Against Forbe's Theory of Polarity and Parallelism', 7 July 1854, Down.

Hopkins's idea that at some point during man's progressive improvement an immortal soul was acquired.[86] Darwin and Huxley were not interested in Spiritualism, and the only séance Darwin attended was in 1874 when he walked out before anything happened. Darwin referred to the 'capital article' by Tyndall called 'Science and the Spirits' in which he debunked Spiritualism.[87] One of the questions that concerned many was that as man must have an immortal soul exactly when, during our evolution from animals was the soul acquired. Wallace's first paper on the origins of man was given to the Anthropological Society on 1 March 1864, and although he does not mention a non-natural origin for man in this address, he converted to Spiritualism at some time between 1865 and 1869 and in 1869 he claimed that natural selection was not enough to explain man. The woman in *Symphony in White, No. 1* therefore can be seen as referencing a cultural phenomenon of the period associated with the search for new religions following Darwin's publication of *Origin*.

Whistler's revolutionary painting is one of the seminal works of the nineteenth century but at the time it was interpreted in the context of the sensational novel by Wilkie Collins, *The Woman in White* (serialized in 1859-60 and published in 1860), and the craze for spiritualism. It can be seen today as a precursor to the Nocturnes in its rejection of narrative its restricted colour range and its linear strokes, although in this case vertical rather than horizontal. It also resembles the Nocturnes as an invocation of mood but one that is delicate and difficult to define, like 'a picture full of indistinct, but most beautiful figures'.[88]

Designs after Nature

Another approach to taming nature was to use humour. Edward Linley Sambourne (1844-1910) drew a series of cartoons based on nature, with exaggerated styles incorporating distorted plants and animals. These were published in *Punch* between 1867 and 1876 and one was 'Designs after Nature: Grand Back-Hair Sensation for the Coming Season' (*Punch,* 1 April 1871, Figure 4). Fashion can be linked to Darwin's ideas of evolution as both are concerned with change and a continual state of flux. Although, the first few cartoons in Sambourne's 'Designs after Nature' series pre-dated *Descent*, this cartoon could be associated with it as *Descent* had been published on 24 February 1871 and reprinted in March.

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[86] Letter from Charles Darwin to Thomas Henry Huxley, 'Report on Oxford Meeting', 3 July 1860, Sudbrook Park, Richmond and William Hopkins, 'Physical Theories of the Phenomena of Life', *Fraser's Magazine,* 62:367 (July, 1860), 74-90 (p. 88).

[87] Letter from Charles Darwin to Joseph Hooker, 'Refers to Tyndall's Article on Spiritualism', 7 January 1865, Down and John Tyndall, 'Science and the Spirits', *The Reader,* 4:102 (10 December, 1864), 725.

[88] Darwin, *Journal and Remarks* (1839), p. 591

During the ten years following the publication of *Origin*, two animals came to symbolize Darwin's ideas in the popular imagination— the ape and the peacock.[89] The peacock had long been a symbol of beauty, and Darwin's claim that the spectacular tail was used to attract mates was controversial and opposed by many including Ruskin and George Campbell (1823-1900).[90] Both regarded beauty, such as that of the peacock's tail, as proof of divine creation and they thought Darwin's theory offered no acceptable explanation of how it could have come about.

The cartoon shows the back of a woman whose head and hair are covered in a peacock's body and feathers. The body of the peacock forms the woman's hat but the size and completeness of its bodily form suggest that the peacock has taken control of the woman. It is possible that Sambourne was indicating that we are all controlled by our inherited instincts, which in this case results in the woman being dominated by a male bird, but one she has selected to increase her sexual allure. The cartoon was part of a long running series lampooning the grotesque effects that can be achieved by combining nature and fashion.[91] It can be seen as an intellectual pivot point between the biological discussions of the 1860s and the aesthetic arguments that followed. We see the back of a woman parading at the seaside with a peacock parasol and hat, the feathers of which are enmeshed with her long flowing hair. The woman's sexual display is enhanced by her adoption of a male peacock's sexual characteristic, perhaps signifying her recognition that she is being chosen for her beauty, and to clarify that she is the agent of selection her gaze controls a symbol of male potency, the lighthouse. Sambourne satirizes the pretensions of Darwin's supporters, the affectation of ideas about beauty, the aspirations of the women's emancipation movement, and the grotesqueness of a fashion that at this period often involved whole birds nestled on fans and posed on hats. There is also a more subtle point made through the association of Darwin's ideas with fashion.[92] Darwinian sexual selection, like fashion, is based on idiosyncratic preference for certain undirected variations. There is, therefore, no explanation for particular forms of beauty;

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89 This section uses material from Laurence Shafe, 'Why Is the Peacock's Tail So Beautiful?', in *Darwin and Theories of Aesthetics and Cultural History* ed. By Barbara Larson and Sabine Flach (Farnham: Ashgate, 2013).

90 George Campbell, *The Reign of Law* (London: Alexander Strahan, 1867), p. 203. Campbell mentioned the peacock but his main argument concerned what he believed was the impossibility of the 'ball and socket' ornament on the wings of the Argus Pheasant having evolved.

91 Over twenty images parodying fashion based on nature were shown between 1867 and 1876.The cartoons included the spider (30 Nov 1867, Figure 46), the swan (28 March 1868, Figure 47), the butterfly (17 June 1871, Figure 48) and the fuchsia (29 June 1872, Figure 49).

92 The representation of fashion in *Punch* is discussed in Christina Walkley, *The Way to Wear'em: 150 Years of Punch on Fashion* (London: Peter Owen, 1985). She mentions an earlier *Punch* cartoon showing two women on a staircase with flowing dresses like a peacocks train, 'A Remarkable Study from Nature' (1 June 1867, p. 224, Figure 50). There is also a Sambourne cartoon of a woman with a train like a peacock walking through the park in *Punch*, 21 December 1867, p. 256.

they can be completely random, like fashion.[93] Fashion was, like sexual selection, engaged in a process of constant flux that could produce beauty, novelty and capriciousness. The similarity of fashion and evolution has been pointed out elsewhere, but only to the extent that both involve change. The similarity runs much deeper with respect to sexual selection as both are involved with beauty and preference by an informed majority. Sexual selection is a fashion statement that runs over thousands of years.

The trend for using the beautiful feathers of dead birds as fashion accessories seemed to support their association with sex, but Darwin's theory of sexual selection was argued against constantly, a serious opponent being St. George Mivart (1827-1900) who published *On the Genesis of Species* the same year as *Descent*. He wrote in a well-argued rebuttal:

> Mr. Darwin explains the brilliant plumage of the peacock or the humming-bird by the action of sexual selection: the more and more brilliant males being selected by the females (which are thus attracted) to become the fathers of the next generation, to which generation they tend to communicate their own bright nuptial vesture. But there are peculiarities of colour and of form which it is exceedingly difficult to account for by any such action.[94]

One example he quoted was Darwin's five separate reports concerning the sudden appearance of a 'black-shouldered peacock' as evidence against his theory.[95] Natural selection requires small changes taking place over long periods of time, not the sudden birth of an entirely new species.[96] Darwin was one of the first scientists to use rigorously what today is regarded as the scientific method, and this included presenting all the arguments and evidence against his own theory and then dealing with each in turn. In this case, he wrote: 'I have heard of no other such cases in the animal or vegetable kingdom', which implies he thought the observation was probably incorrect and he went on to suggest it was not a new species but a variety, and if it occurred, the 'black-shouldered' form could be a reversion to a previous type.

Sambourne produced a series of illustrations that highlight the relationship between women's fashions and natural forms, and Susan Bernstein demonstrates how these cartoons referenced the interest in Darwinian natural selection and scientific

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93 Strictly speaking, variation is undirected rather than random as crossover involves reusing existing genetic sequences (see Glossary). Single nucleotide mutations are random but occur rarely and most are neutral or deleterious.

94 Mivart, *On the Genesis of Species* (1871), p. 37.

95 Charles Darwin, *The Variation of Animals and Plants under Domestication*, 1st edn, 2 vols (London: John Murray, 1868), I, pp. 290-91.

96 Some early geneticists believed that evolution takes place through sudden jumps or saltations. Saltation was also favoured by creationists, such as George Campbell, as they believed the jump was caused by God. Darwin was always strongly opposed to saltation.

categorization.[97] Sambourne's exploration of fashion and femininity illustrates the absurdity of fashion by his use of exaggeration and unexpected juxtapositions, but it also empowers the female form through its ability to absorb and transmute nature. James Eli Adams points out that Tennyson undermined the metaphor of a maternal caring nature by replacing it with 'Nature, red in tooth and claw'.[98] Although many regarded it as cruel, the fashion for wearing stuffed birds spread throughout the 1870s and 1880s.Sambourne was making a satirical comment on the slaughter of birds such as the peacock and birds of paradise for the sake of fashion. As early as 1867, *Punch* had an article decrying the slaughter of birds simply so that their feathers could be used for 'mantles, muffs and bonnets'.[99] The 1860s and 1870s were decades in which peacocks and other exotic birds were popular both within fine art, such as Leighton's *A Girl Feeding Peacocks* (c. 1863, Figure 51) and John Inchbold's *Suggestive Study, Paradise (Head of a Girl and a Bird of Paradise)* (1864-5, Figure 52) as well as in the decorative arts. Homes were decorated with peacock feathers, peacock wallpaper and soft furnishings such as William Morris's *Peacock and Dragon* design (1878, Figure 53) and Arthur Silver's (1853-1896) *Peacock Feather* fabric for Liberty (*c*. 1887, Figure 54). The peacock was also used as a design theme for interior decoration such as Albert Moore's peacock design for Lehmann's house (1872, Figure 55) and Whistler's later but better known and more controversial Peacock Room (1876-77, Figure 56), an interior he designed for Leyland House.

Peacock and ostrich feathers, sunflowers, and blue china were images associated with the Aesthetic Movement, and the cult of the aesthete became a fashionable 'pose' associated with refined tastes, but the cult also raised questions of sexual identity with its unmanly men and manly women. Moreover, the symbol of the peacock had also always had a darker side.[100] In 1878, Ruskin was suffering bouts of madness and had hallucinations that included the Devil in the form of a peacock:

> I thought I was in a farmyard and that I was impelled by the tyrant Devil to do some fearful wrong, which I strove with all my might and main to resist. But my passionate efforts were to no avail; and every time I did the wrong I heard the voice of the Demon—that is, the peacock—give forth a loud croak of triumph.[101]

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97 Susan David Bernstein, 'Designs after Nature: Evolutionary Fashions, Animals, and Gender', in *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture*, ed. by Deborah Denenholz Morse and Martin A. Danahay (Aldershot: Ashgate, 2007), pp. 65-80 (pp. 69-71).

98 James Eli Adams, 'Woman Red in Tooth and Claw: Nature and the Feminine in Tennyson and Darwin', *Victorian Studies,* 33:1 (Autumn, 1989), 7-27 (p. 7).

99 'Fashionable Avicide', *Punch, or the London Charivari* (14 December, 1867), 239.

100 An early reference to the peacock is *The Aberdeen Bestiary*, folio 59v, 60r, 60v, 61r, *c.* 1200, 'The peacock, as Isidore says, gets its name from the sound of its cry. For when it starts, unexpectedly, to give its cry, it produces sudden fear in its hearers. The peacock is called *pavo*, therefore, from *pavor*, fear, since its cry produces fear in those who hear it.' <http://www.abdn.ac.uk/bestiary/translat/60v.hti> [accessed 22 August 2012].

101 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XXXVIII, p. 172. George Harley, 'Mr. Ruskin's Illness Described by Himself', *British Medical Journal* (27 January, 1900), 225.

In 1882, the year Darwin and Rossetti died, Oscar Wilde engaged in a 'whistle-stop' tour of the US promoting his new aesthetic philosophy. Wilde described the new philosophy as 'our English Renaissance' with 'its passion for physical beauty, its exclusive attention to form, its seeking for new subjects for poetry, new forms of art, new intellectual and imaginative enjoyments'.[102] In Wilde's play *Salome* (1891 French, 1894 English) Herod offers fifty white peacocks to Salome but she refuses and demands the head of Iokanaan (John the Baptist), who describes her as 'Daughter of Sodom', alluding to the other type of beauty suggested by Dostoevsky, where procreation is no longer a concern. The play is an analysis of the complexities of beauty in the modern world. Although Salome can be seen as a liberated woman who uses the power she possesses through her beauty, she is ultimately frustrated and doomed. Beauty is here seen as sexual desire resulting from the act of looking; however, it results not in procreation, but frustration and the death of first the Syrian, then the Page, then Iokanaan and finally Salome herself.

Aubrey Beardsley (1872-1898) often used the peacock and peacock feathers as symbols of decadent beauty. In his final illustration for the published version of *Salome*, *The Climax* (Figure 57) he reduced the peacock tail to a refined background pattern of overlapping concentric circles. In the original sketch that won him the commission (Figure 58), the peacock feathers were boldly stated, but in this final version, they became stylized into a readily recognizable signature motif, set against a large blank area. Beardsley was only twenty-one when he drew these illustrations and their stark message and clear-cut line-block technique increased his fame and notoriety. In *The Climax,* one foreground plant stands upright struggling to survive, but its companion droops flaccidly like a spent force. In the background, a tendril squirms upward more contorted than a young shoot and more like an animal's tentacle feeling its way towards Salome, who represents the unobtainable object of desire. The picture can be interpreted as the terminal point of a public battle between Ruskin's spiritual beauty, Darwin's scientific beauty, and beauty for its own sake—having now become overwrought, even grotesque, with the erotic forcefulness of the modern age. Salome, who has satisfied her desires through exploiting her beauty, looks at the dead head of John the Baptist with unflinching eyes and a cold, calculating look of sexual gratification, thus fulfilling Dostoevsky's promise of ending with the deviant beauty of Sodom.

[102] The text of Oscar Wilde's lecture "The English Renaissance of Art" has been recreated and is available at <http://www.wilde-online.info/the-english-renaissance-of-art.html> [accessed 22 August 2012]. The quotation is from the second paragraph.

Concluding Remarks

It has been shown how Darwin and artists dealt with nature seen subjectively through memory and how beauty has been related to the abstract forms and colours of nature. Multiple connections between Darwin's work and art have been discussed which, however, are linked by a common thread of uncertainty, and the unanchoring or questioning of beliefs rather than a simple grand theme.

It has also been shown how visual images provide a unique way of approaching cultural change. They send what appears to be a clear message across the intervening period but it turns out to be ambiguous and enigmatic. Our decoding of the message is uncertain and fraught with problems of cultural change but in this way, the image highlights the issues and changes being sought.

During the 1860s, one popular view of nature saw it change from a benign source of excitement to the invocation of savage powers and then in the following decade to a fashion accessory. Nature was no longer stable and it became a personal construct like the memory of a dream or a long forgotten scene.

Chapter 4: Body's Beauty

The physical form of the human face and body can be interpreted in many ways, like a work of art. The interpretation changed during the nineteenth century as assumptions about race, gender and class altered. Darwin showed that the beauty of the human face and body are inextricably linked with sexual desire as they were selected over generations in order to attract a sexual partner and artists presented female beauties, sometimes partly dressed, for the male gaze. However, Darwin also argued that the secondary sexual characteristics of men must have been formed through generations of selection by women and he highlighted the involvement of women in the selection process. His ideas raised questions about sexual identity because of the existence of secondary sexual characteristics in both men and women and the inheritance of the appreciation of such characteristics by both sexes. The androgynous forms found in certain artworks and the sexually ambiguous style of dress of the followers of Aestheticism highlighted these questions. Darwin investigated beauty across a wide range of races and found that it differs substantially. Certain artists, such as Rossetti, were also investigating beauty and race although with different cultural assumptions.

The changing representations of the human body have been a rich source of material for art historians of the mid-Victorian period. Writers such as J. B. Bullen and Kathy Alexis Psomiades have placed the body at the centre of Pre-Raphaelite art and Aestheticism and Whitney Davis among many others has looked at other aspects of the body over a longer period.[1] However, a popular and widely discussed source of ideas during this period that is only briefly mentioned by these writers concerned the biological basis of beauty. I discuss various works of art from the point of view of what Darwin and others interested in evolution wrote about beauty and sexual selection. This approach sometimes converges on similar conclusions to those reached by Bullen, Psomiades, Davis and others but from a different perspective that throws new light upon the historic context of the works. Bullen, for example, mentions Darwin once in *The Pre-Raphaelite Body* in terms of his 'attacks on religious orthodoxy' but he does not consider the relevance of Darwin's ideas concerning beauty and desire.[2] However, many of the issues Bullen raises are similar to those raised by Darwin, such as the 'sexualized woman' and 'male desire', as they are based on common cultural issues, but Darwin's approach adds a new biological dimension.

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1 Bullen, *The Pre-Raphaelite Body* (1998), Kathy Alexis Psomiades, *Beauty's Body: Femininity and Representation in British Aestheticism* (Stanford, CA: Stanford University Press, 1997) and Whitney Davis, *Queer Beauty: Sexuality and Aesthetics from Winckelmann to Freud and Beyond* (Chichester: Columbia University Press, 2010).

2 Bullen, *The Pre-Raphaelite Body* (1998), p. 181.

One issue was the role and power of women to select their sexual partners. In most species, the male either fights for the female or attracts the female using sexual ornaments. In humans, both genders have secondary sexual characteristics implying that both sexes are involved in selection. Rossetti's *Bocca Baciata* can be interpreted in terms of the complex negotiation involved in male and female selection. *Bocca Baciata* has been seen as a passive object painted for male enjoyment, with the implication that selection is carried out exclusively by the male.[3] In broader terms, Rossetti's work has been seen as part of the commodification of desire although some commentators have argued that sexual desire was sublimated into aesthetic pleasure.[4]

Darwin believed that our hairless bodies are the result of sexual selection and therefore are a primary source of sexual attraction (see page 65) but artists in the 1850s rarely painted the naked body. One reason was that desire was inappropriate in what Peter Cominos calls the 'Respectable Social System'.[5] Darwin's theory of sexual selection intimately linked beauty with sexual desire but many Victorians found ways to disassociate socially acceptable nudes, such as classical nude sculpture, from any implication of sexual desire. Classical sculpture was often damaged and dismembered and the cold, white marble enabled it to be desexualized. Artists used various conventions to desexualize the nude, such as using chaste poses and expressions, painting the skin to look like marble and placing the nude in a classical setting. These conventions are considered with respect to Watts *A Study with the Peacock's Feathers* and are considered in more detail in the next chapter. Darwin also claimed, as we have seen, that the male beard requires women to have selected bearded men over many generations. This conflict between the beard as a symbol of masculinity and female power is considered with respect to Leighton's *Golden Hours* as well as the issue of effeminacy.

Darwin regarded all humans as a single species and wrote about the common origin of all races. He discussed various forms of racial and regional beauty in order to demonstrate that beauty is relative as it depends on the local history of sexual selection. Darwin's view was controversial, as was his view that most racial differences result from

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3 For example, Griselda Pollock comments on Arthur Hughes's erotic response and Holman Hunt's critical response and their focus 'on the issue of the gaze', G. Pollock, *Vision & Difference: Femininity, Feminism and the Histories of Art* (London and New York: Routledge, 1988), pp. 129-30.

4 Martin A. Danahay, 'Dante Gabriel Rossetti's Virtual Bodies', *Victorian Poetry,* 36:4 (Winter, 1998), 379-98 (p. 381) who refers to an early essay that described how 'even the sexual instinct […] merges in larger and larger measure into the mere aesthetic enjoyment of beauty', Frederic W. H. Myers, 'Rossetti and the Religion of Beauty', in *Essays Modern* (London: Macmillan, 1897), pp. 312-34 (p. 317).

5 'Physical desire in women was practically non-existent, in men strong, but always suspect.' Peter T. Cominos, 'Late-Victorian Sexual Respectability and the Social System', *International Review of Social History,* 8 (1963), 18-48, 216-50 (p. 23).

sexual selection, that is, we are a single species with the races separated by their different views of beauty. A few artists incorporated the beauty of other races, such as the black boy in Rossetti's *The Beloved*, although he may have been included as an ornament to augment female beauty. As well as the racial type, the body was also thought to categorize the class, mental qualities and moral worth of the person and beautiful people have long been associated with positive mental and moral qualities.[6] Leighton's *Daedalus and Icarus* raises questions about the extent to which our assumptions regarding class, role and character are based on beauty.

Chronologically, Darwin started the debate about sexual selection as the root cause of beauty in 1859 and this gave rise to a vigorous debate during the 1860s, but Darwin's detailed exposition and many of the quotations given here are from *Descent* in 1871. I select paintings from the 1860s when this active debate was taking place, but before Darwin had published his detailed description, to show that a broad cultural change was taking place rather than specific changes driven by Darwin's work. Darwin and the artists were influencing public opinion in similar ways but correspondence and articles from the period suggest little direct influence.

Female Sexual Selection

The women in Rossetti's paintings can fruitfully be considered not simply as objects for the male gaze, *femmes fatales* or fallen women, but as agents with their own agenda. Darwin regarded many animals, certainly all vertebrates, as born with certain biological characteristics, instincts and emotions but this does not mean that he was a determinist as he was aware that these traits could be manipulated and overridden by the environment and the animal's ability to make complex choices based on learned criteria.[7] Some commentators have labelled the women in Rossetti's paintings *femmes fatales*, a certain type of woman who seduces men and leads them into danger. The implication of Darwin's argument was that such behaviour is part of the normal social behaviour of most women, and this suggests we should re-examine the paintings in the light of a broader concept of female power. The *femme fatale* was a semi-mythical figure associated with particular although unspecified dangers for the male that could be regarded as going

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[6] Recent research confirms that similar stereotypes still apply, James Andreoni and Ragan Petrie, 'Beauty, Gender and Stereotypes: Evidence from Laboratory Experiments', *Journal of Economic Psychology,* 29 (2008), 73-93. In the test environment, a beauty premium was found but it was based on the assumption that beautiful people are more cooperative. When their actual contribution was made known, which, on average, was no more than other people, then it became a beauty penalty as they appeared more selfish relative to expectations. The other stereotype the research found was that men were regarded as better 'leaders' and this led to a substantial benefit to being male.

[7] Darwin wrote: 'one doubts existence of free will every action determined by hereditary constitution' but a few days later he added 'seeing a puppy playing cannot doubt that they have free will, if so all animals., then an oyster has & a polype', Darwin, *Notebook M*, p. 27, 72.

beyond the normal dangers of courtship. A Darwinian interpretation of *Bocca Baciata* therefore needs to show that the woman is able to select her sexual partner but presents only normal dangers to the man, such as the fact that he might be rejected.[8]

Bocca Baciata

Rossetti broke new ground with *Bocca Baciata* (1859, Figure 5) as the painting marked a distinct change in his style, and it does not fall into any established genre. It was generally admired but Holman Hunt described the painting as advocating 'the animal passion to be the aim of art'.[9] The word 'animal' is the key to understanding the painting as part of a series of cultural changes that began to recognize the new roles for women that emerged as new ideas about our human origins disrupted previous assumptions. Visually, Rossetti broke most of the conventions associated with female representation in contemporary 'books of beauty' by painting the woman in *Bocca Baciata* with fuller, more voluptuous lips, a less pinched face, unrestrained hair and exotic jewellery, in a more compressed space so we feel physically closer to the head and body, which are pressed close to the picture plane.[10] Also significant were his use of thick oils and sensual Venetian colours. Rossetti had been commissioned by George Boyce to paint a portrait of Fanny Cornforth and the heavy, idiosyncratic features reinforce the fact that a particular person was being depicted. Its sensuousness can be judged from Arthur Hughes's comment: 'so awfully lovely. Boyce has bought it, and will I suspect kiss the dear thing's lips away before you can come over to see it.'[11]

One critic of the conventional books of beauty wrote:

> There is not one of these beauties, with her great eyes, and slim waist, that looks as if it had been painted from a human figure. It is but a slovenly, ricketty, wooden imitation of it, tricked out in some tawdry feathers and frippery, and no more like a real woman than the verses which, accompany the plate are like real poetry.[12]

He added that Meadows's *Dolorida* (1838, Figure 59) was one of the three worst plates in the book as it depicted another of his 'fatties in a chemise', which the reviewer thought

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8 See Section 'Female Choice', p. 75 and Darwin, *Descent*, 1st edn (1871), II, p. 358.

9 Letter from William Holman Hunt to Thomas Combe, 'Rossetti Advocating Animal Passion to Be the Aim of Art', 12 February 1860 cited in Pollock, *Vision & Difference: Femininity, Feminism and the Histories of Art* (1988), p. 130.

10 The women portrayed in *Heath's Book of Beauty for 1836* are discussed by Alistair Grieve, 'Rossetti and the Scandal of Art for Art's Sake in the Early 1860s', in *After the Pre-Raphaelites: Art and Aestheticism in Victorian England*, ed. by E. Prettejohn (Manchester: Manchester University Press, 1999), pp. 17-35 (p. 27).

11 Helen Paterson Allingham and E. Baumer Williams, *Letters to William Allingham* (London: Longmans, Green, and Co., 1971), p. 67.

12 [William Makepeace Thackeray], 'A Word on the Annuals', *Fraser's Magazine,* 16:96 (December, 1837), 757-63 (p. 761) writing about Marguerite Blessington, *Heath's Book of Beauty* (London: Longman, Rees, Orme, Brown, Green and Longman, 1837).

would be acceptable if it were a 'good honest fat woman'.[13] Rossetti's image has a full face and chin that do not conform to any of the standard types of beauty, and she has a long neck, which, although it was an established attribute of beauty, is so long and wide that it could almost be considered distorted.

Rossetti was not painting a conventional 'perfect beauty' but a particular person. However, the title also refers us to a story by Boccaccio suggesting the woman was being used to represent the central character who was described as the most beautiful woman in the world.[14] Rossetti may therefore also be representing extreme beauty by the exaggeration of certain features. Darwin understood this when he wrote: 'The men of each race prefer what they are accustomed to behold; they cannot endure any great change; but they like variety, and admire each characteristic point carried to a moderate extreme.'[15] Darwin did not discuss the elongated neck but he and others did discuss exaggerated body parts that enhance the beauty of the woman.[16] In Darwinian terms, the neck is no different from the exaggeration of any bodily part, such as the posterior of Khoikhoi women described earlier (see page 73).[17] Rossetti was emphasizing a certain characteristic regarded as an attribute of beauty close to the point of distortion.

The woman in the painting has been seen as consisting of sexual parts, such as her eponymous mouth as a covert reference to her genitals.[18] In Darwinian terms, both women and men are collections of sexual characteristics that have evolved to excite desire. However, it is interesting to go further than these characteristics and consider the woman as an independent agent. The appropriateness of this interpretation is signalled by Rossetti's representation of the woman's expression. She does not meet our eye, and her pose, though conventional, is made disturbing by her expression, which is vacant and charged with a slight sullenness, like a model who has sat for too long. This suggests

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13 [Thackeray], 'A Word on the Annuals', *Fraser's Magazine,* 16:96 (December, 1837), 757-63 (p. 763).

14 Giovanni Boccaccio (1313-1375) wrote *Decameron* between 1350 and 1353 and it consists of stories of bawdy love with a mystical element framed as ten days of storytelling outside Naples by noble men and women escaping from the plague in Florence. Rossetti is referring to day 2, story 7 and the title of the painting is taken from the last line of the story and means 'The Kissed Mouth'. Rossetti left a slip of paper with the full sentence in the frame. The reference to 'the most beautiful woman then to be found in the world' is from Giovanni Boccaccio, *The Decameron*, trans. by J. M. Rigg (London: A. H. Bullen, 1903), p. 9, Day 2, Story 7.

15 Darwin, *Descent*, 1st edn (1871), II, p. 354.

16 In 1896, the exaggeration of bodily features such as lips, nipples and nails to enhance beauty was described M. F. Regnault, 'Exaggeration as an Aesthetic Factor', *Appletons' Popular Science Monthly,* 49 (October, 1896), 821-28 (p. 821). The article also considers the extent to which classical busts of living people were altered to conform to the conventional ratios associated with statues of gods.

17 Dawson (2007), p. 37. A large posterior was also fashionable in England at various periods, see 'The Bum Shop' of 1785, Diana Donald, *Followers of Fashion: Graphic Satires from the Georgian Period* (London: Hayward Gallery, 2002) and the bustle of the 1870s and 80s, which reached its greatest extent by 1885.

18 Pollock, *Vision & Difference: Femininity, Feminism and the Histories of Art* (1988), pp. 128-31.

volition and agency rather than passivity and so it conflicts with the view of the model as an impassive object. Other aspects of agency and female independence are present in the way Rossetti's has represented his model. For example, compared to women in books of beauty, her nose is not slim and pinched and her forehead is narrow, both signs at the time of a lack of refinement.[19] The shoulders are broad, giving the appearance of physical strength rather than of a delicate and over-refined drawing-room beauty. With her flowing red hair, exotic and excessive jewellery and robust features she could be seen as coarse and sexually experienced. However, although the conventions at the time would therefore label her as a fallen woman, a Darwinian interpretation requires us to consider her and Rossetti's role in the mating game.

Ascribing agency to figures in a painting involves on and off-canvas analysis and in this case possible sources of interpretation include the model, Fanny Cornforth, and Alatiel, the woman in Boccaccio's tale. The analysis can be enhanced by a consideration of the symbolism used by Rossetti. The marigolds behind engulf her like Darwin's 'entangled jungle' crowding her into an enclosed space made more claustrophobic by the way in which the painting is cropped closely around her upper body.[20] The body is cut off from our world by a wide shelf or wall at the bottom in the manner of a Renaissance portrait. She wears marigold jewellery and holds a marigold, suggesting that the flower and its symbolism were important. Conventionally a marigold, in the language of flowers, signified grief, pain, and chagrin, that is, vexation resulting in humiliation or disappointment.[21] Although the woman wears exotic, marigold-coloured jewellery, her distant expression suggests that her deepest emotion could be indicated by the white rose of innocence in her hair. In front of her is a large apple, almost clichéd as a symbol of temptation. We therefore have conflicting symbolism; a voluptuous woman is a temptation but she is marked as innocent. She is shown surrounded by pain and sorrow and has been or will be frustrated and disappointed. Interpreted in Darwinian terms and in the light of Cornforth and Alatiel this can be viewed as a beautiful woman suffering from the consequences of having to make a decision about a sexual partner. Rossetti

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[19] Physiognomy was very popular but doubts were widespread. 'One begins to suspect at length that there is no direct correlation between eyelashes and morals', Eneas Dallas, 'On Physiognomy', *Cornhill Magazine,* 4:22 (October, 1861), 472-81 (p. 477).

[20] There are other possible reasons for the marigolds, such as a reference to those in Giovanni Bellini, *S. Dominic* (1515, Figure 61), referred to in Grieve, 'Rossetti and the Scandal of Art for Art's Sake in the Early 1860s', pp. 17-35 (p. 22).

[21] Many Victorian books help decode the language of flowers. For example, 'Marigold (*Calendula officinalis*).—Pain, chagrin. All the world knows this golden-coloured flower, which symbolizes mental sorrow', Robert Tyas, *The Language of Flowers or, Floral Emblems of Thoughts, Feelings, and Sentiments* (London: George Routledge and Sons, 1869), p. 134, also 'Marigold….Grief', Anna Christian Burke, *The Illustrated Language of Flowers* (London: G. Routledge & Co., 1856), p. 39. Kate Greenaway's well known *Language of Flowers* is later (1884).

indicates she is innocent but engulfed by grief resulting from her natural feelings.[22] In this sense, it is a deeply moral painting as Rossetti is placing us in his position and taking an 'inner standing point' that places us both in her position. The woman is innocent but enclosed in a world that brings pain and sorrow because of the temptation her beauty presents to men and her need to make a decision.[23]

This interpretation is reinforced by a further consideration of the apple. In Christian symbolism, an apple represents temptation although the term 'apple' was not mentioned in the Bible and the fruit in the Garden of Eden was from 'the tree of the knowledge of good and evil'.[24] Theologians disagree about whether the term 'knowledge' should be interpreted narrowly or broadly but the Bible goes on to say that Eve decided to eat the fruit to make herself wise. Adam needed no convincing and ate the fruit he was given, which suggests the serpent chose Eve as she was the hardest to convince and her decision could be seen as the first example of female sexual power in the Christian tradition.[25] In the Biblical account, God was unaware of Adam and Eve's transgression as he was elsewhere in the garden, but when he found out he constructed a complex curse, which included women, in future, experiencing pain during childbirth and obeying men.[26] The acquisition of knowledge was concerned with the recognition of each other's nakedness and this implies that it became associated with sexual desire, which sexual selection equates with beauty. This loss of innocence was represented as the expulsion from a perfect garden and this has been interpreted in Darwinian terms as the evolutionary moment that humans developed a sense of right and wrong.[27] The pain of the woman in *Bocca Baciata* can therefore be associated with the conflict between God's curse obliging her to obey men and her Darwinian freedom to select a partner. Darwin's animalization of the human species during the 1860s enabled human relationships and sexual encounters to be described outside the normal narrow Biblical interpretation.

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22 Darwin did not write about sexual selection in humans until *Descent* (1871) so I am interpreting it with reference to the cultural responses of the period and a possible post-1871 Darwinian interpretation.

23 Note that this analysis is similar to one of the ways Rossetti's poem of the prostitute 'Jenny' has been interpreted; Rossetti is considering his role and the role of the woman simultaneously.

24 *King James Bible* (Cambridge edn.), Genesis 2:17.

25 Lilith is a powerful female figure from Jewish mythology who predates Eve.

26 'Unto the woman he said, I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee', *King James Bible* (Cambridge edn.), Genesis 3:16. This was one consequence of what has been termed 'original sin', which according to the Catholic Church is a weakness and ignorance within human nature and a suffering and concupiscence that pass on to all the descendants of Adam and Eve because of their original sin.

27 Darwin assigned a moral sense to animals; for example, he wrote: 'In this case man is impelled by the same instinctive motive, which caused the heroic little American monkey, formerly described, to attack the great and dreaded baboon, to save his keeper. […] I am aware that some persons maintain that actions performed impulsively, as in the above cases, do not come under the dominion of the moral sense, and cannot be called moral. They confine this term to actions done deliberately, after a victory over opposing desires, or to actions prompted by some lofty motive. But it appears scarcely possible to draw any clear line of distinction of this kind; though the distinction may be real.', Darwin, *Descent*, 1st edn (1871), I, pp. 87-88.

Rossetti's reference to Boccaccio raises the question of the context of interpretation. Was Rossetti referring to a particular woman, to Victorian women, to Boccaccio's heroine or making a broader point? Darwin considered a wide range of racial, tribal and 'savage' social practices and we may need to consider a combination of references that include Cornforth in Victorian London and Alatiel in some exotic medieval country. Darwin wrote: 'in utterly barbarous tribes the women have more power in choosing, rejecting, and tempting their lovers, or of afterwards changing their husbands, than might have been expected.' [28] Darwin then provided a long list of examples of female choice from around the world. In most of the examples, the woman apparently had no choice; daughters were sold to the highest bidder or chased and captured by the man that wanted her. However, in all the cases Darwin provides anecdotal evidence that the woman had more choice than it seemed at first sight. Darwin claimed women 'repeatedly ran away' from their husbands, rescinded what parents had agreed, hid in the woods until the man gave up or simply outran the man.[29] Women tempted the men they preferred and rejected those they disliked, either before or after marriage. Darwin extended this to women in Victorian society but he maintained that they had a 'free or almost free choice' of partner.[30] In a similar way, Rossetti linked two societies in which women, represented by Cornforth and Alatiel, exploited their opportunities within a limited range of options.

Rossetti's symbolism implies temptation followed by fulfilment or frustration, a form of coyness that Darwin gave as an example of how a woman selects from a group of courting men (see page 77). Alatiel was described in Boccaccio's story as coy and her first lover could only overcome her resistance by getting her drunk.[31] Other artists also incorporated coyness in their representation of women and one object used to demonstrate a coy pose was the fan. For example, Leighton's *Pavonia* (1858, Figure 62) shows a dark-eyed Mediterranean woman who turns in her chair not to look at us, but as if to look away from someone else in the room, using a fan to hide her face. The fixed fan has a halo of peacock feathers which would have been seen as exotic, as they were imported from India, and such fans had both literary and classical associations.[32] Although Alatiel was described as coy and her options were limited she did leave behind

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28 *ibid*., II, p. 372. The full quotation is given on p. 281.

29 *ibid*., pp. 372-74.

30 *ibid*., p. 356. Darwin was apparently thinking of women of his own class, such as his wife Emma, as most women at the time, particularly the poor, had little 'free choice'.

31 '[…] determined to enlist Bacchus in the service of Venus. So, ignoring her coyness […]', Boccaccio, *The Decameron* (1903), sentence 26.

32 I am indebted to Mrs H. E. Alexander, Director of the Fan Museum, Greenwich, for the information about this nineteenth-century fan. The literary association is to the Elizabethan period when feather fans were in fashion and the classical association to their use by Roman women, as Leighton would have known. Fans were a common fashion accessory that from the sixteenth century onwards were used by men and women for flirting and as a means of communication referred to as 'fanology'. Charles Francis Badini created a set of codes that were printed on fans by Robert Clarke in 1797, (Figure 60).

her a trail of dead men. Men found her beauty irresistible and typically fought over her. She could therefore be seen as a *femme fatale* as her beauty resulted in their death. However, the deaths resulted from the power of her beauty not from seduction and therefore they were the direct consequence of the 'male gaze'. The story suggests that men are destroyed by their own reaction to female beauty.

The importance of female power was part of Darwin's message and Rossetti and other artists raised questions about the changing nature of human relationships. Darwin found a socially acceptable format by phrasing female power in terms of coyness but many of the critics saw Darwin as engaged in changing the basic assumptions regarding gender roles in society. Rossetti was also criticized for the way his poetry focused on 'mere animal sensations' and there was a new focus on the physical and the sensual.[33] Darwin continually stressed the close relationship and the lack of any fundamental distinction between humans and other animals and this zoomorphism was reflected in the sexual energy implicit in Rossetti's female heads.

The Naked Body

In the early 1860s, it was unusual to see a nude at the Royal Academy but by the 1870s, although only a few were being exhibited they had a significant impact and importance. Their presence indicated changing social attitudes resulting from factors such as artists exploring new ways to make the nude socially acceptable and the popularization of scientific works about sex. Humans are an unusual species of ape as our bodies are mostly hairless (see page 65). One major problem faced by artists was that in the early 1860s it was unacceptable in the 'modest circles' of art to paint the nude figure and a petition was even submitted to Parliament calling for the withdrawal of all Government subsidies from artists drawing from the 'nude female living model'.[34] William Etty, the well-known painter of the nude, had died in 1849 and when his former pupil William Edward Frost exhibited *Panope* in 1862 (Figure 63) the *Art Journal* described him as standing alone as a painter of the nude. There were other examples of the nude, such as Hiram Powers's controversial sculpture, *The Greek Slave* (1844, Figure 64), shown at the Great Exhibition in 1851 and Jean-Auguste-Dominique Ingres (1780-1867) *La Source* (1823-1856, Figure 65), a full-length female nude shown at the International Exhibition in 1862. However, in his review of the International Exhibition, the French critic Gautier concluded that history painting in the French sense had never become deeply rooted in

[33] Thomas Maitland, 'The Fleshly School of Poetry: Mr D. G. Rossetti', *Contemporary Review,* 18 (October, 1871), 334-50. For the many references to Darwin in the 'Fleshly School' controversy see page 142.

[34] 'Nude figures are not those that are elected into the quiet and modest circles, into which the taste for Art has descended.', 'The Royal Academy', *Art Journal,* 6 (June, 1862), 129-38 (p. 130). The petition is mentioned in 'Flannel Petticoats and No Surrender', *Saturday Review of Politics, Literature, Science and Art,* 8:194 (1859), 71-72 (p. 71).

England because of the lack of 'strict drawing based on the study of the nude,—a study which is evidently repulsive to English manners.'[35] In 1863, the poor attendance at life classes was put down to the fact that 'the study of the human figure is not so much believed in as it used to be'.[36] However, this attitude started to change during the 1860s and some commentators have associated the change with the International Exhibition, but many other factors were at work. In the 1860s, Darwin's publication of *Origin* started an acrimonious and public debate about whether we were divinely created or evolved from a common ancestor with the apes. Divine creation was associated with the idea that our bodies were created in the image of God, but Christian tradition also associated them with an 'original sin' that made them shameful.[37] As mentioned, Peter Cominos pointed out that the chaste Victorian woman was assumed to have no knowledge of sex and therefore no physical desire, which enabled men to exhibit their manliness through self-control and continence.[38] The public display of a naked female body therefore constituted a difficult social problem for viewers and various techniques were used by artists to create chaste nudes.

A Study with the Peacock's Feathers

One of the earliest female nudes painted in the 1860s by an English artist was George Frederic Watts's *A Study with the Peacock's Feathers* (painted in 1862 but not exhibited until Gambart's Winter Exhibition in 1865, Figure 6).[39] Watt's painting was reviewed by F. G. Stephens in *The Athenaeum.* He commented on the 'girlish purity' and the 'chaste features' but the painting appears to belie the review, as the 'girl' is a naked woman who is raising her arm above her head exposing her breasts.[40] The young woman is lying on silk sheets, holding exotic peacock feathers above her head and wearing a necklace of amber beads while holding a pearl necklace in her left hand. Her expression can be seen as languid and provocative; her right cheek luxuriates in a soft white downy substance laid on top of the silk sheets, and behind her and around her left arm is scarlet material whose colour suggests passion and is one element of sensual Venetian colouring.

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35 Theophile Gautier, 'English Art from a French Point of View', *Temple Bar,* 5 (June, 1862), 320-26 (pp. 321, 429).

36 'The Royal Academy', *Art Journal,* 24 (December, 1863), 244-45 (p. 245).

37 The link between original sin and sexual desire is controversial and has been debated by the Christian church since the time of Bishop Lyon Irenaeus in the second-century.

38 Cominos, 'Late-Victorian Sexual Respectability and the Social System', *International Review of Social History,* 8 (1963), 18-48, 216-50 (p. 31).

39 The Winter Exhibition was held at Ernest Gambart's French Gallery at 120/121 Pall Mall, which was one of the first and most successful commercial art galleries in London, see Pamela M. Fletcher, 'Creating the French Gallery: Ernest Gambart and the Rise of the Commercial Art Gallery in Mid-Victorian London', *Nineteenth-Century Art Worldwide,* 6:1 (Spring, 2007).

40 F. G. Stephens, 'The Winter Exhibition', *The Athenaeum,* 1984 (4 November, 1865), 618-19 (p. 618).

Her age, her pose, her nakedness, the peacock feathers, the red material, the silk sheets and the jewellery all suggest an erotic interpretation, yet there was clearly some aspect of the woman that Stephens regarded as 'girlish' and 'chaste'.[41] It could be that he was referring to her small breasts as he asked the 'student' to notice 'the superb treatment of the bust, its virginal character'. Stephens referred to the 'girlish purity of the countenance and figure' yet she appears to be about eighteen years old. This implied he thought it was acceptable for a teenage girl to appear naked even though 'carnal knowledge' in relation to a child as young as twelve was not a misdemeanour.[42] It is possible that his appreciation of the qualities of the artwork caused him to want to desexualize the image so that it would be appreciated rather than dismissed. A similar debate had taken place earlier regarding Powers's *The Greek Slave,* which for many became a symbol of Christian purity. The sexual significance of nudity can therefore be seen as a negotiable social convention as long as there is some aspect on which to base an argument for chastity. Stephens interpreted the woman's expression as innocent enabling him to pronounce her virginal and chaste and this made her nakedness as acceptable as it would have been in a young child. This indicates that the artist had to find a way to desexualize the image and the rarity of nudes meant these conventions were still being formulated.

The woman in Watts's painting is unusual in that there are no classical allusions; she is lying on a chair or raised bed and the handling of space places us above and very close to the figure. Her chastity is expressed by her contemplative expression, which places her in her own dream world. The peacock feather she holds had many symbolic associations but in this case, it appears to signal ideal beauty, that is, the woman, like the peacock, represents natural beauty without sexual desire. There are many examples of natural beauty, such as flowers, birds and butterflies, without sexual associations. Darwin explained how this taste evolved through a mixture of the beauty we find in colour and certain forms and our common ancestry, which means that we appreciate many aspects of the world in the same way that other animals do. Darwin was also aware that culture plays a significant part in the appreciation of beauty particularly for paintings. He wrote in Notebook N 'the ignorant, merely looked at pictures as works of imitation. — Hence pleasure in the beautiful, (distinct from sexual beauty) is acquired taste'.[43]

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41 *ibid*. The quotations in the next two sentences are also from p. 618.

42 The *Offences against the Person Act 1861* created a misdemeanour in relation to 'carnal knowledge' of girls between ten and twelve and it was not until 1875 that the age of consent was raised to thirteen under the *Offences against the Person Act*.

43 Charles Darwin, *Notebook N: Metaphysics and Expression* <http://darwin-online.org.uk/content/frameset?itemID=CUL-DAR126.-&viewtype=text&pageseq=1> [accessed 22 August 2012], p. 19.

Another technique for disassociating beauty and sexual desire was the treatment of the skin. The woman in Watts's painting has glowing skin and flushed cheeks suggesting passion. As the naked skin is a powerful sexual characteristic, other artists, such as Albert Moore, modified its colour and texture. His *A Venus* has marble-like skin with the weave of the canvas showing through the paint (discussed more fully later, see page 171). Another artist who painted the nude was Leighton who exhibited *Venus Disrobing for the Bath* in 1867 (Figure 66). The *Art Journal* critic wrote: 'it has a pale silvery hue, not as white as marble, and not so life-glowing as flesh. Thus it will be easily understood that the work has little in common with the *Venus* of Titian, or the figures painted by Etty.'[44] The *Art Journal* also described it as 'eminently chaste', 'unconscious of shame' and even 'laudably emulous of the style of Apelles' and praised it for following the style of a Greek Aphrodite rather than a 'corrupt Roman' Venus.[45] Another work to break these conventions was John Gibson's *The Tinted Venus* (*c*. 1851-6, Figure 67) which aroused a great deal of controversy when it was first shown in 1862 even though it was known that it was the practice in ancient Greece to colour marble sculptures. Some critics saw the sensual in negative terms and equated it with sexual desire and the erotic, and some thought that the beauty of the nude could be divorced from the sensual. In reviews, the nude was often considered in terms of its purity but the question of its sensuality and its ability to arouse desire were not often discussed directly. One of the critics wrote:

> We hear complaints of the 'sensuality' of Leighton [...] This arises from his purely artistic nature [...] when people say that Leighton's *Venus* is sensual, it is because they feel with what delight the artist has studied her form, and in that sense much of the best figure art must be sensual.[46]

This was an unusually clear statement of the Darwinian role of the sensual in the representation of the nude.

We are left with the puzzle of why the nude became acceptable in art galleries during the late 1860s and 1870s. Many reasons have been suggested but the influence of Darwin's ideas should not be overlooked, as an acceptance, or at least a recognition of our animal origins, changes the nature of the role of the nude. It has often been argued that a clear distinction exists between the artistic nude and the naked body and we have seen how, in the nineteenth century, many conventions governed the representation of the naked body in art.[47] Darwin's ideas and the hairless body as a secondary sexual characteristic introduced a tension that created a role for the nude as a naked body precisely because of the ambiguity between the two possible schemata for decoding the representation and this generated multiple interpretations that justified its role.

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44 'The Royal Academy', *Art Journal* (1 June, 1867), 137-46 (p. 141).
45 *ibid*.
46 'Pictures of the Year XIII', *Saturday Review,* 24:613 (27 July, 1867), 116-17 (p. 117).
47 The distinction was defined in Kenneth Clark, *The Nude: A Study in Ideal Form* (London: John Murray, 1956), pp. 1-25, Chapter 1, 'The Naked and the Nude'.

The Beard and Masculinity

The beard is an intriguing symbol as it is one of the few male sexual characteristics described by Darwin. In Victorian society, the female was most often thought to be the one that was beautiful but the beard is an example of an 'ornament', like the peacock's tail.[48] Although in paintings, the beard was often an attribute of masculinity, one artist who tackled its conflicting associations was Leighton in his *Golden Hours* (1864, Figure 7). He deconstructed this overtly masculine symbol by representing it in a sexually ambivalent manner that some critics saw as effeminate.

The beard, like many sexual characteristics went in and out of fashion. In the early part of the nineteenth century, most men in England were clean-shaven, although sideburns and moustaches were popular. The beard was associated with the French and the Irish and therefore with revolutionaries and anarchists, but it suddenly became a popular fashion accessory after 1848 and it is found in many paintings over the subsequent decades. It has been suggested that this was because the revolutionary concerns that spread across Europe in 1848 had a peaceful outcome in England and this reduced the associations the beard had with revolution.[49] This allowed the pre-existing associations it had with the socially positive aspects of masculinity to dominate. The fashion also indicates that men felt a need to assert their masculinity through the display of an overt secondary sexual characteristic, which could be associated with the rise of female emancipation and female power during the 1850s and 60s. There was surprise at the time at the rapidity with which the fashion became popular, and the beard became associated with the military and positive historical figures. Many claimed it brought health benefits but there appears to have been no single, simple trigger event for the fashion.[50] Paintings of the 1860s and 70s show about a third of the males with beards; for example, in James Tissot's *The Ball on Shipboard* (1874, Figure 68) there are at least six men with beards and only two without. In the early part of the century few men had beards as is indicated by Daniel Maclise's *The Death of Nelson* (1859-64, Figure 69), which represents the men of 1805. Of the fifty-five men with visible faces only three have

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48 Men were described as handsome but there is little distinction between the use of this term for men and 'beautiful' for woman as both imply an appearance that evolved to be attractive to the opposite sex.

49 Oldstone-Moore, 'The Beard Movement in Victorian Britain', *Victorian Studies,* 48:1 (Autumn, 2005), 7-34.

50 The beard was described as keeping the throat warm and protecting it from infection, see Gowing, *Philosophy of Beards: A Lecture Physiological Artistic & Historical* (1850). Another article explained: 'In a sanitary point of view, the ecclesiastic and the soldier stand nearly together. Does the campaigner ask a natural protector from the damp of the bivouac and the dust of the march, the clergyman requires the same for his constant country rides and his cottage evening lecture.' J. S. V., 'The Beard Movement', *Once a Week,* 4:92 (March, 1861), 377-78 (p. 377). However, this view was largely discredited at the time. Such an explanation, if true, would mean it was the result of natural selection rather than sexual selection. Darwin thought its racial specificity made it more likely to result from sexual selection.

beards, although at least nine have long sideburns, and of the eighteen visible men in David Wilkie's *Chelsea Pensioners Reading the Waterloo Dispatch* (1822, Figure 70) none have beards although a few have moustaches.

Golden Hours

In Leighton's *Golden Hours* (1864, Figure 7) the man can be interpreted as more conventionally feminine than the woman can. He is wearing a soft, loose jacket with a ruffled neckline held by a dainty ribbon; he is physically lower than the woman, slouches in his chair with half-closed eyelids and his hair is long, like the conventional depiction of a female seductress. Hair is a powerful sexual symbol. Elizabeth Gitter wrote: 'The more abundant the hair, the more potent the sexual invitation', and although she was writing about female beauty, Darwin's work suggests that the issues are more complex and we should include the beauty of men's hair.[51] His thin, delicate fingers further conform to the conventional view of a female figure and they brush but do not depress the keys of a harpsichord ornamented with marquetry and a painted scene of a couple. The woman, though, adopts masculine traits as she hides her features and so protects herself from any intrusive gaze and she turns her back to us presenting a protective shell of padded and voluminous material. Its light colour is picked up by the light patch on the gold wall behind the man, encompassing him in her web of selection. She leans towards him dominating his presence as he leans away from her with his head lowered in submission, looking at the keyboard on which he appears about to perform for her. She is painted more firmly with crisp folds in her silken skirt and sleeves; her hair is pinned back signifying self-control and restraint and her fingers look as if they are playing the harpsichord keys in her imagination. Her dominant position suggests that she is the one in control, raising questions about female power.[52]

Golden Hours appears to invert the normal conventions of male and female courtship, suggesting that Leighton was exploring questions regarding gender roles. The beard was conventionally often regarded as a sign of virility but Darwin's theory implies it is a sign of female selection and therefore female empowerment although the lack of

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[51] Elizabeth Gitter, 'The Power of Women's Hair in the Victorian Imagination', *Transactions and Proceedings of the Modern Language Association of America,* 99:5 (October, 1984), 936-54 (p. 938). Long hair on men has also had many other associations; Samson said: 'if I be shaven, then my strength will go from me', *King James Bible*, Judges 16:17. The Franks (420-451 CE) believed 'the royal fashion of long hair was the ensign of their birth and dignity', Edward Gibbon, *The History of the Decline and Fall of the Roman Empire* (London: T. Cadell, 1837), p. 540.

[52] In contrast, Leighton's *The Painter's Honeymoon* (1864, Figure 71) shows the same model but sitting alongside his wife with their cheeks almost touching and holding her hand while he draws.

beards in some races shows that there is no simplistic link to virility.[53] Virility implies power and forceful selection by the male but Darwin and Leighton show that a more balanced view is possible. The man in the painting was described as effeminate by critics, which was a common criticism about particular paintings and sometimes about artists. It was often associated with the Aesthetic Movement, and the database of *British Periodicals Online (1680-1930)* shows the term was used in about 4,000 articles between 1859 and 1882 and its use peaked in the 1860s and 1870s. It was often used in the first paragraph of an article to set the scene, for example, 'effeminate and ultra-refining' in an article about French literature, 'effeminate luxuriance' in an article referring to southern Europe, 'effeminate luxury' in an article about Cuba.[54] The term did not have its modern connotations of homosexuality, a word that was not used during the period.[55] Music from thirty years before was regarded as 'an effeminate waste of time' and the Macaronis (extravagant English dandies of the 1770s) were described as effeminate.[56] Although it was often used to describe aesthetes and aesthetic art, it appears to have been a general term of criticism. The Macaronis, for example, were men who had been on the Grand Tour, and were described as 'a kind of animal, neither male nor female, a thing of the neuter gender'.[57] However, Macaroni was also described in the same article as 'fond of gambling, drinking, and duelling' and 'it talks without meaning, it smiles without pleasantry, it eats without appetite, it rides without exercise, it wenches without passion.' Maybe the modern English equivalent for 'effeminate' would be closer to dissolute and lacking moral restraint.

'Effeminate' was frequently used to describe certain forms of art. The *British Periodicals* database lists 66 references to 'effeminate' in association with 'Royal Academy' over the same period. It was used by W. M. Rossetti to describe Leighton's

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53 Male sexual characteristics develop during puberty triggered by the male hormone testosterone and so it is possible that such characteristics are more highly developed in males with an excess of this hormone, which could be positively correlated with virility. However, virility is a complex trait that does not have a simple cause.

54 Adolph Henselt, *The Monthly Musical Record* (1 December, 1880), 164-67 (p. 164), Charles W. Wood, 'About Norway', *The Argosy : a Magazine of Tales, Travels, Essays, and Poems* (January, 1880), 42-55 (p. 42), 'Life in Cuba', *The Sixpenny Magazine* (February, 1864), 133-40 (p. 133).

55 The Oxford English Dictionary lists the first use of the word 'homosexual' and 'homosexuality' in Richard von Krafft-Ebing, *Psychopathia Sexualis*, trans. by Charles Gilbert Chaddock (Philadelphia and London: The F. A. Davis, 1892), p. 185. It can be argued that the word does not create the orientation although this is what Michel Foucault argues did happen in the nineteenth century when the hegemony of medical pathology created the idea of sexual orientation. Oscar Wilde presented himself as an 'effeminate dandy' but even those who knew him well were surprised to find out about his homosexuality, see Alan Sinfield, *The Wilde Century : Effeminacy, Oscar Wilde and the Queer Moment* (London: Cassell, 1994), p. 2.

56 'Musical and Dramatic Gossip', *The Athenaeum* (6 January, 1866), 23-24 (p. 23) and 'Extravagant Dandyism', *Bow Bells : a Magazine of General Literature and Art for Family Reading* (20 January, 1869), 621-22 (p. 621).

57 Joseph Twadell Shipley, *The Origins of English Words: A Discursive Dictionary of Indo-European Roots* (Baltimore, MA: JHU Press, 1984), p. 143. Shipley is quoting the *Oxford Magazine* of 1870 and he gives the origin of the word as the *Macaroni Club*, founded *c*. 1760.

work in 1864 and, in 1879 it was even used to describe the knight's face in *In Manus Tuas, Domine*, a painting by Briton Rivière (Figure 72).[58] The *Magazine of Art* thought there was 'no better antidote to the too effeminate and idyllic art' than 'a healthy and vigorous school of military painting'.[59] The contrast tells us a lot about the meaning of the word. It was used to describe things that were regarded as unhealthy and lacking vigour, particularly those that lacked any of the attributes then associated with masculinity. The Aesthetic Movement brought with it a fashion that many thought was undermining society, and one aspect of that concern was associated with effeminacy. Darwin's theory of sexual selection was focused on procreation and the role of the sexes in selection, and was in one sense 'manly' although manliness was also associated with self-restraint. Darwin's theory appeared to find no role for effeminacy in the sense of being unhealthy and lacking vigour, but it had a part to play in undermining the conventional roles of the sexes and recognizing that 'manliness' was an artificial social construct.

Critics were also concerned about effeminacy in the work of particular artists. Bernard Cracroft in *The Fortnightly Review* was pleased that Leighton had 'slowly risen beyond the effeminate conceits of modern society' with his *Helios and Rhodos* (1869, Figure 73) and *Daedalus and Icarus* (Figure 9).[60] Nevertheless, he still described *Helios and Rhodos* as a 'feminine picture'. He praised its beauty, harmony and pure outlines but described it as being like an artificial perfume in that it appeared to have been collated from studies. He objected to Leighton's long list of paintings of 'diaphanous females, affecting to be unaffected, in sundry postures of laborious ease, with peacocks, pigeons, fountains, or other paraphernalia of ostentatious purity.' Colvin referred to the lack of 'moral teaching or dramatic energy' in Leighton's paintings.[61] The closeness with which critics watched Leighton's masculinity can be seen by the frequent references to his effeminacy and that of the figures in his paintings. The term 'effeminate' can be used to refer to a figure in a painting or the painting style and Leighton had both criticisms levelled against him; for example, in *Vanity Fair* (29 June 1872, Figure 74) an illustration of Leighton suggests that he was one of the first artists to adopt a decadent, effeminate *fin-de-siècle* persona. In the background, three female 'graces' appear to be choosing Leighton who slouches against the doorjamb looking like 'the Venetian painters' idea of

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58 In 1864, it was used four times in two articles both of which were describing Leighton's painting. In 1879, it was used fourteen times, in one article to describe a work by Burne-Jones and to describe a work by Albert Moore as not effeminate as he painted for 'mere decoration' and drew 'solidly and strongly', 'Pictures of the Year-3', *Magazine of Art* (January, 1879), 161-65 (p. 165). The knight's face was described as 'not a shade too effeminate', 'Royal Academy Supplement', *The Examiner,* 3719 (May, 1879), 1-4 (p. 2). The title means 'Into your hands, Lord'

59 'The Royal Academy: Third Notice', *Magazine of Art* (January, 1878), 101-06 (p. 103).

60 Bernard Cracroft, 'The Academy of 1869, Part 2', *Fortnightly Review,* 6:31 (1 July, 1869), 46-57 (p. 50).

61 Sidney Colvin, 'English Painters and Painting in 1867', *Fortnightly Review,* 2:10 (October, 1867), 464-76 (p. 473).

Christ'.[62] The critics regarded beauty without a moral lesson as seductive and therefore unmanly yet both the artists and Darwin were proposing amoral beauty. Another criticism of the painting's effeminacy was from W. M. Rossetti:

> One of his pictures seems to us only just to miss being one of the finest successes of the year, and yet to miss it—the *Golden Hours*. [...] but the total impression of the picture appears to us to be marred by the effeminate type of the man, who, being engaged in the comparatively sentimental occupation of playing music, needed to be kept up to the point of manliness rather than down to that of suavity.[63]

Rossetti went on to make an intriguing point about the model:

> We are aware that this is a portrait, and not an untruthful one, of a Roman model, the same who appears in the study, *A Roman Labourer*, by that very able portrait-painter Mr. Wells. Mr. Leighton is not to be blamed for unmanning a strong face, but we may question his discretion in selecting one wherein beauty is not modified by some robuster qualities.

It is not clear that a genre scene of two figures would normally be classified as a portrait unless Rossetti was trying to make a particular point regarding the model as an individual. He blames Leighton not for painting a strong face in an effeminate way ('unmanning') but rather for selecting a particular model known for his beauty. This is surprising as unmanning requires a conscious effort to change the model's features but Leighton, it appears, painted a recognizable portrait of a particular model. This suggests Rossetti was objecting to the reputation of the model. Leighton had selected a model known for his effeminacy to present the fashionable male beard in a setting that undermined its conventional masculinity. The beard's symbolic masculinity is demonstrated by the comment: 'Sometimes the clergy have been forbidden to shave, shaving being effeminate'.[64] This is reinforced by an anonymous article in *Vanity Fair* that was critical of the Aesthetic Movement, presenting the aesthete as a modern young man with an 'utter hatred of manliness' who models himself on the 'female adolescent' and who 'looks with horror on the manly beard'.[65] Rossetti's questioning of Leighton's

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62 George R. Halkett, 'The Royal Scottish Academy Exhibition', *Magazine of Art,* 4 (January, 1881), 260-64 (p. 260).

63 William Michael Rossetti, 'The Royal Academy Exhibition', *Fraser's Magazine,* 70:415 (July, 1864), 57-74 (p. 57).

64 V., 'The Beard Movement', *Once a Week,* 4:92 (March, 1861), 377-78 (p. 377).

65 Bullen, *The Pre-Raphaelite Body* (1998), p. 201 quotes 'The Last Thing in Young Men', *Vanity Fair,* 26 (1881), 277-78. The modern young man has learned his 'utter hatred of manliness' at university and he 'paints his face', 'never shoots or hunts' but instead plays 'duets on the pianoforte' reads poetry aloud and enjoys taking female roles in amateur theatricals. He is sexless, 'his name is never coupled with any woman' and 'he never even flirts with anybody'. As early as 1870, Alfred Austin had linked 'the disease of our time' with which 'the whole community is infected' as aestheticism. Burne-Jones is implicated in the article with the whole process of unmanning men.

discretion in selecting the model also suggests he could be warning Leighton to avoid exposing his sexual preferences.[66]

Leighton shows us a male sexual characteristic, the beard, that results from female sexual selection, which compromises the apparent masculinity of the symbol, which is then further compromised by the use of an effeminate model and by the overt display of female power. Effeminacy, that is a failure to live up to the role expected of a Victorian man, was seen as undermining society. However, many socially acceptable roles, such as the priest do not conform to the conventions of manliness but have avoided the accusation of effeminacy by defining for themselves a socially acceptable role. Women were defined by the particular role they had helping men and Leighton can be seen as deconstructing men's social role in order to create a new one as a woman's companion.

Racial Beauty

There were few examples of non-European figures in fine art of the mid-Victorian period except for the common genre of oriental paintings, ethnographic and travel book illustrations and representations of the iniquities of the slave trade.[67] The representation of black people tended to be limited to a few well-known black models, such as Jamaican-born Fanny Eaton who was sketched by Rossetti (1865, Figure 75), Moore (*The Mother of Sisera Looked Out at a Window*, 1861, Figure 76) and Simeon Solomon (*Portrait of Fanny Eaton*, 1860, Figure 77). Joanna Boyce made a study of Mrs Eaton in 1861 showing her head and shoulders in profile, *Head of a Mulatto Woman (Mrs. Eaton)* (1861, Figure 78).[68] Another example is Rossetti's *The Beloved* (1866, Figure 8) which Paul Barlow suggests influenced Millais who produced *Jephthah* (1867, Figure 79) the following year.[69] Rossetti's selection of a mixed race girl, later replaced by a black boy, raises the question of whether beauty is independent of race or whether he selected models with Westernised features or modified their features to conform to Western tastes.

Whether there is such a thing as absolute beauty that is independent of race and culture is discussed more fully in the next chapter. Darwin argued that beauty is arbitrary

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66 Leighton's homosexuality has been the subject of debate among modern art historians and the evidence is not conclusive, see Christopher Reed, *Art and Homosexuality: A History of Ideas* (Oxford: Oxford University Press, 2011), p. 84.

67 A useful overview is provided by Marsh, *Black Victorians: Black People in British Art 1800-1900* (2005).

68 *ibid*.

69 Barlow, *The Art of John Everett Millais* (2005), p. 109.

and relative to race and culture, as Reynolds had done one hundred years previously.[70] However, unlike Darwin, Reynolds thought we learn to recognize beauty entirely through experience. He wrote: 'To distinguish beauty, then, implies having seen many individuals of that species' and he went on to say the only reason we prefer the colour of Europeans rather than Ethiopians is custom.[71] Darwin thought we had all evolved from a common ancestor that had come out of Africa, and racial differences were evidence for his theory of sexual selection.[72] For example, Darwin thought the large posterior of Khoikhoi women was evidence that variation between races was a result of sexual selection but it was not evidence that different races were different species.

Darwin showed that racial beauty engages with a far wider range of features that appear to Western culture as disfigurations. Many races enhance their beauty using ornamental devices such as noses 'pierced, with rings, sticks, [and] feathers' or a pelelé in the upper lip, which Darwin found 'hideous'.[73] Darwin made the tentative suggestion that the sense of beauty in such races is 'not so highly developed' as in birds, but this is difficult to reconcile with his argument that all human races are the same species. He provided a more likely explanation, namely that the appreciation of certain types of beauty is unique to humans as they depend on complex cultural associations. Darwin assumed that 'high tastes' are only possessed by civilized nations and not by 'barbarians or by uneducated persons'.[74] In this context, classical beauty can be seen as an alternative 'fashion' for the educated viewer because of its scholarly associations.

The Beloved

During the 1860s the abolition of slavery in America was widely debated and in 1861 when the American Civil War broke out Richard Ansdell (1815-1885) exhibited *Hunted Slaves* (1861, Figure 80) at the Royal Academy. In 1865, Darwin's new theory of human origins was still being debated when Rossetti painted *The Beloved*. It was a relevant time to represent a beautiful black person, as the total abolition of slavery (except as a

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70 'I have no doubt but that if we were more used to deformity than beauty, deformity would then lose the idea now annexed to it, and take that of beauty: as if the whole world should agree, that yes and no should change their meaning; yes would then deny, and no would affirm.' Reynolds, 'The Idea of Beauty', *The Idler,* 82 (10 November, 1759), the original article had no title.

71 For the full quotation, see Appendix 1, page 237.

72 Darwin believed 'it is somewhat more probable that our early progenitors lived on the African continent than elsewhere', Darwin, *Descent*, 1st edn (1871), I, p. 199. Also see, Desmond and Moore, *Darwin's Sacred Cause: Race, Slavery and the Quest for Human Origins* (2010), fig. 16 (opposite p. 171) from Merriman, 1854. Regarding whether humans are one or many species, Darwin wrote: 'Finally, when the principles of evolution are generally accepted […] the dispute between the monogenists and the polygenists will die a silent and unobserved death.' Darwin, *Descent*, 1st edn (1871), I, p. 235.

73 Darwin, *Descent*, 1st edn (1871), II, p. 341.

74 *ibid*., I, p. 64.

punishment for crime) had just been finalized in America by the Thirteenth Amendment.[75] It appears from his brother's writing that Rossetti had 'no very settled ideas' about slavery and found Carlyle's support of slavery amusing.[76] Rossetti was commissioned by George Rae during 1864 to paint *The Beloved* and the correspondence, which largely consisted of reasons for his delay, continued for eighteen months.

The painting shows five dark-haired figures surrounding a central female figure with red hair and green eyes.[77] The central character of the bride was modelled by Marie Ford, the bridesmaid on the left by Ellen Smith and the bridesmaid on the right by Keomi Gray, a gypsy who frequently modelled for Frederic Sandys. It appears that Rossetti was specifically representing a mixture of racial types albeit all, except the black figure, of European origin. Red hair and green eyes were associated with the Celtic race and in the Middle Ages with witches. In an article in *Temple Bar* a few years later, they were described as the attributes of 'the vampire who lives upon the hearts of men'.[78] In a review of *The Wicked Woman* by Gertrude Fenton, the eponymous woman is a double murderer who 'lives in chronic antagonism to the seventh commandment', and has 'red hair, and sea-green eyes'.[79] Green eyes and red hair were associated in both reviews and novels with seductive and dangerous women, although it was regarded as an overused stereotype. It is likely that Rossetti was aware of these associations when choosing the attributes of the central figure, who in the Bible is a dark-skinned or black woman. It is interesting that he chose a white woman to represent her but selected a black person to represent the servant. He claimed that the latter choice was simply to add black to the colour balance, but his careful choice of model and his repainting of the

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75 The Thirteenth Amendment of 6 December 1865 was not ratified by all the states immediately; it took Mississippi until 16 March 1995.

76 'My brother had no very settled ideas about negroes, their rights and wrongs: he knew, and was much tickled by, Carlyle's "Occasional Discourse on the Nigger Question"', *The Works of Dante Gabriel Rossetti*, ed. by William Michael Rossetti (London: Ellis, 1911), p. 675. Carlyle's work was first published in *Fraser's Magazine* in 1849 and is seen by some as criticising the hypocrisy of those who ignored the poor in Britain where the death rate for working class children in Manchester was the same as for southern slaves in America at 50% for children under five.

77 The following information is partly based on H. C. Marillier, *Dante Gabriel Rossetti, an Illustrated Memorial of His Art and Life* (London: George Bell and Sons, 1899), p. 140, Virginia Surtees, *The Paintings and Drawings of Dante Gabriel Rossetti (1828-1882). A Catalogue Raisonné*, 2 vols (Oxford: Oxford University Press, 1971), I, pp. 104-05, *ibid*., II, plate 263 and Virginia Surtees, *The Diaries of George Price Boyce* (Norwich: Real World, 1980), p. 42.

78 'Flirts and Flirtation', *Temple Bar, a London Magazine for Town and Country Readers* 26 (April, 1869), 58-67 (p. 64). This common attribution was described as a myth.

79 'Novels of the Week', *The Athenaeum,* 2242 (October, 1870), 491-93 (p. 493). The seventh commandment is 'Thou shalt not commit adultery', *King James Bible*, Exodus 20:14.

figure appear to give the figure more significance.[80] He claimed to be creating a decorative form rather than making a political point, but the painting inevitably reflects his cultural biases and beliefs.

The frame includes three Biblical texts from two sources:

> My beloved is mine and I am his.
>
> (Song of Solomon 2: 16, part of verse, *King James Bible*)

> Let him kiss me with the kisses of his mouth:
> For thy love is better than wine.
>
> (Song of Solomon 1:2, *King James Bible*)

> She shall be brought unto the king in raiment of
> needlework: the virgins that be her fellows shall
> bear her company, and shall be brought unto thee.
>
> (Psalms 45:14, *The Book of Common Prayer*)

The 'Song of Songs' of Solomon is believed to date back to *c*. 900 BCE and is a book of the Hebrew Bible. The book describes how the relationship of a woman, the 'Shulamite', and a man evolves from courting to consummation. Allegorically, in the Christian tradition, it has been seen as representing the relationship between God and the Church or Christ and the human soul. The Song of Solomon also includes the lines:

> I *am* black, but comely, O ye daughters of Jerusalem, as the tents of Kedar, as the curtains of Solomon.
>
> Look not upon me, because I *am* black, because the sun hath looked upon me: my mother's children were angry with me; they made me the keeper of the vineyards; *but* mine own vineyard have I not kept.[81]

The text refers to the speaker, a woman, possibly the Queen of Sheba. Some commentators maintain that the woman is white but suntanned and later versions of the Bible translated the second verse as, 'Look not upon me, because I am swarthy, because the sun hath scorched me' (*English Revised Version*).[82]

The black figure in *The Beloved* is set in an exotic scene but it is different in that it appears to be a portrait, that is, an accurate depiction of a particular person, or possibly a

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[80] He wrote, 'jet would be invaluable', letter dated 19 March 1865, *The Correspondence of Dante Gabriel Rossetti: The Chelsea Years 1863-1872: Prelude to Crisis*, ed. by William Evan Fredeman, 9 vols (Woodbridge, Suffolk: Boydell & Brewer, 2010), III, p. 271. It has been suggested that the use of a black figure was inspired by seeing Manet's *Olympia* in his studio in November 1864, *The Age of Rossetti, Burne-Jones & Watts Symbolism in Britain 1860-1910*, ed. by A. Wilton and R. Upstone (London: Tate Gallery Publishing, 1997), p. 101.

[81] *King James Bible*, Song of Solomon 1: 5-6

[82] Other commentators equate her blackness with her sinfulness; see <http://bible.cc/songs/1-5.htm> [accessed 22 August 2012].

concatenation of people. Surtees includes two sketches in her *Catalogue Raisonné*, one of a black boy (Figure 83) and the other a black girl (Figure 84); the figure in the painting is that of the boy.[83] The painting shows us a strong, self-contained black figure in the foreground wearing more jewellery than any other figure, but the fewest clothes. The painting of the boy is more energized than the drawing because he is looking more directly at us, and the chiaroscuro is more pronounced, drawing attention to the eyes. The jewellery also singles out the black figure and the symbolic cup draws attention to his role. The role of cupbearer is significant in mythology, but in this case, a young black servant or slave is holding a symbolic reference to the beauty of the central figure.

One puzzling aspect of the black figure is the gender. George Price Boyce saw the painting on 5 March 1865 and wrote that Rossetti had 'painted my green Japanese lady's dress exquisitely on to Miss Ford and a jewel I lent him on to the nigger girl's hair.'[84] On 9 April he added: 'he has painted in a little nigger boy splendidly' suggesting the figure had already been changed to that of a boy. Rossetti's correspondence with George Rae about *The Beloved* was from September 1864 to February 1865 and his first mention of the black figure is in a letter of 20 December 1864 when he describes it as 'a little black girl carrying a cup before the bride'. On 28 December 1864 he wrote: 'I have found a mulatto girl very suitable for my picture' but on 19 March 1865 he added: 'One change I propose is to take out the little mulatto girl and paint in a pure black girl or boy if I can get one. I mean the colour of my picture to be like jewels and the jet would be invaluable.' According to his brother William Rossetti, he originally planned a mixed race girl as the cupbearer but in March 1865 resolved to substitute a boy. It is not clear whether he decided to change the girl to a boy and then looked for a model or the decision was the result of seeing the boy outside a London hotel. The phrase 'if I can get one' suggests he specifically decided to change the gender of the model. It appears that between 19 March and 9 April he found the black boy and repainted the figure. The two drawings make it clear that the figure is a boy, although without the drawings, the gender is less certain and it could be a girl, particularly as there is a suggestion through shading of an immature girl's breast. It is also interesting to ask why Rossetti substituted a black boy for the black girl. If the girl had been used, she would have been more intimately associated with the rest of the group through gender and beauty. Possibly Rossetti wanted a person of darker colour or the boy created a clearer distinction between the central figure with her companions and the servant or slave figure. The girl would have

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[83] Rossetti found the boy outside a hotel and asked his master if he could use him as a model. William Michael Rossetti, *Rossetti Papers 1862 to 1870: A Compilation by William Michael Rossetti* (New York: Scribner's, 1903), p. 175.

[84] In the nineteenth century the word 'nigger' was not always used pejoratively, see *OED* 'nigger, 1a, list of uses 'as a relatively neutral (or occas. positive) term, with no specifically hostile intent.' <www.oed.com> [22 August 2012].

competed in terms of her beauty and raised the question about whether she was a companion or servant.

Rossetti shows a range of facial types but they are selected with a Western European idea of beauty and most of the figures are models known for their beauty. Did Rossetti select the boy for a similar reason? Even the attempt to represent a face accurately is not a neutral activity as biases can creep in from the artist's culture, and all styles of representation reflect the cultural heritage of the period. The boy's mouth, for example, is narrow with full lips and a slight pout reflecting the way Rossetti represents the sensual female mouth and the tilt of his head mirrors that of the central figure.

Rossetti used ornaments to enhance the beauty of the women in the painting by framing or drawing attention to sexual characteristics, such as a long neck or a symmetrical face. All the figures are wearing some type of ornament in the form of jewellery. As mentioned above, Rossetti intended the colour of his painting 'to be like jewels' and he filled the picture with jewels.[85] The bride wears a Burmese bracelet on her wrist and a blue Chinese feather headdress that was changed to red when he retouched the painting in 1873.[86] The cupbearer wears a necklace borrowed from Boyce, who might have acquired it in Egypt in 1861-2.[87] Boyce also supplied the Japanese robe worn by the bride and the large pendant worn by the boy is North African. The pearl pin worn by the bridesmaid was always one of Rossetti's favourites and when he first bought it he was so excited he asked his friend, the respected Dutch art dealer Murray Marks (1840-1918) to come and see it. Expensive and rare ornaments indicate wealth and status, but the jewellery on the boy appears to have a different significance. It is being used as a symbol not of his status but of that of his mistress or owner, and he is therefore being used as a form of ornament both, as a black 'jewel' within the colour scheme and as a bejewelled cupbearer within the painting's narrative.

Beauty and Class

Class was closely linked with appearance in the Victorian period through the pseudo-sciences of phrenology and physiognomy. The association of physical appearance with character and moral worth went back to the ancient world, and these ideas were reinvigorated by Johann Kaspar Lavater (1741-1801) whose books became popular in England in the early nineteenth century. Another approach to linking appearance and character was phrenology, which linked measurements of the skull to particular mental faculties. Franz Joseph Gall (1758-1828) developed these ideas in the early nineteenth

[85] Rossetti, *Dante Gabriel Rossetti as Designer and Writer* (1889), p. 51.
[86] Shirley Bury, 'Rossetti and His Jewellery', *Burlington Magazine,* 118:875 (February, 1976), 94-102 (p. 98). Chinese feather headdresses were made with blue kingfisher feathers.
[87] Rossetti, *Dante Gabriel Rossetti as Designer and Writer* (1889), p. 51.

century and although they were widely dismissed in Continental Europe, they found favour in England. They were popularized by George Combe (1791-1855), whose views were controversial as they clashed with those of the Church both because he firmly linked mind and brain and because he promoted the idea of our inexorable progress which contradicted the Christian view of our 'degradation and fallibility'.[88] Darwin was sceptical about phrenology and wrote to William Darwin Fox (1805-1880) on 3 January 1830 to say he had had dinner with James Mackintosh (1765-1832) who had argued against it on the basis that education changes the power of the organs of the brain, so such powers cannot be innate.[89] The link between physical appearance, beauty and moral worth is still with us today.[90]

Wallace was a life-long believer in phrenology and one of the earliest writers to link Darwinism with socialism.[91] Following Darwin's death, many other writers made the connection between his work and social progress and the associated danger of degeneration, and one popular novel that described how Southern England could become a socialist utopia was William Morris's *News from Nowhere*. Morris and many other socialists, such as Peter Kropotkin (1842-1921) and Ernest Belfort Bax (1854-1926) believed in a form of neo-Lamarckian evolution. This was linked to a process of 'making socialists' through right living, leading to a 'radical transformation of humanity' through Lamarckian change.[92] In Morris's book, right living leads to the evolution of a perfect socialist society inhabited by beautiful and happy workers. This and other writers' ideas of Social Darwinism developed in the 1880s and 1890s, but in the 1860s, when Leighton painted *Daedalus and Icarus,* social concerns were about our racial and ape origins.

Daedalus and Icarus

Leighton's *Daedalus and Icarus* (1869, Figure 9) invokes various stories regarding the mythological figures in the Roman poet Ovid's *Metamorphoses*.[93] Daedalus created a labyrinth to enable King Minos to hide the shameful Minotaur—the offspring of his wife,

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88 T. M. Parssinen, 'Popular Science and Society: The Phrenology Movement in Early Victorian Britain', *Journal of Social History,* 8:1 (Autumn, 1974), 1-20 (p. 5).

89 Letter from Charles Darwin to William Darwin Fox, 'Mackintosh Dismisses Phrenology', 3 January 1830, Christ College, Cambridge. Phrenology was never accepted by mainstream science although many scientific studies were conducted. The last serious book on the subject in nineteenth-century England was Daniel Noble, *The Brain and Its Physiology* (London: John Churchill, 1846).

90 Hamermesh, *Beauty Pays* (2011), pp. 3-4.

91 Parssinen, 'Popular Science and Society: The Phrenology Movement in Early Victorian Britain', *Journal of Social History,* 8:1 (Autumn, 1974), 1-20 (p. 1).

92 Piers J. Hale, 'Of Mice and Men: Evolution and the Socialist Utopia. William Morris, H.G. Wells, and George Bernard Shaw', *Journal of the History of Biology,* 43:17 (2010), 17-66 (p. 19).

93 Ovid, *Metamorphoses*, trans. by Anthony S. Kline (University of Virginia) <http://etext.virginia.edu/latin/ovid/trans/Ovhome.htm#askline> [accessed 22 August 2012], Book 8, 'Daedalus and Icarus'. The quotations are from this Kline translation.

Pasiphaë's copulation with a bull which she had been made to love as a punishment by the gods. The gods' punishment inverts Darwin's belief that aristocratic children become more beautiful through selecting beautiful partners. The grotesqueness of her offspring is illustrated in Watts *The Minotaur* (1885, Figure 85), which links the inherited physical consequence of this punishment with moral delinquency indicated by the crushed bird in the Minotaur's hand.

Minos would not allow Daedalus to leave the island and reveal the secret of the maze, so in order to escape Daedalus invented wings for himself and his son. He warned his son not to fly too high or too low but after they had both flown a long distance Icarus, 'drawn by desire for the heavens', flew too close to the sun, the wax used to hold the feathers to his wings melted and he plunged into the sea and drowned. Icarus's 'desire for the heavens' can be seen as hubris or spiritual longing and Leighton shows him as a hero, with a beautiful and powerful body but with an attitude of innocence and naivety. Daedalus is literally a 'cunning worker' who, like Renaissance man, can be seen as a combination of artist and scientist.[94] He is dark-skinned and hunched over while he works on strapping wings onto his beautiful fair-skinned son Icarus.

Little is written about Icarus and his name only appears three times in Ovid's *Metamorphoses,* which is surprising for such a frequently represented mythological figure, but it leaves the artist free to interpret the relationship between the figure and the story. He is often shown as a young boy but Leighton shows him as a classically beautiful grown man. In terms of class, Daedalus is described as an architect and inventor and according to one source Icarus's mother was Naucrate, a Greek slave of King Minos.[95] Leighton suggests by their appearance that Daedalus is working class and that Icarus is a beautiful and aristocratic man who has done no physical labour. We know from the story that Daedalus is inventive but Leighton does not associate his intelligence with physical attractiveness but shows him as hunched over with few conventional signs of beauty.

Leighton presents us with an artificial scene that he has skilfully manipulated to balance the figures and the statue with the landscape. Daedalus and Icarus dominate the landscape and Icarus mimics the posture of the third figure, a statue of Minerva that looks down on the town below. Behind the two figures Icarus's blue cape is blowing in the wind and the outer edge of the cape forms what could be seen as the outline of an ape's skull that mimics Icarus's profile and blank stare into space. The prominence of the enormous drapery suggests that it has some significance other than merely as a backdrop; it was

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[94] Greek Daidalos (*Δαίδαλος*) means 'cunning worker'.

[95] Naucrate is mentioned once in Apollodorus, *The Library Epitome*, trans. by James George Frazer (London: William Heinemann, 1921), E.1.12.

described by *The Times* as 'the one conspicuous defect' and 'deficient in beauty of line, dignity of intention, and truth to nature'.[96] *The Examiner* pointed out that the drapery appears to hang in the sky as there is no wind to support it; suggesting that it had some significance for Leighton, although it appears none of the reviewers saw an ape's skull. The skull might be a conventional *memento mori* or it could symbolize both the ancestry of man and the tragic imminence of death but it could also hint at the irrational 'ape man' that lies behind our reason and energizes the emotions at the heart of the 'ape anxiety' of the 1860s. Icarus's beauty contrasts with the ape skull and signifies the connection between our ape-like precursor and our god-like heroic aspirations. The symbolism of the heroic figure and the cunning worker is similar to the God and Beast mentioned in a draft letter from Charles Lyell to Darwin in which he despairs of the world described by Darwin. He quotes Pope's *An Essay in Man* (1733), 'In doubt to deem himself a God or Beast' and writes that it is no consolation after having been deprived of his soul by Darwin to be told that humans today will be succeeded in 'unbroken lineal descent by angels' who will 'show a Newton as we show an ape.'[97] If Icarus is the next generation of angel then Leighton suggests he is a flawed creation.

Icarus is tall, muscular, fair-skinned, and his raised arm suggests the statue of *Augustus of Prima Porta* although other statues have been suggested as the source.[98] As the weight is on the opposite leg from his raised arm, the stance of *Augustus of Prima Porta* is more firmly based suggesting an emperor commanding his troops. Icarus raises the leg on the same side as his raised arm, which creates an unbalanced stance suggesting weakness and uncertainty. Daedalus is the worker who personifies male creativity and invention and Icarus seems to personify male beauty and power through his link to *Augustus*. Like *Augustus*, Icarus has his left arm raised, cloth draped over his right arm with one leg raised and bare feet and they have a similar appearance with short hair, fine features, a straight nose and prominent chin. The statue of Augustus recalls the fifth-century BCE statue of the *Spear Bearer* or *Doryphorus* by the sculptor Polykleitos.[99] This statue is allegedly an example of his 'canon' and is therefore an example of the perfectly balanced proportions of the human body. It was only identified as the

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96 'Exhibition of the Royal Academy: Third Article', *The Times*, Saturday, 15 May 1869, p. 12.

97 Letter from Charles Lyell to Charles Darwin, 'God or Beast', 2 May 1860.

98 The statue of *Augustus* was discovered on 20 April 1863 in the Villa of Livia, Prima Porta, near Rome. The find was reported in 'From Rome', *The Builder* (13 June, 1863), 428 and is now in the Vatican Museums. Prettejohn points out that 'The figure of Icarus has reminded scholars variously of the Apollo Belvedere, the ancient sculpture group known as Castor and Pollux, Canova's Icarus, and the Praxitelean Hermes', see Elizabeth Prettejohn, 'The Modernism of Frederic Leighton', in *English Art 1860-1914: Modern Artists and Identity*, ed. by David Peters Corbett and Lara Perry (Manchester: Manchester University Press, 2000), pp. 31-48 (p. 33).

99 'In viewing the Augustus from Prima Porta, which obviously recalls the Doryphorus […]', John Pollini, 'The Augustus from Prima Porta and the Transformation of the Polykleitan Heroic Ideal: The Rhetoric of Art', in *Polykleitos, the Doryphorus, and Tradition*, ed. by Warren G. Moon (London: The University of Wisconsin Press, 1995), pp. 262-82 (p. 267).

Doryphorus in 1863.[100] Daedalus, the working scientist, has created a heroic son who takes the form of a god on the brink of ascending into the heavens like an angel. Leighton shows us that humanity has evolved from the ape into a creature capable of transcending earthly restraints and aspiring to the role of gods, and Icarus appears to be the perfect example of manhood, like one of Pope's angels, but he is destined to soar too high.

Leighton breaks the convention of the typical Icarus shown as a slight youth and his father as a wise mentor as in Antonio Canova's *Daedalus and Icarus* (1777-9, Figure 86) or Anthony Van Dyck's *Daedalus Fastening Wings on Icarus* (*c*. 1620, Figure 87). In Leighton's painting, Icarus is higher up the picture frame than his father with a strong classical body and profile, while Daedalus could be a contemporary working man with his dark skin, work-worn face and angular musculature. The bodies however are both carefully delineated against the background; for example, Icarus's right leg has a black outline to differentiate it. This has the effect of isolating the figures from the scene, like a collage, reinforcing their mythological significance. Leighton also creates doubts about Icarus's gender. Icarus's fair, soft skin can be interpreted as the feminine side of Daedalus's hard, angular masculine figure, which mirrors Darwin's distinction between the strong rational man and the soft caring female.[101] Darwin described the greater 'size and strength of man', 'broader shoulders, more developed muscles, rugged outline of body'. Women were described as showing 'greater tenderness and less selfishness'.[102] Questions were raised at the time about Icarus's femininity, for example, *The Times* went as far as to claim that *Icarus* had 'the soft, round contour of a feminine breast' giving him more 'the air of a maiden than a youth'.[103]

Daedalus is not presented as a wise mentor but us a worker while his son is a beautiful and noble young man. Their pose, appearance and skin colour belie their close family link. The difference between Daedalus and Icarus might signify their age difference and their upbringing. Daedalus's skin could have resulted from exposure to the sun and although bent over his body is well proportioned and muscular. Darwin believed that aristocrats are more beautiful than other classes but it is possible Leighton was indicating that beauty can have other causes. Darwin might have been misled by the hubris of aristocracy and noticed a single generation of beautiful women attracted by the wealth of an aristocratic husband. Galton believed that there are inherited class differences and that class can be determined from facial features. He identified 'eight classes of clever

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[100] A. A. Donohue, 'Winckelmann's History of Art and Polyclitus', in *Polykleitos, the Doryphorus, and Tradition*, ed. by Warren G. Moon (London: The University of Wisconsin Press, 1995), pp. 327-56 (p. 327), references Carl Friedrichs, *Der Doryphoros des Polyklet*, Berlin, 1863.

[101] Darwin was not explicit about this distinction until 1871, see next footnote. However, it was a reflection of a commonly held view of the differences between the sexes exemplified by Patmore, *The Angel in the House* (1854).

[102] Darwin, *Descent*, 1st edn (1871), II, pp. 628-29.

[103] 'Exhibition of the Royal Academy: Third Article', *The Times*, Saturday, 15 May 1869, p. 12.

Englishmen—scientists, poets, artists, authors, lawyers, divinity scholars and clergymen, statesmen, servicemen, as well as a miscellaneous category' and he created a further level of discrimination by stating that sixty eight percent lived in southern counties using a demarcation line that also separated 'England's upper and lower classes'.[104] Leighton undermined Galton's ideas by juxtaposing two types that were closely linked genetically and by associating a scientist and artist with the less attractive figure.

In the Victorian period, reason and rationality were prime attributes of masculinity and one of the arguments against women's suffrage was that women were regarded as being unable to make important decisions as they were ruled by emotion. Here Leighton represents the perfect effeminate figure, beautiful in form but guided by emotion rather than reason. His inability to follow instructions and his desire to fly nearer the sun led to his downfall and death. The fragility of the concept of masculinity has been analysed by James Eli Adams in *Dandies and Desert Saints*.[105] By stretching the concept of masculinity, a new identity could be created in order to fashion an acceptable social persona. Social types such as priests and prophets did not conform to all the expected attributes of masculinity and the conventional concept was modified to create appropriate identities that avoided the taint of effeminacy, but Darwin's description of how male and female sexual characteristics evolved undermines these carefully constructed identities.

Daedalus can be understood in modern terms as a combination of artist and scientist. According to Diodorus, he was the first sculptor to separate the legs, extend the arms and open the eyes and he could therefore be said to be the inventor of sculpture.[106] The complex myth of Daedalus gives rise to many possible interpretations of Leighton's painting; it can be seen as illustrating the vanity of beauty or the hubris of science or the dangers associated with the scientific endeavour. Daedalus was not just a skilful craftsman, but an inventor and experimenter who combined the attributes of the artist and the scientist. He was also very protective of his fame and his banishment to Crete was punishment for the murder of his nephew and protégé who was alleged to have invented the saw and the compass.[107] The death of Icarus can be seen to result from Daedalus's over-confidence in technology, and Icarus could therefore represent humanity suffering from the effects of the Industrial Revolution. Many elements suggest Leighton chose a moment when the hubris of men is suddenly realised by Daedalus. It is at this point that the ageing man's cheeks are described as wet with tears and he gives his son a never to be repeated kiss. It is as if he suddenly realised the futility of his inventive mind; he can

[104] Anne Maxwell, *Picture Imperfect: Photography and Eugenics, 1870-1940* (Eastbourne: Sussex Academic Press, 2008), p. 102, 'Map Showing Distribution of Genius in England', 1883-85.
[105] Adams, *Dandies and Desert Saints: Styles of Victorian Masculinity* (1995), pp. 2-3.
[106] Jacob E. Nyenhuis, *Myth and the Creative Process: Michael Ayrton and the Myth of Daedalus* (Detroit: Wayne State University, 2003), p. 25.
[107] Ovid, *Metamorphoses*, trans. by Kline (University of Virginia), Book 8, 'Daedalus and Icarus'.

escape but only at the cost of his son's life. This could symbolize the pointlessness of male ambition in the face of death.

However, there is no single interpretation; Leighton's Daedalus is a disturbing character that is out of keeping with the classical ideal of beauty. His hunched form, dark skin, well-defined musculature, furrowed brow and pixie cap suggest a manual labourer or craftsman of practical rather than intellectual skills. The tradition of a dark-skinned Daedalus and young, fair-skinned and feminised Icarus go back to Joseph-Marie Vien's *Daedalus Attaching Icarus's Wings* (c.1754, Figure 88) and Charles Le Brun's (1619-1690) *Daedalus and Icarus* (1645-6, Figure 89). The myth suggests multiple interpretations of the painting relating to aspiration, creativity, discovery and hubris; for example, Darwin can be seen as represented by Daedalus, informing man, represented by Icarus in the form of an Apollo-like figure, about the dangers that lie ahead represented by the ape skull behind them; or Daedalus could be seen as an artisan modelling a wing from string, feathers and wax, or a scientist experimenting with flight. In either case, his son the young Icarus is the innocent victim of what could be regarded as meddling with nature; or Daedalus could represent all scientists, or all creative people, with his son, whom he has helped to create biologically, opposed to the wings that he has created artificially with the consequential ensuing death; or he could represent the creative and demonic Daedalus who sacrifices his son, not to gain redemption for mankind, but for himself; or Icarus could represent the death of innocence, the inevitable process of growing up, which in this case symbolizes the growth of society in a scientific age with the inevitable death of the old gods. The multiple interpretations could themselves be an aspect of the painting as, whereas a scientist looks for one 'general law' covering many facts, an artist revels in multiple interpretations as they better represent the complexity of our mental lives.

In Peter Brueghel the Elder's *Landscape with the Fall of Icarus* (ca. 1558, Figure 90) the emphasis is on nature, and we see only the legs of Icarus disappearing into the sea as he falls, ignored by the shepherd and the ploughman. In the nineteenth century Daedalus often denoted the classic artist, a skilled craftsman, while Icarus symbolized the romantic artist whose passionate nature and defiance of social conventions resulted in his destruction. Leighton may be reflecting the multiple interpretations present in a complex post-Darwinian world. Another possibility is that Daedalus is a skilled manipulator, a practical scientist like Darwin the problem solver, but one interpretation of the painting is that the solutions found must be correctly applied or we risk losing everything. Icarus becomes a complex figure representing those who benefit from the advances of science but who can be destroyed by them. However, in his lecture Leighton said that it is not the job of art to make any moral points. Art, he said, has a strength that

has no rival, which is to awaken sensations 'directly emotional, and indirectly intellectual which can be communicated only through the sense of sight'.[108]

Darwinian References in the Fleshly School Controversy

Darwin did not publish his complete theory of sexual selection until 24 February 1871, the same year that the Scottish poet Robert Buchanan (1841-1901) criticized what he regarded as Rossetti's and Swinburne's sensual and immoral work in 'The Fleshly School of Poetry' in the October issue of *Contemporary Review*.[109] Buchanan tried to diminish Rossetti's significance by describing his School as being derivative of Tennyson but with 'spasmodic ramifications in the erotic direction'. His disapproval was based on his view that Rossetti thought 'the body is greater than the soul'. He also wrote: 'At times [...] one cannot help wishing that things had remained for ever in the asexual state described in Mr. Darwin's great chapter on Palingenesis. We get very weary of this protracted hankering after a person of the other sex'.[110] This direct reference suggests an awareness of Darwin's theories by the artistic community.

Buchanan's use of the term 'Palingenesis' could be a reference to his friend, Roden Noel's (1834-1889) poem of the same name, through an intentionally misspelt version of Darwin's theory of inheritance, which Darwin called 'pangenesis'. Palingenesis was originally concerned with rebirth, for example, the Pythagorean notion of the rebirth of the soul, whereas pangenesis was Darwin's mechanism for heredity based on what he called gemmules.[111] It is also possible that Buchanan was calling upon Darwin to support his desire for asexual reproduction or parthenogenesis. Parthenogenesis refers to asexual reproduction found in females where growth and development of embryos occurs without fertilization by a male ('virgin birth'). It occurs in some insects, reptiles, fish and very rarely birds and sharks, and is referred to twice by Darwin in the fifth edition of *Origin* (1869). *Descent* was published eight months before Buchanan's article, although Darwin only refers to the trait twice in one paragraph.[112] This reference does not seem to be the 'great chapter' Buchanan mentioned.

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108 Leighton, *Addresses*, 2nd edn (1897), p. 56.

109 Buchanan wrote the review under the pseudonym Maitland, 'The Fleshly School', *Contemporary Review,* 18 (October, 1871), 334-50, see B. and Dobbs, *Dante Gabriel Rossetti: An Alien Victorian* (1977), pp. 180-84. Also, see the useful source of material at <www.robertbuchanan.co.uk> [accessed 22 August 2012].

110 Maitland, 'The Fleshly School', *Contemporary Review,* 18 (October, 1871), 334-50 (p. 343).

111 Pangenesis was described at length in *Variation of Animals and Plants under Domestication*, published in 1868 and Darwin added a substantial section on this theory to his sixth edition of *Origin* in 1872. Although incorrect, a careful reading of the theory of pangenesis does resolve many of the same problems as the genetic theory of inheritance, particularly the idea that every separate atom or unit has the ability to create the complete organism.

112 Darwin, *Descent*, 1st edn (1871), I, p. 314.

Buchanan wrote to Noel on 16 October 1869 mentioning his poem 'Palingenesis', which is about the transience of life and the loss of youth.[113] Palingenesis was a popular seventeenth-century doctrine concerned with man's immortality based on rebirth through fire. It is referred to twice in the Bible with reference to regeneration and renewal, and the early Church applied the term to 'the Christian doctrine of resurrection'.[114] Buchanan, however, specifically refers to Darwin's 'great chapter' which appears to limit it to Chapter 27, 'Provisional Hypothesis of Pangenesis' in *Animals and Plants under Domestication* (1868, Vol. 2, pp. 357-404) which also discusses asexual reproduction at length. It appears therefore that Buchanan may have been confusing, perhaps intentionally, an old pseudo-scientific doctrine of rebirth and immortality with Darwin's theory of heredity. Buchanan's reference to Darwin indicates that he thought his readers would be sufficiently familiar with Darwin's work to understand the terminology, or at least think it relevant.

Rossetti published his response in *The Athenaeum* on 16 December and although he did not repudiate the 'delights of the body' he declared them to be 'naught if not ennobled by the concurrence of the soul'.[115] Swinburne published a response to Buchanan's 'Fleshly School' criticism, *Under the Microscope*, and Buchanan replied with a poem called "The Monkey and the Microscope" in *The Saint Pauls Magazine*.[116] Swinburne started his pamphlet: 'We live in an age when not to be scientific is to be nothing' and equated Buchanan with the 'parasites that leap or creep about the place of rest' which 'a man of truly scientific mind' would not be upset by but would simply examine 'under the microscope'. Buchanan replied by associating Swinburne with a Darwinian monkey rather than an objective scientist. Buchanan's humorous poem starts ironically: 'Once, when the wondrous work was new, │ I deemed Darwinian dreams untrue'. The poem concerns a monkey attempting to copy a scientist by peering through a microscope. Buchanan calls him 'clever monkey!—worth a smile!' and makes fun of his attempts to imitate 'real men' engaged in genuine study. His poem is a clever rejoinder, but lightweight compared to Swinburne's erudite and damning criticism of Buchanan's sycophancy, his attempts to praise his own work anonymously and his poetry 'calculated rather to turn the stomach than to melt the heart.' Other reviewers though are critical of

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[113] Patrick Regan, *Robert Buchanan's Letters to Roden Noel* <http://www.robertbuchanan.co.uk/html/rodennoel.html> [accessed 22 August 2012]. Noel was a poet that John Addington Symonds placed in the same rank as Robert Browning.

[114] Henry Morley, 'Palingenesis', *Fortnightly Review,* 4:22 (1868), 369-78 (p. 371). Palingenesis also had a scientific meaning and was used by Ernst Haeckel to describe the embryonic recapitulations of the characteristics of previous generations.

[115] Rossetti, 'The Stealthy School of Criticism', *The Athenaeum,* 2303 (16 December, 1871), 792-94 (p. 793).

[116] Algernon Charles Swinburne, *Under the Microscope* (London: published as a pamphlet by A.C. Swinburne, 1872) and Robert Buchanan, 'The Monkey and the Microscope', *Saint Pauls Magazine,* 11 (August, 1872), 240.

both Buchanan for criticizing a brother poet and Swinburne for thinking his attack worthy of a reply.[117]

In 1875, during the libel action, which Buchanan brought against *The Examiner,* the poem was quoted against him, particularly the lines:

> That he was dressed in human coat
> And vest, like human, and on th' whole
> Lacked nothing save a soul.[118]

He said that it was not insulting to Swinburne as Swinburne did not believe in a soul and traced his descent from a monkey. He went on to describe Swinburne as a 'materialistic Atheist', suggesting that a belief in Darwin's theories equated with materialism and atheism. Buchanan was deeply religious and strict in his moral stance but he took care when attacking what he considered Darwin's lack of fixed principles.[119] He even called upon Darwin to support his religious views as he claimed that Darwin wrote: 'Science as yet throws no light on the far higher problem of the essence or origin of life.'[120] Buchanan had other links to Darwin; in 1890, he adapted a play called *La Lutte pour la Vie* by M.

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[117] 'The Magazines for October', *The Examiner,* 1:3323 (7 October, 1871), 999-1001 refers indirectly to 'the mud-walks of literature', 'Occasional Notes', *Pall Mall Gazette,* 14:2137 (19 December, 1871), 4 refers to 'this fierce onslaught upon his brethren of the craft', 'News of the Day', *Birmingham Daily Post,* 17:4189 (20 December, 1871) refers to 'a slashing coarse, and in many respects vulgar article', 'Wednesday Morning', *Glasgow Herald,* 1:9975 (20 December, 1871) wrote: 'it is difficult to believe […] one British Poet would assault another', 'Literature', *The Era,* 34:1741 (4 February, 1872), 9 wrote: 'Mr. Buchanan should devote his time to better purpose than abusing more popular bards', 'Literature', *Derby Mercury,* 141:8222 (14 February, 1872), 6 wrote: 'The fault of Mr. Buchanan was that he did not accept the responsibility of his opinions', 'The February Magazines', *The Graphic,* 5:116 (17 February, 1872), 150 wrote: 'Mr. Buchanan deserves sharp rebuke', 'The Reader', *The Graphic,* 5:135 (29 June, 1872), 150 wrote: 'there is to our thinking, more objectionable stuff than in anything we have seen lately' , 'Mr Buchanan's Pamphlet', *The Examiner,* 1:3355 (18 May, 1872), 505 wrote: 'in acknowledgement of his invention of the expression "fleshly poetry" we would recommend him to consider whether there may not be such a thing as "dung-hill criticism."', and 'Mr Swinburne among the Fleas', *The Examiner,* 1:3362 (6 July, 1872), 671 wrote: 'Mr Swinburne gives further proof of his skill in his writing of prose, but will not otherwise enhance his reputation, by this pamphlet'.

[118] 'The 'Examiner' Libel Case', *Pall Mall Gazette* (30 June, 1876), 8-9.

[119] After Darwin died, Buchanan used Darwin's *Autobiography* to try to undermine his credibility. Buchanan argued that the 'special knowledge' of men of genius often means an increase in folly. He went on: 'Even the gentle Darwin, a soul at peace with all men, and wise, surely, in his generation, has told us that the only imaginative delight of his age (when all his splendid faculties still remained intact) was to read trashy novels, that he "hated" Shakespeare, and that to turn to a play of Shakespeare "made him sick!"' He continued by quoting Voltaire, that 'the good folk who have no fixed principles […] are our true philosophers.' Letter from Robert Buchanan to Editor, 'Are Men Born Free and Equal', January and February 1890, *Daily Telegraph*.

[120] Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, 3rd edn (London: John Murray, 1861), p. 514. In fact, Buchanan misquoted Darwin who was arguing that such objections do not invalidate his theory. The full sentence reads: 'It is no valid objection that science as yet throws no light on the far higher problem of the essence or origin of life. Who can explain what is the essence of the attraction of gravity?'

Daudet as *The Struggle for Life.* Many of the references to Darwin were omitted and it was bowdlerised for British audiences.[121]

The *Edinburgh Review* commissioned William Dawkins to review Darwin's *Descent,* and Dawkins criticised Darwin in the same terms that Buchanan used to criticize Rossetti. The article started by accepting that, physically, people are very like animals as they have a similar body structure, are almost identical as embryos and suffer from similar illnesses. However, it went on to quote Mivart as saying that evolution is 'Divine action by and through natural laws' and that humans were suddenly created at one time with 'our intellectual faculty and our moral sense'.[122] Sexual selection was denied as the cause of beauty as it was thought it could not explain how it can 'fill the firmament, and cloth the earth'.[123] Finally, it concluded:

> But we do him [Darwin] no injustice in ascribing to him the theory of Lucretius—that Venus is the creative power of the world […] He appears to see nothing beyond or above it.[124]

Similar questions were being raised by Rossetti and Darwin. When Rossetti wrote:

> Yet, Jenny, looking long at you,
> The woman almost fades from view.
> A cipher of man's changeless sum
> Of lust, past, present, and to come,
> Is left.[125]

He is contrasting the physicality of lust with the spiritual love for the women he spends the night watching, and he suggests that generations of men have regarded woman simply as an object of desire.

The commentators linked Darwin's ideas with those of the artists through a failure of both to take account of the spiritual. In Rossetti's response to Buchanan he said that it 'is an absolute falsehood' to claim he ignored spiritual beauty but he also added that 'in the material conditions absolutely given to man to deal with' he takes a wider view of what is admissible in art.[126] It is the 'material conditions', that is the physical, sensual reality of beauty that he brings into art, which is closely related to Darwin's ideas.

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[121] For example, the first act was cut as it contained a scene in which a young woman emerged from a bedroom with bare shoulders and dishevelled hair.
[122] 'The Descent of Man and Selection in Relation to Sex', *Edinburgh Review,* 134:273 (July, 1871), 195-235 (p. 200).
[123] *ibid*., p. 233.
[124] *ibid*., pp. 234-35.
[125] Dante Gabriel Rossetti, *Poems* (London: F. S. Ellis, 1870), p. 121. An early manuscript of 'Jenny' is dated early to mid-1860.
[126] Rossetti, 'The Stealthy School of Criticism', *The Athenaeum,* 2303 (16 December, 1871), 792-94 (p. 793).

Concluding Remarks

We have seen how the role of women was changing and how Darwin added a different dimension to the argument by pointing out that women must have had a role in selecting their sexual partners in order to explain the male beard. The questions raised by Darwin concerning sexuality and gender roles were also part of a general discussion of what was meant by masculinity and femininity and Leighton's *Golden Hours* added some interesting observations to the debate. Although women had very little freedom to make decisions regarding their own life, the examples of female selective power described by Darwin could be seen as minor but significant as they were exerted, against all the odds, over sufficiently long periods to result in male secondary sexual characteristics.

Rossetti explored many interesting aspects of female agency in *Bocca Baciata*, a painting that illustrates that an 'inner standing point' puts the artist and the viewer in the position of the observed subject. The distinction becomes obscured and the observer becomes the observed highlighting what Rossetti described as a key distinction between science and art. The two forms of observation reflect back to the two types of observation described in Darwin's *Journal* in the previous chapter.

We have also seen that certain cultural beliefs, such as that evolution embodies progress and that human beings are the final achievement of this continual process, were denied by Darwin in his notebooks but implied by him in his writing. Darwin drew some conclusions that appear to have been influenced by the culture at the time, such as the beauty of the aristocracy. Artists, such as Leighton, also raised questions about the ways in which we link class and social role with beauty.

Artists and scientist were responding to the same cultural changes and raising similar questions that in turn helped to change society. The visual image was an important factor for change as it embodies ambiguity but raises questions. Whereas Darwin had to make his case verbally, artists could represent issues in a way that raised questions about cultural paradigms rather than formulate answers. The undermining of established paradigms by raising questions is one of the most powerful forces for change.

Chapter 5: Perfect Beauty

Walter Pater saw the significance of Darwin's writing when he wrote: 'Modern thought is distinguished from ancient by its cultivation of the "relative" spirit in place of the "absolute."'[1] A world created by God is inherently absolute and potentially knowable, and although these views were questioned by philosophers in the seventeenth and eighteenth centuries, the assumption of divine creation is apparent in most scientific writing and art criticism of the early to mid-Victorian period. Darwin's theories and the work of certain artists helped bring about Pater's modern view by undermining the assumption that there is the possibility of perfection and absolute standards.

The German Romantic tradition and the scientific positivism of Auguste Comte (1798-1857) saw science as a search for absolute truth but this was undermined by the essential arbitrariness of Darwin's theory. Notions of the absolute, one source for which goes back to Plato's Theory of Forms, justify a belief in ideal beauty. However, if beauty is entirely arbitrary, as Darwin maintained, then perfect beauty becomes a relative judgement based on local fashions. Darwin described what he meant by 'perfect beauty' in any one group, but he also recognized beauty in abstract properties such as 'rhythm & symmetry', that is in mathematical proportion.[2] However, the beauty Darwin found in mathematical relationships was not metaphysical but practical. Beauty has long been associated with mathematical simplicity, repetition and special ratios such as the golden mean. This is what Darwin called 'beauty in its simplest form' or what I refer to as simple beauty.[3] Sexual beauty and simple beauty may be inter-dependent as we find that secondary sexual characteristics are more beautiful if associated with proportion, symmetry and rhythm. Galton and others found that the average face is more beautiful and recent research has shown that this may be because it is more symmetrical.[4] Darwin also broke with the long tradition of associating beauty with moral goodness.

For Darwin, the ideal type was a common pattern that demonstrated ancestry rather than a Platonic Idea but for many scientists and artists there was a metaphysical

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1 Walter Pater, 'Coleridge's Writings', *Westminster Review,* 29:1 (January, 1866), 106-32 (p. 107), 'it is clearly the work of a man impressed with the *Origin of Species*', *1859: Entering an Age of Crisis*, ed. by Philip Appleman, W. Madden, and M. Wolff (Oxford: Oxford University Press, 1959), p. 82.

2 'Again there is beauty in rhythm & symmetry, of forms', Darwin, *Notebook M*, p. 38, see page 233.

3 Darwin, *Origin*, 6th edn (1872), p. 162.

4 Galton and others noted that facial beauty was increased by combining images photographically. Modern research finds that when groups are asked to choose between faces based on their attractiveness or beauty then, on average, they select faces that have been computationally averaged as more attractive than the faces from which the average has been constructed. Recent research also shows that symmetrical faces are found to be more attractive, possibly because they signify health.

ideal, which they represented as an archetypical skeleton, the symmetrical pattern of a flower or a nude modelled on a Greek canon. However, Darwin and certain artists were questioning the basis of this form of ideal beauty by treating beauty as an inherited and culturally dependent set of characteristics. This way of disassembling beauty into its constituent parts recollects Zeuxis from classical antiquity and Whistler's creation of beauty from the elements he found in nature.[5]

For Darwin, sexual beauty was related to small exaggerations away from what he called the 'common standard', which he regarded as racially and culturally dependent. However, as we are all part of the same species and have common ancestry with all animals, Darwin also thought that we share some aspects of these standards and that these could be regarded as absolute in the sense of being widely or even universally held. The idea of perfect beauty therefore raises many questions concerning the ideal, canons of beauty, universal beauty, and the beauty of symmetry and proportion in mathematics. This wide-ranging subject will be examined from the point of view of Darwin and a small group of artists working during the same period. By examining the ways in which scientists and artists approached such questions, we can uncover common themes that suggest cross currents of influence.

Darwin's theories conflicted with the Platonic idea that there is some form of ultimate reality beyond or behind nature. Plato saw little value in art, saying that as nature is merely the representation of a higher reality, an artist's representation of nature takes us further away from the search for ultimate truth. As Plato wrote: 'The artist, we say, this maker of images, knows nothing of the reality, but only the appearance.'[6] Ideal beauty as an aspect of the Good in Plato's Theory of Forms, was the province of the philosopher. The 'amateurs of the arts and men of action […] delight in beautiful tones and colours and shapes and in all the works of art into which these enter; but they have not the power of thought to behold and to take delight in the nature of Beauty itself.'[7] Aristotle relocated the world of Ideas in the human mind, believing that the artist's imagination is able to create forms that can then be used to shape matter to create figures not found in nature.[8]

Our common ancestry implies there could be some universal elements to beauty, such as our hairless skins, but the wide variety of racial differences indicates there is no

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5 The Zeuxis myth concerns the creation of beauty from the selection of characteristics from different women, Elizabeth Mansfield, *Too Beautiful to Picture: Zeuxis, Myth, and Mimetics* (Minneapolis, MN: University of Minnesota Press, 2007), pp. 119-20. As mentioned earlier, Whistler explained how 'Nature contains the elements of color and form of all pictures – as the keyboard contains the notes of all music', Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus), para. 40.

6 Plato, *The Republic of Plato*, trans. by Francis MacDonald Cornford (Oxford: Oxford University Press, 1945), p. 331.

7 *ibid*., p. 183.

8 Panofsky, *Idea* (1968), p. 17.

single canon of beauty. However, many artists and critics in England continued to regard classical beauty, as exemplified by Greek sculpture, as the closest art has come to a universal standard of perfection. In the nineteenth century, many thought that the Greeks had discovered the rules of ideal beauty, and classical sculptures, such as the *Venus de'Medici* and later the *Venus de Milo*, were exemplars.[9] Although classical beauty was culturally accepted as a universal standard, it was recognized as conflicting with contemporary ideas of beauty as is shown by a *Punch* cartoon of 1871 in which a group of fashionable women are finding fault with the *Venus de Milo*.[10] It was believed that the ancient Greeks had developed a canon of beauty based on a set of mathematical rules regarding the ratios and proportions shared by beautiful objects. One designer, David Ramsay Hay, set out to rediscover these rules so that they could be incorporated within art training. Hay's *Science of Beauty* influenced the training courses given at the Government Schools of Design, and it formed a bridge between science and art.

These ideas, of mathematical rules of beauty and abstract patterns in nature, appear to have influenced some artists, such as Albert Moore, whose approach to ideal beauty combined classical forms with a formal approach to the process of artistic production. Moore used a formal approach to create works of 'decorative' beauty that combined elements of classical beauty with plant designs within a rigid design matrix. Moore's *A Venus* brings together many of these ideas and exhibits a number of interesting anomalies, such as elements of the male body, a high waist-to-hip ratio for the fashion at the time and a standardised face. This all suggests he was combining masculine and feminine beauty with decorative elements within a formal grid. Although Darwin related perfect beauty to the average and the sexual and Moore based it on the classical and the androgynous, there were many points of contact between their approaches.

The Perfect Flower

The design reform movement found beauty in the underlying forms of nature, and this interest can be linked historically to Richard Owen's archetypes and Goethe's archetypical plant (*Die Urpflanze*). These ideas were vigorously opposed by John Ruskin

[9] The notion of exemplars as the examples shared by students during their training and which then form the basis of their thinking was developed by Kuhn in the postscript to the second edition of Kuhn, *The Structure of Scientific Revolutions* (1970), p. 187. Kuhn suggested the idea of exemplars to explain aspects of the way in which scientists work within shared paradigms but they also apply to other fields, such as art and art history; Gombrich's schemata correspond to Kuhn's exemplars, Gombrich, *Art and Illusion*, 6th edn (2002, first published 1960), p. 248.

[10] George Du Maurier, *Punch's Almanack for 1870*, (Figure 81), p. xi. 'The Venus of Milo; or, Girls of Two Different Periods. Chorus: "Look at her big foot! Oh, what a waist!—and what a ridiculous little head!—and no chignon! She's no lady! Oh, what a fright!"' The chignon is a hairstyle in which long hair was pulled up and pinned onto the back of the head, sometimes with ringlets descending. The *Venus* has her hair pulled up although in a slightly different manner illustrating the fickleness of fashion.

who believed that the student should be taught to represent nature accurately as he believed it was divinely created and held deep symbolic meaning. Darwin's ideas conflicted with both Ruskin's and those of the design reform movement, and to understand his position more clearly the background and influence of the design reform movement and Owen's archetypes need to be described.

The creation of the Schools of Design in 1837 led to a highly structured curriculum that included the teaching of designs that exhibited linear simplicity, flatness and close repeat, and by the 1840s this approach was formalized in books such as William Dyce's *The Drawing Book of the Government Schools of Design* (1842-43, Figure 91). This design approach was particularly well suited to certain types of industrial decorative design, such as for mass-produced wallpaper and fabric, and it conformed to the requirements of new printing machines that repeated a pattern across a surface. Mechanical limitations demanded a simplification of drawing and the removal of shading, and small dies encouraged minute patterns of floral and geometric effects.

The theoretical precursor of the design reform movement is typically traced back to Goethe, one of the founders of morphology, the study of form in nature.[11] He studied plants and believed that the leaf, or *Urpflanze*, is the basic structure from which all other plant forms are derived. These underlying forms were a powerful influence on the design reform movement and on scientists such as Richard Owen. In 1849, Richard Redgrave (1804-1888) gave lectures on the importance of the study of botany to the ornamentalist. Botany provided decorative exemplars but it was also important because of the 'fitness of purpose' of plants.[12] Redgrave maintained that artists should express nature by studying not its outward form, as Ruskin argued, but 'if he seeks out the mode of development of vegetable growth, he will find that regularity and symmetry are the normal laws, while all that is irregular is accidental and extraneous' and he concluded: 'nature is developed in strict geometrical and numerical rhythm'.[13] Redgrave also recommended returning to nature as a model: 'if the Greeks avowed that nature, as in the honeysuckle and ammonite, was their model, we may well return to such a source'.[14] Despite severe criticism from Ruskin, in 1852 Richard Redgrave drew up a detailed curriculum that was imposed on the regional schools until at least the end of the century. It provided a

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11 Keyser, 'Ornament as Idea', *Journal of Design History,* 11:2 (1998), 127-44 (p. 129).

12 Frayling, *The Royal College of Art* (1987), p. 38.

13 *Manual of Design, Compiled from the Writings and Addresses of Richard Redgrave, Ra*, ed. by G. R. Redgrave (London: Chapman and Hall, 1890), pp. 18-27.

14 F. M. Redgrave, *Richard Redgrave, C.B., R.A., A Memoir, Compiled from His Diary* (London: Cassell, 1891), pp. 361-62. Redgrave and Owen were interested in embryology and recapitulation theory was thought to give an insight into the phylogeny of species but Owen argued against the simplistic view that 'ontogeny recapitulates phylogeny', that is, that the stages an embryo goes through to become an adult repeat the stages in the evolution of its remote ancestors.

standard system that enabled universal examinations and competition and, for example, individual works of art to be specified nationwide for each particular stage. Figure drawing was included in the curriculum and design was taught as a language with a grammar, syntax and usage. Redgrave and Dyce gave lectures deprecating the over-elaborate designs that were being used at the time for curtains, wallpapers and carpets, in favour of linear and geometric patterns.[15] Barbara Keyser argues that the Schools' theoretical basis was transcendental anatomy, which treated the laws of nature 'as the thoughts of God and likewise as eternal principles of beauty', but this she argues was later 'destroyed by Darwinism'.[16] The leading exponent of transcendental anatomy was Richard Owen, student of Joseph Henry Green. Owen's ideas dominated natural history in London between 1825 and 1860.[17]

Owen was an influential early supporter of the idea that behind a group of common but diverse skeletons, such as those of the vertebrates, lay an idealised proto-skeleton, which he called an archetype. Archetypes are models for the allowed forms of species and in his 1848 book *On the Archetype and Homologies of the Vertebrate Skeleton* he proposed an archetypical vertebra that he believed was the original source of all the varieties of vertebrae (Figure 93).[18] He described this 'as answering to the *ιδέα* of Plato, deemed by that philosopher to be superadded to matter and mind, and which he defined as a sort of model, or mould in which matter is cast, and which regularly produce the same number and diversity of species'.[19] Owen spent twenty years examining vertebrate bones and produced a generalized skeleton that represented the archetypical vertebrate (Figure 94). He did not describe this, like Darwin, as a process that took place over time but as 'one of the most beautiful and marvellous instances of the harmony and simplicity of means by which the One Great Cause of all organization has effected every requisite arrangement under every variety of development'.[20] In other words, he looked through the diversity of nature and found a common underlying form that represented its common structure, which he interpreted as the divine idea behind the diversity. Owen adopted the motto 'The One in the Manifold' to express his concept of how each individual is an example of an idea in the divine mind, and his earlier theories fed into the general revival of interest in Platonist philosophy during the 1850s and 1860s, which in

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15 Frayling, *The Royal College of Art* (1987), p. 42.

16 Keyser, 'Ornament as Idea', *Journal of Design History,* 11:2 (1998), 127-44 (pp. 127-28). Her conclusion deprecated the influence of Darwin as she believed it had resulted in the replacement of ornament by the 'spare' and 'sterile' visual art of the twentieth century.

17 Richard Owen, *On the Archetype and Homologies of the Vertebrate Skeleton* (London: John van Voorst, 1848) and Brett, 'Design Reform and the Laws of Nature', *Design Issues,* 11 (1995), 37-49.

18 Owen, *On the Archetype* (1848), p. 175.

19 *ibid*., p. 172.

20 *ibid*., p. 148.

turn influenced the work of the design reform movement.[21] In a letter to his sister explaining why he had adopted his archetype skeleton as his crest, Owen wrote: 'It represents the archetype, or primal pattern—what Plato would have called the "Divine Idea"'.[22] Owen's archetypes can be regarded as analogous to the idealised object in art. Joseph Green, for example, described Owen's archetype as 'an artist's mental ideal, embodying the highest, most perfect development of, for example, the female form'.[23]

At one stage, Owen tentatively associated these archetypes with an evolutionary process but following his criticism of Darwin's theory, he described them as divinely inspired.[24] Like many other scientists, Owen thought that species were created according to a divine creative plan rather than through ad-hoc divine interventions, with the exception of man who was thought to have been specifically divinely created. Although they accepted that plants and animals could change, as evidenced by breeding, they did not accept that this would ever create a new species. Although Darwin's *Origin* conflicted with Owen's ideas of transcendental anatomy, the influence of his neoplatonic idealism continued through the nineteenth century particularly as a theoretical underpinning for the abstract patterns of the design reform movement.[25]

The design reform movement was a group of influential designers who took their inspiration from nature, and through the Government Schools of Design spread their message to a wide range of other artists. Artists like Dresser approached their work scientifically as they saw an underlying symmetry within the complexity of the natural world. Dresser, like Darwin, set out to discover the unity within the overwhelming complexity of nature. However, they took different approaches. Dresser was a botanist and an artist who unified the ideas of the Design School. He gave lectures in London on botanical drawing in 1852, which were influenced by well-known figures in the Design School, such as Redgrave, John Lindley (1799-1865) and Owen Jones (1809-1874). Seven years later Dresser was awarded an honorary doctorate from the University of Jena for his botanical work and his ability as an artist enabled him to create a link between the science and art based on the mathematical analysis of form. Dresser wrote that 'the basis of all form is geometry' and this mathematical approach underpinned the

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21 Nicholas A. Rupke, 'Richard Owen's Vertebrate Archetype', *Isis,* 84:2 (June, 1993), 231-51 (p. 248).

22 Letter from Richard Owen to his sister Maria Owen, 7 Nov 1852, quoted in *ibid*., p. 245. Owen's contemporaries did point out that his archetype did not exactly match the concept of a Platonic idea as it was the simplest model of a vertebrate rather than the most complete.

23 *ibid*., p. 246.

24 Owen worked closely with Darwin on the analysis of his South American fossils and described the 'unity which pervades the diversity' of skeletons as diverse as humans and fish, Owen, *On the Archetype* (1848), p. 164. However, he never accepted transmutation as the mechanism and proposed a type of divine force.

25 The debate concerning the nature of evolution was more complex and involved many more scientists, for example, well-known figures such as Louis Agassiz (1807-1873) and William Whewell (1794-1866) broadly supported Owen's views.

formal symmetry of the design reform movement.[26] Darwin, however, generalised the detail of nature to create general laws. Both approaches involved abstraction and generalization from nature.

The design reform movement considered the then popular three-dimensional and brightly coloured representations of flowers, plants and natural scenes to be in bad taste. The reason they gave was that it was inappropriate to try to represent a three-dimensional object, such as a bunch of flowers, on a two-dimensional surface, such as a carpet or wallpaper. Some went further and suggested that the dishonesty of representing three dimensions in two made it almost immoral.[27] These bright, naturalistic carpets, curtains and fabrics were parodied in novels and associated with a new purchasing public who, it was believed, had no taste and bought cheaply made industrial goods. In 1878, Lucy Orrinsmith described how in many drawing rooms everything had an 'unfitness for the fulfilment of any function' with an 'unfeeling' mantelpiece, 'hard curtains' at the window and how 'on the carpet vegetables are driven to a frenzy in their desire to be ornamental.'[28] Charles Eastlake warned that a carpet 'may kill by its colour' and it was believed that their popularity was a result of 'uneducated consumers swayed by novelty'.[29] Purchasing decisions for the home were made by women and there was a concern that women were not able to make responsible decisions but were swayed by the emotional appeal of the bright colours. The design reform movement was seeking timeless and unchanging designs that they believed went beyond fashion. Consumption was seen to re-enact competition in nature, the struggle for life, and the survival of the fittest, and fashions were seen as the driving forces behind capitalism.

The design reform movement can be seen as the precursor of modern design with its dislike of excessive ornamentation, its rejection of three-dimensional representation and its focus on function following form. It created a fixed, eternal vision of the world, but Darwin's ideas were opposed to this as he emphasized the fluidity of species and the regional variations in beauty. Darwin's laws create a structure that brings all observations under control and explains them, but the facts observed are fickle, reckless and idiosyncratic. Darwin's text often re-enacts this as it flits from one part of a

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[26] Frayling, *The Royal College of Art* (1987), p. 38, Dresser wrote the quotation in his personal copy of Jones's *The Grammar of Ornament*.

[27] The association with immorality sometimes borders on the humorous. Dickens has a school inspector, brought in by Gradgrind, castigate a pupil for liking flowers on a carpet with the words: 'you cannot be allowed to walk upon flowers in carpets […] you must not have quadrupeds represented upon walls […] This is fact. This is taste.' Charles Dickens, *Hard Times* (London: Bradbury & Evans, 1854), p. 10.

[28] Logan, *The Victorian Parlour* (2001), p. 2 quoting Lucy Orrinsmith, *The Drawing-Room: Its Decorations and Furniture* (London: Macmillan, 1878), pp. 1-2.

[29] Logan, *The Victorian Parlour* (2001), p. 82. He also wrote: ''By the mid-1850s, a consensus had been reached among the major figures participating in the discourse of design that a mimetic treatment of nature, though admittedly popular, was a serious error in taste, no matter how skilfully executed.' *ibid*., p. 51.

plant or animal to another, for example, from skulls to crab jaws, from legs to stamens and pistils, and from flowers to leaves all in a single sentence.[30] He presents a world of detailed images, each one precisely delineated and clearly presented. There were also close connections between Darwin's work and design reform as both had a materialistic approach that interpreted nature in terms of its formal structures. This connection between plant forms and formal design was later known as 'art botany'.[31]

Leaves and Flowers from Nature No. 8

Dresser was one of the leading designers of the nineteenth century and his illustrations highlight the approach of the design reform movement. I have selected the same illustration used by Eisenman to show the shared symmetry that is 'evidence of the "unity of type" of different organisms.'[32] I use the illustration to show that Dresser was interested in the underlying form. He wrote: 'We are not to draw particular plants as they really exist—blown about and deformed, but as we know them to be'.[33]

Dresser was a child prodigy and began attending the Government School of Design when he was thirteen. He gave his first lectures on botanical drawing in 1852, became Professor of Artistic Botany in 1855, wrote a series of articles in the *Art Journal* in 1857, sold his first designs in 1858 and was awarded an honorary doctorate in 1859. He was a colleague of Joseph Hooker, then associate Director of the Royal Botanic Gardens, Kew and a close friend of Darwin.[34] Dresser's first book on 'art botany' was *Unity in Variety as Deduced from the Vegetable Kingdom* (1859) where he argued that there is a unity between all plants and 'the rudimentary condition of one plant may be considered as the ultimate condition of another.'[35] Dresser's mentor at the School of Design was Owen Jones and Dresser submitted a page of 'Leaves and Flowers from Nature No. 8' for Jones's *The Grammar of Ornament* (1856, Figure 10).

Dresser's illustration is crowded with plant forms that are regimented across and down the page, carefully separated from each other and formal in their symmetrical

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30 'Naturalists frequently speak of the skull as formed of metamorphosed vertebræ: the jaws of crabs as metamorphosed legs; the stamens and pistils of flowers as metamorphosed leaves', Darwin, *Origin*, 1st edn (1859), p. 438.

31 'Art botany' is a term that became associated in the twentieth century with a movement linked to Christopher Dresser and the creation of ornamentation out of stylized plant forms as described in Christopher Dresser, *Unity in Variety: As Deduced from the Animal Kingdom* (London: James S. Virtue, 1859). Dresser does not use the term 'art botany' but as Professor of Botany at the South Kensington Museum, he was able to create stylized designs from accurate botanical illustrations.

32 Eisenman, *Design in the Age of Darwin* (2008), pp. 18-19.

33 David Brett, *Rethinking Decoration: Pleasure & Ideology in the Visual Arts* (Cambridge: Cambridge University Press, 2005), p. 110.

34 Eisenman, *Design in the Age of Darwin* (2008), p. 17.

35 Dresser, *Unity in Variety* (1859), p. 9.

rigour. The daffodil has its petals lined up vertically mirroring the white lily below it like two abstract patterns waiting to be repeated across wallpaper or fabric. The plan of the clarkia at the bottom of the page shows floral symmetry moving to the point of abstraction. Dresser was abstracting the underlying symmetry he found in nature based on his scientific study of botany. His early design work was based on formal structures within plants that he uncovered during his scientific analysis, and his later ceramic work incorporated biological forms.[36] Darwin described nature in terms of an 'entangled bank' but Dresser formulated a proposition that began 'the productions of nature belonging to the vegetable kingdom are symmetrical in their parts'.[37] Dresser went on to explain the apparent lack of symmetry in nature as resulting from 'external influences' such as light, other plants, disease and damage. Both scientists were looking for general laws within the complexity of nature and Darwin found them in the rules governing descent where the evidence lies in the idiosyncrasies of individual variations. Dresser found a visual simplicity in the symmetry of the forms. Darwin's approach can be associated culturally with the importance of the individual in a complex world of change and Dresser's in the underlying stability of natural forms that the Greek's observed.

Dresser crowds the page with forms but each flower is constrained within its own lined box. Dresser treads a fine line between accuracy and idealization. Each flower is recognizable and exhibits the particular forms of that species and variety but each shape is organised into geometric perfection. Flowers stand to attention and their petals form symmetric patterns like a diagram of an architectural feature rather than a botanical illustration. While staying true to the form of each species Dresser's flowers create stylized patterns that could be copied by students learning to draw abstract shapes that would be repeated across two-dimensional surfaces. The colours are predominantly the yellows, whites and blues of spring with a deep red in the top right. Each flower is complemented by its leaf shape shown as a pattern. The iris leaf, for example, is flattened out behind the flower and its pointed tip aligns exactly with the base of the honeysuckle stem.

The flowers are described on the last page of Jones's book as 'various flowers in plan and elevation' and this terminology refers back to Proposition 1: 'The Decorative Arts arise from, and should properly be attendant upon, Architecture.'[38] Dresser believed that ornament was not an embellishment on architecture but the creative force that drove architecture forward. The book reviews designs taken from nature across many civilizations and cultures and concludes that copying is a symptom of decline: 'True art

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36 Whiteway, *Christopher Dresser: A Design Revolution* (2004).

37 Christopher Dresser, 'Botany, as Adapted to the Arts and Art-Manufacturer: Part 1', *Art Journal,* 19 (1857), 17-19 (p. 19).

38 Jones, *The Grammar of Ornament* (1856), p. 157 and Plate 98 (p. 189).

consisting in idealizing, and not copying, the forms of nature […] and that the more closely nature is copied, the farther we are removed from producing a work of art.'[39] This was directly opposed to Ruskin's views. Ruskin wrote: 'this substitution of obedience to mathematical law for sympathy with observed life, is the first characteristic of the hopeless work of all ages.'[40] The tension between the complexity of naturalism and the simplicity of abstraction can be seen in Darwin's work and his use of metaphors such as 'a hundred thousand wedges' and the 'entangled bank'.[41] The point Darwin was making was that underlying the complexity of nature's entangled bank with its 'endless forms most beautiful' were simple laws 'acting around us'. Dresser's flower designs also reflected the beauty of simplified designs extracted from the complexity of natural forms but based on an underlying mathematical symmetry that refers back to classical antiquity.

The perfect flower is an abstraction that is created by looking for the general within the particular and by systematizing the abstraction within a mathematical framework. Darwin also abstracts from the physical but in order to define a process that explains the particular. Both use the original plant as their source material but Dresser abstracts away from the detail and Darwin uses the particular as the primary evidence for his ideas. It is the particularness of the plant that provides Darwin with his justification but for Dresser it is irrelevant. Darwin's ideas are therefore concerned with the specific and the idiosyncratic and therefore can be linked to social changes that value the individual.

Darwin and the Perfect Human Body

Darwin stated in his paragraph on the perfect human body:

> No doubt the perceptive powers of man and the lower animals are so constituted that brilliant colours and certain forms, as well as harmonious and rhythmical sounds, give pleasure and are called beautiful; but why this should be so, we know no more than why certain bodily sensations are agreeable and others disagreeable.[42]

Darwin does not suggest why we should be 'so constituted' but this question is the subject of Grant Allen's book *Physiological Aesthetics* (1877).[43] Darwin continued:

> It is certainly not true that there is in the mind of man any universal standard of beauty with respect to the human body. It is, however, possible that certain tastes may in the course of time become inherited, though I know of no evidence in favour of this belief; and if so, each race would possess its own innate ideal standard of beauty. […] The men of each race prefer what they are accustomed to behold; they cannot endure any great change; but they like variety, and admire each characteristic point carried to a moderate extreme. Men accustomed to a

39 *ibid*., p. 154.
40 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XVI, p. 274, 'The Two Paths'.
41 See Appendix 1, page 231 (*Notebook D*, 1838), 135e and page 247 (*Origin*, 1859), 489-90.
42 Darwin, *Descent*, 1st edn (1871), II, p. 353.
43 'My object is to exhibit the purely physical origin of the sense of beauty', Allen, *Physiological Aesthetics* (1877), p. 2.

> nearly oval face, to straight and regular features, and to bright colours, admire, as we Europeans know, these points when strongly developed. On the other hand, men accustomed to a broad face, with high cheek-bones, a depressed nose, and a black skin, admire these points strongly developed.[44]

Darwin compressed many aesthetic ideas into this short section describing what he considered a 'perfect beauty'. He rejected the idea of a 'universal standard of beauty' meaning an inherited common standard across all races, although he later describes sexual characteristics, such as our hairless bodies, which could be described in this way. There have been other characteristics suggested as universal standards. One recent hypothesis is that a narrow waist is a cross-cultural sign of beauty and a candidate for a universal characteristic.[45] Darwin's comment that he knows of no evidence for tastes being inherited is difficult to interpret as only eight pages previously he had described the preference for large posteriors among men of the Khoikhoi race. Four pages previously he wrote: 'we thus see how widely the different races of man differ in their taste for the beautiful.'[46] He may be making the specific point that he knows of no examples of any universal standard of beauty or ideal beauty being inherited. Particular favoured characteristics can be inherited and appreciated but he rejects the idea of any ideal beauty, not even one that is racially specific. .

His rejection of universal beauty appears to conflict with his theory of sexual selection, which does not rule out the possibility. It is likely that what he is rejecting is the notion of some absolute, metaphysical form of beauty that is independent of sexual selection. This interpretation is reinforced by his example of the different views of beauty in different cultures. He gives equal weight to the beauty of an oval European face compared to the beauty of 'a depressed nose, and a black skin'. This implies that he disagreed with the common belief at this time that classical Greek sculpture represented a form of ideal beauty. He continued:

> No doubt characters of all kinds may easily be too much developed for beauty. Hence a perfect beauty, which implies many characters modified in a particular manner, will in every race be a prodigy. As the great anatomist Bichat long ago said, if every one were cast in the same mould, there would be no such thing as beauty. If all our women were to become as beautiful as the Venus de Medici, we should for a time be charmed; but we should soon wish for variety; and as soon as we had obtained variety, we should wish to see certain characters in our women a little exaggerated beyond the then existing common standard.[47]

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44 Darwin, *Descent*, 1st edn (1871), II, pp. 353-54, see page 273.

45 Singh, Renn, and Singh, 'Exploring the Health and Beauty Link', *Proceedings of the Royal Society B: Biological Sciences,* 274:1611 (2007), 891-94 (p. 894). The researchers found over 7,000 references in the Literature Online database concerning beautiful body parts. The breast, waist and thighs are referred to as beautiful more often than any other body part. All sixty-six references to the waist described it as narrow. 'Breast' had the most references (219) but only one described large breasts as beautiful. There were fifteen references to 'plump' women and four to 'slim' but none to an enlarged waist.

46 Darwin, *Descent*, 1st edn (1871), II, p. 350, see page 272.

47 *ibid*., p. 354, see page 273.

That is, ‘perfect beauty’, with respect to each race, is an exception, that is exemplified in an atypical person, or what he calls a ‘prodigy’. The reason he gave is that if all women were as beautiful as the ‘Venus de Medici’ then a desire for variety would lead to some characteristics becoming exaggerated. Darwin does not speculate further on this need for variety but presents it as the motivation for the selection of ‘a little exaggeration’ when presented with uniform beauty. If this desire for difference is the driving force behind sexual selection then one would expect to see a wide variety in the forms of beauty.

Darwin gives the *Venus de’Medici* (Figure 95) as an example of perfect beauty, which he is presenting as a culturally recognized standard of ideal beauty so that he can demonstrate why, in his view, this is a misunderstanding as it would not continue over many generations. In modern terms, he was saying that if a significant population evolved to recognize a particular set of characteristics as optimal then this would be unstable. A ‘beauty war’ would arise in which a characteristic would be preferred by a significant group of the opposite sex and the characteristic and its appreciation would be passed on to the offspring. By 1871, the *Venus de Milo* (Figure 96) was regarded as the epitome of beauty rather than the *Venus de’Medici,* but Darwin may have been referencing what was regarded as the most beautiful female form when he last took an interest in art in the late 1820s and 1830s.[48]

Within aesthetic theory, terms such as ‘ideal beauty’ have a long complex history, and so to clarify further discussion I use the term ‘perfect beauty’ when referring to Darwin’s view that there are a few people regarded as extremely beautiful because of their particular combination of characteristics in one race at a particular time.[49] The appreciation of perfect beauty can be influenced by other cultures and temporary fashions but there is no reason why there should not be elements of perfect beauty that remain constant for thousands of years. Ideal beauty I use in the sense in which it was discussed by Erwin Panofsky in *Idea: A Concept in Art History* (1968), that is as a complex art historical term with no simple definition but with a long history. A universal characteristic of beauty is a sexual characteristic that is regarded by most people as beautiful. As there is a tendency to seek variety and as beauty is what is perceived to be beautiful by an individual it is statistically unlikely that a group would agree on a set of

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[48] Haskell and Penny, *Taste and the Antique: The Lure of Classical Sculpture, 1500-1900* (1981), pp. 325-30. A comparison of the statues in 1865 described the *Venus de’Medici* as ‘coquettish’ and the *Venus de Milo* as ‘of the loftiest character […] unequalled by any other remaining female statue of the ancients yet discovered’, 'The Language of Art', *St. James's Magazine,* 12 (March, 1865), 440-48 (p. 444).

[49] Darwin does not use the term ‘ideal beauty’ although he wrote in one of notebooks, ‘But what is beauty?— it is an ideal standard, by which real objects are judged: & how obtained— implanted in our bosoms— how comes it there?’, Charles Darwin, *Old & Useless Notes About the Moral Sense & Some Metaphysical Points* <http://darwin-online.org.uk/content/frameset?viewtype=text&itemID=CUL-DAR91.4-55&pageseq=1> [accessed 22 August 2012], p. 22.

universal characteristics of beauty although an average face or body shape might score high as it would come closest to the set of preferred sexual characteristics for the most people.

The ideal type can also be understood in terms of shared structures of different plants and animals, and this was discussed in the previous section. Darwin described the ideal type when he wrote: 'no group of organic beings can be well understood until their homologies are made out; that is, until the general pattern, or, as it is often called, the ideal type, of the several members of the group is intelligible.'[50] However, he was not talking about a metaphysical idea or archetype in the mind of God. He wrote: 'the science of Homology clears away the mist from such terms as the scheme of nature, ideal types, archetypal patterns or ideas, &c.; for these terms come to express real facts.'[51] For Darwin, therefore the ideal type was a set of identifiable common features that could be explained by their common ancestry.[52]

The Perfect Nude

In the 1860s, the publication of Darwin's *Origin* undermined the idea that human beings had been created in God's image and replaced it with an evolutionary descent from ape-like creatures involving arbitrary but selected changes to their body shape over time. This removed one source of perfection, divine creation, but an alternative basis had been proposed by the ancient Greeks who thought that ideal forms, including the ideal nude, resided in a metaphysical world to which the philosopher had access.

John Addington Symonds, Snr. (1807-1871) wrote that there are many theories of ideal beauty and these include those writers who believe it is achieved by compiling an aggregate of individual parts judged as the most beautiful, those that believe that it is 'derived from the most perfect specimens of the actual' and those that believe that it involves heightening those features that express the nobler qualities of human beings.[53] Symonds went on to argue that ideal beauty should be regarded as what is created by the artist from their artistic imagination. In a Darwinian world of relative and contingent forms, the ideal nude is replaced by practical alternatives such as a racially dependent 'beauty parade' of possible models, the artistic selection of preferred body parts or the airbrushing out of blemishes and the exaggeration of fashionable features. An artist

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50 Charles Darwin, *On the Various Contrivances by Which British and Foreign Orchids Are Fertilised by Insects, and on the Good Effects of Intercrossing* (London: John Murray, 1862), p. 286.

51 *ibid*., p. 288.

52 We now know that similar features, such as the eye, can evolve independently and so similar features suggest but do not imply common ancestry.

53 John Addington Symonds, *Miscellanies* (London: Macmillan, 1871), pp. 39-40, a collection of papers published by his son John Addington Symonds (1840-1893).

operating within the Christian tradition had an additional practical problem painting the perfect nude, that is, one that is beautiful, without imperfections and is beyond criticism, because of the association of the naked body with shame and sexual desire.

Perfect beauty is like fashion in that both arise from shared but arbitrary choices but in one case these are made over many generations and in the other over a few months or years. The contrast between perfect beauty and fashion is illustrated by the difference between Albert Moore's classical figures and Tissot's contemporary figures. Moore is representing the attributes recognised as beautiful by Western European culture and Tissot is showing the male and female forms regarded as fashionable and beautiful in Victorian England. Perfect beauty at any one time is the frozen embodiment of thousands of independently arbitrary but consistent decisions through hundreds or thousands of generations. Moore appears to have searched for those elements that have remained constant over thousands of years by referring to classical statues. He further generalizes his representation of perfect beauty by combining features from different exemplars to create a type of ideal beauty, although one that is still embedded within Western European norms of beauty.

Another way to create perfect beauty, mentioned by Symonds, involves compiling an aggregate of parts and this could be seen as a type of averaging process if it includes merging a mixture of forms. It is generally agreed that the attractiveness of the averaged face was first noted by Galton when he was trying to determine facial types by superimposing photographic images (Figure 97). Galton developed a technique of composite photography that he used to average out particularities of facial appearance in order to identify and then categorize types of disease, social class and criminals and he noticed that the faces looked more attractive.[54] Modern research uses more sophisticated 'morphing' techniques that create an average by moving facial components rather than simply overlaying images (Figure 98).[55] Recent experiments that involve rating faces for degree of attractiveness or beauty (the terms are used interchangeably in the literature) suggest that the highest score is obtained by the average and the symmetrical.[56] An average face is also more symmetrical, which has been used to suggest that what we are

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54 '[…] the coarse and low types of face found among the criminal classes.', Francis Galton, *Inquiries into Human Faculty and Its Development* (London: Macmillan, 1883), p. 10. 'It is, indeed, most notable how beautiful all composites are', *ibid*., p. 240.

55 The photographs were taken by Mike Mike (born 1964) for his 'The Face of Tomorrow' project. The aim of the project is to assess the effects of globalization on identity by taking photographs of the people, of all nationalities, found in cities around the world and morphing them into a single image for each sex. The images shown were taken in London on 24 February 2004. His website <http://www.faceoftomorrow.com> [accessed 22 August 2012] shows the average face for twenty-two cities.

56 There are thousands of papers published about the evolutionary aspects of beauty and attractiveness, such as Komori, Kawamura, and Ishihara, 'Averageness or Symmetry: Which Is More Important for Facial Attractiveness?', *Acta Psychologica,* 131:2 (2009), 136-42.

responding to is a sign of a healthy potential mate with a good genetic profile.[57] Modern research generally regards attractiveness as a scalar measure at the high end of which we would use the word 'beautiful'. However, some research indicates there is a type of beauty, described as that possessed by highly attractive models (HAMs), which we react to differently from the beauty of normally attractive models (NAMs).[58]

Some experiments and theoretical arguments suggest that adult faces are more attractive if they contain certain exaggerated features, such as 'large eyes, cheekbones, and chins'.[59] Other research indicates that there is 'high cross-cultural agreement in attractiveness rating of faces of different ethnicities' and that babies as young as two months prefer to look at more attractive faces as previously rated by adults.[60] Despite Eisenthal's claims, other recent research has found the average face of each race is preferred by people of the same race although the widespread promotion of Western standards has made it difficult to measure unbiased racial differences.[61] Research has also found that smooth skin is found attractive and that if skin is artificially smoothed by computer it is found to be even more attractive.[62] This may be because our culture has trained us to expect airbrushed faces but it is interesting that nineteenth-century painters often painted flawless, plastic skin. Research has found a strong correlation between a smooth skin texture, as found in many nineteenth-century painted nudes, and attractiveness.[63] Symons also points out that smooth skin is a marker for health and fecundity, particularly an absence of lesions and eruptions, and acne of the female face is predictive of ovulatory dysfunction. It has also been proposed that we find the average face attractive as it is closer to our mental model of a face. Winkielman and Halberstadt have suggested that an average face is faster to process mentally and the brain rewards

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57 *ibid*.

58 Amanda B. Bower and Stacy Landreth, 'Is Beauty Best? Highly Versus Normally Attractive Models in Advertising', *Journal of Advertising,* 30:1 (2001), 1-12.

59 The features give high ratings for attractiveness in men, see Thomas R. Alley and Michael R. Cunningham, 'Averaged Faces Are Attractive, but Very Attractive Faces Are Not Average', *Psychological Science,* 2:2 (1991), 123-25 (p. 123). The conclusion of this paper is that the average face is good looking but 'not ideally attractive'. Another study found sixteen different attributes, such as an optimal age of twenty four, high cheekbones (signalling maturity) combined with babyish features (signifying youth) and other gender prototypical features, see Grammer et al., 'Darwinian Aesthetics: Sexual Selection and the Biology of Beauty', *Biological Reviews,* 78:3 (2003), 385-407 (p. 392).

60 Y. Eisenthal, G. Dror, and E. Ruppin, 'Facial Attractiveness: Beauty and the Machine', *Neural Computation,* 18:1 (2006), 119-42.

61 Katherine Frith, Ping Shaw, and Hong Cheng, 'The Construction of Beauty: A Cross-Cultural Analysis of Women's Magazine Advertising', *Journal of Communication,* 55:6 (March, 2006), 56-70.

62 Donald Symons, 'Beauty Is in the Adaptations of the Beholder: The Evolutionary Psychology of Human Female Sexual Attractiveness', in *Sexual Nature, Sexual Culture*, ed. by Paul R. Abramson and Steven D. Pinkerton (London: The University of Chicago Press, 1995), pp. 80-118 (pp. 96-97).

63 A preference for smooth skin texture may have evolved as an indicator of good health, see Grammer et al., 'Darwinian Aesthetics: Sexual Selection and the Biology of Beauty', *Biological Reviews,* 78:3 (2003), 385-407 (pp. 396-97).

itself for pattern matching so quickly.[64] They support their argument by showing that pictures of fish, shoes and trees that have been averaged are also found to be more attractive.

This section considers Albert Moore, an artist who sought to represent female beauty through most of his artistic life. Moore was closely associated with Aestheticism and all of his post-1865 works can be seen as representing forms of perfect beauty.[65] Although he is little known today, he was an important artist; Whistler described him as 'the greatest artist that, in the century, England might have cared for and called her own' and Sidney Colvin wrote: 'Mr. Moore stands almost alone in the power of finding out for himself and in common nature the sources of this ideal loveliness and of thus forging a new and stronger link between art and truth.'[66] By 1879, he was sufficiently well known to be the subject of satire, a skit in the *Examiner* describing him as '*the* coming man' and his pictures, 'however weak, must be treated with the greatest tenderness and spoken of […] in the subdued tones of awed respect.'[67] By 1886, Cosmo Monkhouse went so far as to write that 'there is no doubt of his claim to stand in the first rank of living English artists'.[68] Moore did not write any books and few letters remain; however, his student, Albert Lys Baldry (1858-1939), wrote a biography shortly after Moore's death and Robyn Asleson has written an excellent monograph.[69]

Asleson has pointed out that David Ramsay Hay was an influence on Moore and Hay has been singled out as an important theoretical influence on the design reform

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64 P. Winkielman et al., 'Prototypes Are Attractive Because They Are Easy on the Mind', *Psychological Science,* 17:9 (2006), 799-806. Also, Rolf Reber, Norbert Schwarz, and Piotr Winkielman, 'Processing Fluency and Aesthetic Pleasure: Is Beauty in the Perceiver's Processing Experience?', *Personality and Social Psychology Review,* 8:4 (2004), 364-82.

65 Robyn Asleson analyses the influences on the 'art for art's sake' movement in Asleson, *Albert Moore* (2000). My brief summary of his working principles is based on Laurence Shafe, 'Albert Moore and the Science of Beauty' (unpublished master's thesis, Courtauld Institute of Art, 2008). The thesis considered the link between Albert Moore and David George Ramsey Hay, an idea that was first suggested by Robyn Asleson.

66 Whistler's comment is referred to in Asleson, *Albert Moore* (2000), p. 204. The Colvin quotation is in Sidney Colvin, 'The Royal Academy. Third Article', *Pall Mall Gazette* (18 May, 1874), 11-12 (p. 11). Also, see William Michael Rossetti, *Notes on the Royal Academy Exhibition, 1868*, ed. by A. Swinburne (London: John Camen Hotten, 1868), pp. 31-32 who compares his art to the verse of Théophile Gautier: 'the faultless and secure expression of an exclusive worship of things formally beautiful'.

67 'Is Life Worth Living?', *The Examiner* (14 June, 1879), 769-70 (p. 769). The article goes on describe his 'attachment to one young girl', which would be praised if she were his 'betrothed' but is 'scarcely so much to be praised when she is only his model'. It has been suggested that his public, open relationship with his model was the real reason he was never made an Academician.

68 Cosmo Monkhouse, 'Albert Moore', *Magazine of Art,* 8 (1885), 191-96 (p. 191). There are many other positive reviews such as Colvin, 'The Royal Academy. Third Article', *Pall Mall Gazette* (18 May, 1874), 11-12 (p. 11), 'The Royal Academy. Second Notice', *The Examiner* (1876), 521-22 (p. 521), 'The Royal Academy. Second Article', *Pall Mall Gazette* (14 May, 1881), 11-12 (p. 11), and a defence of Moore in J. Comyns Carr, 'Modern Taste', *Pall Mall Gazette* (1874), 2-3 (p. 3).

69 Alfred Lys Baldry, *Albert Moore His Life and Works* (London: George Bell & Sons, 1894) and Asleson, *Albert Moore* (2000).

movement by Keyser and Brett.[70] Hay was an important member of the influential Edinburgh group and he blended Green's transcendental anatomy with Cousin's aesthetics, which included the idea that 'All is symbolic in nature' because it expressed its divine purpose, a similar role to the one Ruskin described for nature.[71] Transcendental or philosophical anatomy was the search for ideal patterns of structure in nature.[72] Prettejohn points out that Cousin was an important influence on early English Aestheticism and we know he was read by Hay as he quoted the translator's comment—that the English believe 'beauty is mutable and special' compared to the German and French writers who believe it is 'simple, immutable, absolute, though its forms are manifold.'[73] The 'type theory' of transcendental anatomy could be regarded as expressing a divine plan or it could be taken as expressing 'purely Platonic and archetypical ideas' and although both were 'tenable on theological and metaphysical grounds' when *Origin* appeared 'the scientific rationale underlying transcendental anatomy and natural theology was destroyed'.[74] Although, apparently 'destroyed by Darwinism', the design reform movement continued to influence later designers of the Arts and Crafts Movement and even Art Nouveau.[75] It was later seen by some as the beginning of functionalism but only if its commitment to ornamentation was overlooked.

Hay was well known in London and was called, with William Dyce, to testify for the Royal Commission that produced a *Report on Design* in 1836 on the status of art in manufacturing.[76] Hay wrote many books on the subject including a summary of his ideas, *Science of Beauty* based on the theory that ideal beauty is based on harmonic proportions that link to musical intervals through a Pythagorean system of ratios.[77] He produced 'a mathematical theory of beauty of abstract colour and form' that 'lived on at

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70 Brett believes that Hay and George Field (1777?-1854) were the most important colour theorists in Britain, Brett, 'Design Reform and the Laws of Nature', *Design Issues,* 11 (1995), 37-49.

71 M. Victor Cousin, *The Philosophy of the Beautiful*, trans. by Jesse Cato Daniel (London: William Pickering, 1848, first published in French in 1837), p. 117. Cousin wrote that it is impossible to define beauty as that which pleases the senses, in direct opposition to Darwin, see Cousin, *Lectures on the True, the Beautiful, and the Good* (1854), pp. 140-41.

72 Philip F. Rehbock, 'Transcendental Anatomy', in *Romanticism and the Sciences*, ed. by Andrew Cunningham and Nicholas Jardine (Cambridge: Cambridge University Press, 1990), pp. 144-58.

73 Prettejohn, *Beauty and Art: 1750-2000* (2005), pp. 71-77. Hay, *The Science of Beauty* (1856), p. 7 quotes Cousin, *The Philosophy of the Beautiful* (1848, first published in French in 1837), pp. 14-15.

74 Keyser, 'Ornament as Idea', *Journal of Design History,* 11:2 (1998), 127-44 (p. 140).

75 *ibid*., p. 128.

76 Alf Böe, 'Victorian Theory of Ornament', *British Journal of Aesthetics,* 3:4 (1963), 317-29 (pp. 322-23).

77 Hay, *The Science of Beauty* (1856), see the chapter on beauty based on numerical ratio, pp. 15-27 and the chapter on colour pp. 67-81.The information about Hay is from Laurence Shafe, 'The Quantification of Beauty', *By the Numbers: The Victorian Quantification of Everything; or From Zero to NINES in Under Two Centuries* (1-3 October, 2010). A summary of Hay's ideas is provided in Appendix 3, page 367.

the Schools of Design'.[78] His approach to the quantification of beauty was part of a classical revival that hoped to recover the secrets of ancient sculpture and architecture. He was aiming to rediscover those secrets using mathematics that were loosely based on the ideas of Pythagoras, particularly regarding the relationship between the beauty of music and the mathematics of musical scales, but his aim was to independently discover a logical system rather than decode ancient texts. Hay and his work influenced both artists and scientists.[79] In 1852, Hay described mathematical rules of beauty for the human figure based on the proportions of classical works of art thought to represent the Platonic idea of beauty.[80]

Plato linked beauty in music with mathematical proportions and Hay developed similar ideas to link beauty with form. Hay and other theoreticians turned to the ancient Greeks both because it was thought they had discovered the ideal proportions of beauty and because the study of ancient philosophy could help their analysis and by 'mid-century design reformers saw themselves as reconciling ancient wisdom with modern achievements'.[81] In *The Principles of Beauty,* Hay provided a diagram of the generalised female form (1852, Figure 99) and showed how the angular ratios conform to musical intervals. Hay's theory was also constructive; he built up forms from basic structures such as three types of line, angle and curve and three primitive shapes, the circle, triangle and square. He then applied ratios to these based on musical theory, for example, the ratio 5:4 corresponded to the third, and the ratio 2:3 to the dominant. From these basic elements, he built up shapes that were more complex and then compared them to classical works, such as the *Venus de'Medici* (Figure 95), the *Portland Vase* and the *Parthenon* (1842, Figure 100).[82]. He showed how each form corresponded to his musical ratios and even gave the musical chord corresponding to each shape. A major aim of Hay's research was the elucidation of the aesthetic principles underlying Greek art and the application of these principles to commercial design.

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78 Keyser, 'Ornament as Idea', *Journal of Design History,* 11:2 (1998), 127-44 (p. 135) explains the connection between Hay and Joseph Henry Green, a surgeon and close friend of Samuel Taylor Coleridge (1772-1834) and for many years anatomy lecturer at the Royal Academy of Arts. See Joseph Henry Green, 'Beauty and Expression as the Elements of the Fine Arts', *The Athenaeum,* 842 (16 December, 1843), 1108-11.

79 Decorative art was influenced through Hay's association with the Schools of Design and James Clark Maxwell's first paper, which concerned the construction of oval curves, was influenced by Hay and Maxwell's theory of colour vision used Hay's terminology, Peter Michael Harman, *The Natural Philosophy of James Clerk Maxwell* (Cambridge: Cambridge University Press, 1998), p. 14.

80 Hay, *The Natural Principles of Beauty* (1852), pp. 7-23.

81 Keyser, 'Ornament as Idea', *Journal of Design History,* 11:2 (1998), 127-44 (p. 128).

82 The Parthenon proportions are analysed in David Ramsay Hay, *The Natural Principles and Analogy of the Harmony of Form* (Edinburgh: Blackwood, 1842), pp. 36-42, the *Venus de'Medici* in Hay, *The Natural Principles of Beauty* (1852), pp. 29-37 and the *Portland Vase* in Hay, *The Science of Beauty* (1856), pp. 82-84.

According to Asleson, Moore 'certainly knew' of Hay's theories and if we compare Hay's perfect female form (Figure 101) with Moore's work *Birds* (1878, Figure 102) we can see many similarities—both have similar faces to the *Venus de Milo* and both have small breasts and proportionally smaller heads compared with, for example, Ingres's *The Spring* (Figure 65).[83]. Both Moore's sketch and Hay's diagram are carefully marked with structural lines. The lines have different purposes as Hay is showing the mathematical proportions of various points of the body and Moore is using the sweeping lines to position major elements of the drawing but both are using the lines as an armature to constrain, control or measure the otherwise free artistic sketch. Moore's complete process began with sketches, which were then constrained by a formal process of aligning them within a grid he drew on the full-size cartoon. Hay's approach was an artistic procedure for constructing perfection based on mathematical ratios but we know from his sketches that Moore worked directly from his models. However, he appears to deal with the face using a different procedure, as they were often not sketched. It is difficult to be precise about facial resemblances but many critics commented on the similarity between Moore's female faces and the face of the *Venus de Milo*.[84] Baldry claimed that Moore always worked from the model so it is interesting to examine his process to see how he modified the model's face to make it more similar to the *Venus de Milo*. Many of his small sketches from 1865 onwards that were not intended as portraits avoid showing the face by either drawing the head turned away or by leaving the face undrawn or partly drawn (for example, Figure 103 and Figure 104).

Moore's work exemplified Green's 'transcendental anatomy' in so far as he worked from individual 'specimens', his models, directly from nature, and, as Baldry wrote, he then idealized them, leaving the underlying pattern or structure.[85] Baldry explained that he included 'all blemishes and imperfections' in the initial sketches and 'reserved for another stage the amendments that his knowledge of what was best in both nature and art taught him to be necessary'.[86] Although Baldry does not explain exactly what this step involved we can see from his sketches and his finished work what the process might have been. In one larger drawing what appears to be a sketch of a face from life has been drawn alongside the full drawing in which the face is still being constructed (Figure 105). His larger drawings show what appear to be idealized faces and his full-size cartoons show the same face as the paintings. This idealization process is indicated by Baldry when he writes that he 'studied Nature's perfections instead of her peculiarities; and made beauty his aim rather than spectacular effect' which suggests,

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83 Asleson, *Albert Moore* (2000), p. 95.

84 See *ibid*., p. 96, which provides references to critics comments in the *Saturday Review, Blackwood's Magazine* and *Scribner's Magazine*.

85 To what extent Moore generalised his figures is complicated by the fact that Baldry tells us that he selected his models carefully as perfect beauties.

86 Baldry, *Albert Moore His Life and Works* (1894), p. 73.

despite the above quotation, that he included ‘all blemishes’, he appears to have avoided drawing any detail and then idealized at the next stage.[87] One possible exemplar for Moore was classical sculpture. Moore combined the rigour of working from nature with a technique that modified a carefully selected model based on the faces and bodies of classical statues and he then desexualised the body to create a form of ‘ideal beauty’.

In order to appreciate Moore’s work from a Darwinian point of view we can start by looking for ‘little exaggerations’ that Darwin mentioned were necessary to create a perfect beauty. We find such exaggerations in Rossetti’s work, such as the elongated neck in *Bocca Baciata* but Moore’s work is notable for avoiding exaggeration in line, shape, tone or hue. The faces are all very similar with symmetrical features and a lack of idiosyncrasies suggesting he was avoiding the particular. The process is similar to that used when producing an average portrait by merging images except that Moore also pre-selected the images to be merged. Classical figures were one way of associating a figure with what was regarded as a high point of artistic achievement but by the mid to late Victorian period the classical, and Moore’s work, was beginning to look old-fashioned.[88] His style was a unique combination of ornamental design, fresco techniques, Japanese elements and figures based on classical exemplars of beauty.

An importance influence on the ornamental designs in Moore’s work was his formal training at the School of Design in York. William Dyce and Richard Redgrave had produced a twenty-three stage course that was adopted by Henry Cole (1808-1882) in 1852, the year Moore started at the York School.[89] Moore attended the School between 1852 and 1856 and the influence of Dyce’s book can be seen by comparing pages from Dyce’s book, *The Drawing Book of the Government Schools of Design* (1842-43, Figure 91) with a similar design used by Moore in *Birds* (1878, Figure 102) which can be seen as a combination of p. 26, bottom left and p. 29 top right. The sweeping lines on p. 29, bottom left, are also similar to those used in the sketch (Figure 106). In addition, the palmette or anthemion on p. 36, top right, is similar to the motif used by Moore, although the symbol was a common decoration in classical antiquity. Moore’s interiors in paintings such as *Silver* (1885-6, Figure 107), and *Jasmine* (*c*. 1884, Figure 108) often used geometric patterns and abstract designs for the furnishings and wallpaper of a type that

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87 *ibid*., p. 70.

88 As early as 1873 a reviewer could describe Moore’s work as ‘the pseudo-classic type, which was more in vogue a few years ago than it is now’, 'The Royal Academy. First Notice', *The Examiner* (3 May, 1873), 465-66.

89 Frayling, *The Royal College of Art* (1987), pp. 40-41 and Stuart MacDonald, *The History and Philosophy of Art Education* (Cambridge: Lutterworth, 2004, first published 1970), pp. 188-89. The stages were for example, ‘1. Linear geometry by the aid of instruments’ and ’10. Drawing of foliage, flowers, c. from nature’.

was taught by the Schools but he combined these with the human figure, sometimes nude and with naturalistic plants and flowers.[90]

A close study of Moore's sketches shows that every aspect of his painting was controlled by sinuous underlying armatures and even his naturalistic figures were tightly constrained by the same 'architectural' framework. Asleson emphasised his use of 'abstract formal principles' and we know from Baldry's biography that his work was constructed using a formal process for both line and colour. As part of this formal process, he often used both a curvilinear and a rectangular grid to anchor key parts of the work and many of his drawings have mathematical calculations in the margins (Figure 109).[91] The pouncing lines on the cartoons follow the outlines of the figures and objects but they also follow the grid lines implying that he transferred them to the final canvas surface (Figure 110). The use of a grid has been discussed by Rosalind Krauss in the context of modern art, for example in the work of Mondrian, and she discusses how the grid functions 'to declare the modernity of modern art' by introducing 'antinatural, antimimetic and antireal' elements but Moore is engaged on a different project from the artists of the early twentieth century.[92] Grids have been used by artists to scale small drawings to full size cartoons but Moore's grids are sinuous and appear to be used to align remote elements of the picture, such as the angle of an upper arm with a raised chin (Figure 111). Moore's lack of a subject is antinarrative and it was often described as decorative but his paintings are not 'antimimetic'. For Moore the grid is beneath the surface and its effects are to control alignment and proportions, it is not a symmetrical frame that compresses the surface into meaning. The importance of the grid is demonstrated by the pouncing holes that were used to transfer the grid lines to the final canvas, one assumes in order to provide a framework for the precise positioning of the components in the final picture. Moore does not abandon nature but constrains it, generalises it and decontextualizes it.[93]

Asleson suggests the grids imply an underlying set of construction lines that further tie the composition together. For example, *A Venus* (1869, Figure 11) and *A Garden* (1869, Figure 112) exhibit many of these characteristics. His formulaic approach

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[90] The Schools did not all teach drawing from life but we know from a Select Committee report that the York School of Design was providing 'a class for drawing from the life' in 1848 and that 'Mr. Etty' was able to give it his 'personal attention', *Reports from the Select Committee on the School of Design* (London: The House of Commons, 1849), p. 365. Etty was born in York, died on 13 November 1849 in Coney Street, York, and his statue was erected outside the York Art Gallery in 1911, so it is likely his influence and the classes continued after his death.

[91] The numbers do not occur on all the drawings and cannot be readily related to the drawing, some are long divisions, which implies they may be concerned with scaling the sketches. Some drawings also include faint sketches, notes, scribbles and pouncing holes in odd groups on otherwise blank areas of paper.

[92] Rosalind Krauss, 'Grids', *October,* 9 (Summer, 1979), 50-64 (pp. 50-60).

[93] Prettejohn, *Art for Art's Sake* (2007), p. 104.

has been linked by Asleson to his architectural training, the approach of the Design Schools he attended and Hay.[94] We know that Moore was good at mathematics and this would have inclined him to be sympathetic to a formal, mathematical theory of beauty based on proportions. Asleson points out that the *Building News* singled out *Azaleas* (Figure 113) as the 'only decorative painting' at the Royal Academy Exhibition and one that 'ought to have been hung with the architectural drawing' and she associates the vestiges of his 'system of line arrangement' on the full-size drawing at the V&A with his 'understanding of architectural design'.[95] This understanding led to a close relationship with architects including William Nesfield and we know that Moore's family expected him to become an architect.[96] His system of line arrangement can also be explained in terms of decorative design principles and theories of beauty based on mathematical proportions that require an arrangement of lines to measure and control the forms.

By arranging figures that do nothing in a non-existent world, Moore was denying the viewer the distraction of the mental activity of storytelling. Moore's paintings are often associated by art historians with classical works that might have been influences. However, as he tried to avoid creating a historic setting it is unlikely that he intended such references to create a context for interpretation.[97] It is only in his last few paintings, such as *The Loves of the Winds and the Seasons* (1893, Figure 114) that he moves from abstract beauty to an allegorical representation.[98] Luna Ennis, writing ten years after Moore's death, described his art as 'beauty for its own sake, abstract art crystallized into

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94 Elizabeth Prettejohn, *After the Pre-Raphaelites: Art and Aestheticism in Victorian England* (Manchester: Manchester University Press, 1999), pp. 115-34.

95 Asleson, *Albert Moore* (2000), pp. 98-99.

96 Robyn Asleson, 'Nature and Abstraction in the Aesthetic Development of Albert Moore', in *After the Pre-Raphaelites: Art and Aestheticism in Victorian England*, ed. by E. Prettejohn (Manchester: Manchester University Press, 1999), pp. 115-34 (p. 124) and Asleson, *Albert Moore* (2000), p. 13.

97 For example, Richard Green points out in *'The Moore Family Pictures'* the similarity between *The Elements* (1866, private collection) and Pompeian wall painting, Elizabeth Prettejohn in *Art for Art's Sake* between *The Venus* (1869, York Art Gallery) and the *Venus de Milo* and Robyn Asleson points out in *Albert Moore* the similarity between both *The Marble Seat* (1865, whereabouts unknown) and *Study for a* '*A Greek Play'* (1867, V&A) and the Parthenon east pediment, the similarity between *Apricots* (1866, Fulham Public Library) and Pompeian wall painting, between *A Musician* (1865-6, Yale Center for British Art) and a wall painting from Herculaneum called *The Music Lesson*, between *A Garden*(1869, Tate Gallery) and a Stabiaen wall painting called *Spring* and between the figures on *The Portland Vase* and both *The Toilette* (1886, Tate Gallery) and *A Summer Night* (1884-90, Walker Art Gallery), see Richard Green, *The Moore Family Pictures: Paintings Watercolours and Drawings by Albert and Henry Moore Their Brothers William, John Collingham and Edwin and Their Father William Moore Snr* (York: York City Art Gallery, 1980), p. 32 and Prettejohn, *Art for Art's Sake* (2007), p. 126 and Asleson, *Albert Moore* (2000), pp. 69, 79, 87, 92, 108, 84, 85.

98 An interpretation based on the poem he wrote is in Edward Morris, *Public Art Collections in North-West England* (Liverpool: Liverpool University Press, 2001), p. 30. An alternative interpretation is that it is a *memento mori* completed days before his death. An old man by a river, possibly the Styx, is restrained as he considers chasing after two young figures running through the corn (suggested as Zephyr chasing Spring). A storm, perhaps death, approaches the old man but the young and beautiful figures are surrounded by spring flowers, indicating life. The female figure in the foreground on the right looks like the model used in his early paintings and poignantly she retains her beauty.

a decoration with music as its theme'.[99] Ennis was writing about Moore's *A Quartet, a Painter's Tribute to the Art of Music, AD 1868* (Figure 115) and as she pointed out the 'violins are an anachronism with the Greek draperies' but she added, this was irrelevant as they were introduced for their decorative effect, their own beautiful lines and the graceful poses taken by the players.

Moore's close study of nature was emphasized by Baldry as a part of his working principles, 'Of this system the beginning, middle, and end, were one and the same thing, study from Nature.'[100] However, critics often complained that his paintings were merely decorative. For example, after his death a review of Baldry's biography in *The Times* said it 'does not follow he was in any sense a great man, […] or his art other than decorative'.[101] This appears to be because he treated the natural elements formally, as abstract designs, rather than as, say stories from mythology. Many Victorian critics thought this emphasis on the formal and abstract meant the work was deficient both morally and intellectually although others believed that he had managed to bridge the gap between the geometric disciplines of decorative art and fine art. The incorporation of geometric elements within fine art and the use of a formal matrix places Moore's work in the forefront of modernism but the way he makes use of classical references places him in the nineteenth-century neoclassical revival. Moore confounds a direct classical interpretation as his compressed, often intensely decorated spaces resist narrative interpretation and he often draws attention to the paint surface and introduces classical anomalies, such as a violin. In this way, Moore united the beauty Darwin found in symmetry and proportion with the Darwinian beauty that results from sexual selection.

A Venus

Moore's *A Venus* (first shown at the Royal Academy in 1869, Figure 11) is one of a number of paintings produced in the 1860s and 1870s of the nude in a vertical format with the figure placed within a tightly constrained space that creates an intimate connection between the viewer and the figure.[102] Moore's painting has a number of eccentricities that suggest the figure is intended as a formal expression of abstract or ideal beauty. I have selected this painting as an example of the new genre of the full-length nude in order to discuss the representation of classical beauty and its relationship with Darwin's theory.

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[99] Luna May Ennis, *Music in Art* (Boston: L. C. Page, 1903), p. 191.
[100] Baldry, *Albert Moore His Life and Works* (1894), p. 71.
[101] 'Review of Albert Moore: His Life and Works', *The Times* (22 November, 1894), 7.
[102] Other examples include Leighton *Venus Disrobing for the Bath* (1867, private collection) and a full-length male nude in Burne-Jones *Phyllis and Demophoön* (1870, Birmingham Museums and Art Gallery).

Baldry wrote that Moore gave 'serious consideration' to 'the finest examples of Greek art' and *The Saturday Review* pointed out that the torso of his 'repulsive' Venus had been taken from the 'Venus of Milo'.[103] Like these works his figures' faces are rounded with full chins, small full lips, large pointed noses and relatively small eyes with thick wavy hair pulled back from their faces. The face can usefully be compared to both the *Venus de'Medici* (Figure 95) and the *Venus de Milo* (Figure 96). Another interesting point of comparison is to consider it alongside a face that has been averaged from women found in London in 2004 (Figure 116), as this indicates a generalised face with no exaggerated features and this helps indicate those features he chose to modify.[104]

All the Venuses have fuller cheeks, narrower mouths and a more pronounced chin than the average face. Moore's *A Venus* and the *Venus de'Medici* have dimpled chins but the other two have rounded chins and the average London face has a larger chin. All three Venus faces have small mouths with full lips but the average London face has a larger mouth with a less pronounced curl of the top lip. Moore's *A Venus* has the largest eyes and the two classical statues the smallest and Moore's *A Venus* has the thinnest cheeks with the most pronounced cheekbones. As mentioned, recent research has shown that large eyes and pronounced cheekbones added to an average female face improve its attractiveness score, which indicates Moore may have been exaggerating features that make the face more attractive.[105] The classical figures have rounded cheeks, and the jawline of the *Venus de'Medici* and the average London face are heavier and more pronounced than the other two and the three Venuses have thin but large, Grecian noses and lower hairlines. Moore's *A Venus*, like the *Venus de Milo,* has thin, arched eyebrows, the *Venus de'Medici* has falling eyebrows and the average London face thicker, arched eyebrows. In terms of the overall proportions of the faces, Moore's *A Venus* has fine, balanced proportions, the *Venus de Milo* has balanced but heavier proportions, the *Venus de'Medici* heavy proportions with the weight low down and the average London woman has a larger face with well balanced, medium proportions. Overall, Moore's Venus is closest to the *Venus de Milo* but with larger eyes, a less heavy jaw and the almost dimpled chin of the *Venus de'Medici.* This suggests that Moore was using some of the features of the classical works combined with features such as large eyes, that were admired in Victorian Britain.

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[103] Baldry, *Albert Moore His Life and Works* (1894), p. 70, 'The Royal Academy', *Saturday Review of Politics, Literature, Science and Art*, 5 June 1869, pp. 743-45, p. 745. The likeness of the figure to the *Venus de Milo* was also mentioned by J. Beavington Atkinson, 'The London Art Season', *Blackwood's Magazine,* 106:646 (August, 1869), 220-39 (p. 224) and 'The Royal Academy', *Art Journal,* 91 (July, 1869), 197-204 (p. 201).

[104] The average woman's face was taken by Mike Mike and represents the average of the mix of nationalities found in London in 2004, see page 160.

[105] Alley and Cunningham, 'Averaged Faces Are Attractive, but Very Attractive Faces Are Not Average', *Psychological Science,* 2:2 (1991), 123-25 (pp. 123-24).

Little or nothing is known of the early history of the *Venus de'Medici* or the *Venus de Milo* but the history of their reception traces significant changes in our society.[106] The *Venus de'Medici*, now in the Uffizi, Florence, was first recorded, for certain, in the Villa Medici in Rome in 1638.[107] In the eighteenth century, it was regarded by many people as the most beautiful classical female figure although there were some dissenters, particularly regarding the restored arms with their long tapering fingers. Some authorities now believe it to be a first century BCE Athenian copy of a bronze original derived from the Cnidian Venus of Praxiteles. The *Venus de Milo* was found on the island of Melos in the spring of 1820. It was bought by the French and put on display in the Louvre the following year where it conveniently replaced the *Venus de'Medici*, which had just been repatriated to Italy. There was disagreement among French academics about its original form and this prevented any attempt at restoration. During the nineteenth century, it gradually took over from the *Venus de'Medici* as the 'most perfect combination of grandeur and beauty in the female form'.[108] It is now believed, by some, to be a second century BCE revival of an earlier pre-Hellenistic ideal.

If we next consider the bodies of the two classical statues, then the first consideration looked at from a Darwinian perspective is 'that of a *mutilated woman*' and Peter Fuller points out that the Greeks would have looked upon the figures as they are today with 'fear, loathing and incomprehension'.[109] Fuller and others have seen the beauty as inexorably linked to the mutilation while others, such as Kenneth Clark look at it '*as if* it were in the same physical condition in which it appeared to the Greeks'.[110] Mutilation protects the figure from its Darwinian association with desire by creating a socially acceptable representation. The ugliness of the mutilation heightens the expression of beauty by disassociating it from the biological and creating something timeless, although the convention of the damaged archaeological object of classical beauty is itself a recent social convention. By recreating the original from the fragment, Moore has removed the ugliness with the consequential loss of those ruptures and ambiguities that give the original its contemporary aesthetic life. He could not paint a copy of the mutilated statue without it becoming a study but by painting a restored woman, he is in danger of slipping into simply painting a naked woman. Moore avoids this danger by

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[106] Elizabeth Prettejohn, 'Reception and Ancient Art: *The Case of the Venus De Milo*', in *Classics and the Uses of Reception*, ed. by Charles Martindale and Richard F. Thomas (Oxford: Blackwell, 2006), pp. 227-49.

[107] Haskell and Penny, *Taste and the Antique: The Lure of Classical Sculpture, 1500-1900* (1981), pp. 325-30. This paragraph is based on Haskell's description of the history of the *Venus de'Medici* and the *Venus de Milo*.

[108] Samuel Phillips, *Guide to the Crystal Palace and Park*, 2nd edn (London: Bradbury and Evans, 1854), p. 54.

[109] Peter Fuller, *Art and Psychoanalysis* (London: Writers and Readers Publishing Cooperative, 1980), p. 96.

[110] *ibid*., p. 97.

referencing the classical original; by mutilating the paint surface he makes a possible reference to the mutilated marble of the original.

We can also compare Moore's figure (Figure 11) with Hay's (Figure 101), who wrote in detail about the match between his ideal female form and the *Venus de'Medici* and *Venus de Milo*.[111] Hay explained that his system handles the beauty of Hercules as well as the beauty of Venus because he deals with the ratio of angles that stay the same irrespective of the size and musculature of the figure. He argued that the beauty of the face depends on the harmonious combination of perfect figures in geometry and this gives the face the ability to express the passions.[112] Hay disagreed with Camper's work on facial angle and concluded that unless there is 'conformity in every feature […] throwing the forehead forward on the face produces deformity'.[113] He concluded that other writers still dispute the origin of the 'ideal beauty' found in Greek art but those who attribute the beauty of Greek sculpture to the 'selection of parts from various models, must be in error.'[114]

Hay described his method of calculating the harmonic proportions of the face based on seven angles that correspond to the tonic, dominant, median and subtonic in music. Consider Plate IX (Figure 117) and isosceles triangles AGG, AKK, ALL, AMM, ANN.[115] The human figure was analysed by Hay based on an outline derived from the '*Venus of Melos* and *Venus of Medici*'.[116] He used twelve angles to define the figure, three for the tonic, three dominants, two mediants, two subtonics and a supertonic. The angles are shown in Plate X (Figure 118) and the body in Plate XI (Figure 119). The body was analysed in detail in *The Geometric Beauty of the Human Figure Defined* and *The Natural Principles of Beauty Developed in the Human Figure* (1852), which refers to the '*Venus of Medicis'*. He restricted himself to the external contour of the form of the parts of a female figure 'such as those of statues of the *Venus of Milos* and *Venus of Medici*'. In order to check the ratios of the female form produced by the sculptors of Ancient Greece he took his measurements from a cast of the '*Venus of Medicis*'. He was assisted by John Goodsir, Professor of Anatomy, University of Edinburgh and Rev. P. Kelland, Professor of Mathematics and the measurements were taken in 1851. They obtained six female models and measured their full height, the vertical length of their head, the vertical position of the superior end of their sternum, nipples, navel and the 'horizontal branch of the pubes'.[117] They also measured the width of the top of their shoulders, the distance

[111] Hay, *The Natural Principles of Beauty* (1852), pp. 29-37.
[112] Hay, *The Science of Beauty* (1856), p. 55.
[113] *ibid*., p. 56.
[114] *ibid*., p. 57.
[115] *ibid*., p. 59.
[116] *ibid*., p. 63.
[117] Hay, *The Natural Principles of Beauty* (1852), p. 30.

between their nipples, across their pelvis, and the depth of their chest below the breasts. They then 'selected the Venus of Medicis, as one of the finest and most complete specimens by which the theory could be tested'.[118] As the sculpture is bent over it suffers from what Hay calls depressions, differences from the vertical, and he constructed a machine for correcting them.[119] By this means, the measurements of the vertical Venus were obtained and it was shown that the greatest discrepancy between Hay's theoretical proportions and the Venus was less than a quarter of an inch.[120] Hay felt that this tiny difference was so remarkable that it 'warrants the belief in a similar system having formed the basis of artistic education among the ancient Greeks at their period of greatest excellence in the arts of design.'[121]

Hay was establishing a theoretical system of ratios but Moore was creating a beautiful figure. We must consider the extent to which Moore copied the figure of a Venus or was simply inspired to produce something similar. I will consider five relevant figures, the two classical Venuses, Moore's *A Venus* and Whistler's *Venus* (*c*. 1868).

Moore was not making a strict copy of either Venus as the arms are at a different angle.[122] Prior to 1883, the upper body of the of the *Venus de Milo* leaned forward and to the side slightly more than the statue does today.[123] The upper body of Moore's nude drops on the statue's left and the left hip is raised but on the *Venus de Milo* the right upper body drops but the pelvis is roughly horizontal. In the most relaxed contrapposto position, that is one in which the muscles of the leg not taking the weight are most relaxed, the body weight is taken by the foot that is flat on the ground, that leg is straight and that hip is higher. In this position, with the relaxed leg taking little weight the body's centre of gravity must be over the heel that is flat on the floor. The location of the centre of gravity is determined by the twist of the upper body but when upright it is on a line that runs through the sternum and centrally between the clavicles. Moore's figure is well balanced with the line running down through the heel and with the right leg taking little

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[118] *ibid*., p. 29.

[119] He found they could take the measurements they needed with only slight adjustments made to correct for the depressions. The machine consisted of two vertical posts seven feet high between which were sandwiched a pile of horizontal rods, which were pushed against the back of the Venus cast and clamped. The model nearest in size to the Venus was asked to pose so that her back was pushed against the rods and the measurements were then made and compared with the measurements made when she was vertical. This enabled them to determine the distortion caused by the fact that the Venus leans over and twists. This was then repeated for the front of the Venus and then the model.

[120] Hay, *The Natural Principles of Beauty* (1852), p. 33.

[121] *ibid*., p. 34.

[122] The left arm is missing entirely from the *Venus de Milo* but the raised shoulder indicates the arm must have been raised. In Moore's painting, the right arm is raised above the head, which lifts the pectoralis major muscle as it runs over the shoulder. There is no indication of this on the *Venus de Milo* indicating that the arm was raised but not above the head.

[123] The statue was made from two pieces of marble and the upper body and lower body were found as separate pieces that could be assembled in different ways.

weight. The *Venus de Milo* is more unnatural with the upper body appearing to lean too far to the figure's left. This could be explained if we knew what the arms held; the heavier the object the more the body would need to lean to compensate as there must be equal weight distributed on either side of a line drawn vertically from the heel. The *Venus de Milo* also has the right foot on a low plinth, which could cause the right leg to take more weight. A drawing made in 1821 (Figure 120), judged by the head position, shows the upper body positioned further back and to the right, in order to cause the head to be raised.[124] In addition, the lower body of the *Venus de Milo* is clothed and Moore has painted a nude.

Regarding the *Venus de'Medici* the contrapposto position is similar in that the figure's left leg takes the weight in both and the left hip is raised. However, in the *Venus de'Medici,* the shoulders are level and the upper body leans forward. The arms are later additions and we do not know the position of the original arms but the level shoulders and posture suggest they would not have been raised and could have been in some form of Cnidian modesty posture. As mentioned, when Moore painted the figure of the *Venus de Milo* it had usurped the *Venus de'Medici* as the epitome of classical beauty but casts of both were used in the York School of Design that Moore attended.[125] The *Venus de'Medici* leans forward as if the figure is about to walk. The weight is distributed between the feet and the pose is less like Moore's figure than the *Venus de Milo*. The head is turned sharply to one side and is more upright than that of the Moore figure and the *Venus de Milo*.

The above comparison suggests that Moore took elements of both statues to construct an original figure, which was like the *Venus de Milo* but differed in essential details. Moore's painting practice was always to first sketch from a nude model which would suggest he asked a model to position herself in a position similar to the *Venus de Milo* but looking out of the picture to our right, a direction which suggests moving forward in our culture. If the figure's left leg had been raised this would have thrown the balance away from the direction of sight. Moore has therefore chosen a balanced posture and the gap left by the indented right leg has been filled by the chair to balance the lower part of the painting.

Whistler was a good friend of Moore at the time and was painting his 'Six Projects' series, one of which was *Venus* (Figure 121).[126] It is said that Whistler kept a

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[124] The engraving shows the statue reassembled before it went on public display in 1821 at the Royal Museum (now the Louvre).

[125] Haskell and Penny, *Taste and the Antique: The Lure of Classical Sculpture, 1500-1900* (1981), pp. 325-30. See Asleson, *Albert Moore* (2000), p. 206, endnote 21.

[126] Whistler's indebtedness to Moore was noted at the time until he became too 'distinctly influenced by Albert Moore', see Asleson, *Albert Moore* (2000), p. 98 and footnote 103 (216).

cast of the *Venus de Milo* in his studio in order to help him modify drawings he made from life.[127] His *Venus* is a sketch that shows a contrapposto position similar to the *Venus de Milo* and reversed from Moore's figure. The body is draped and the material is blown by the wind. It is retained by a raised left arm and the figures right arm drops to its side. The figure stands on the seashore next to the surf and is more active than the other Venuses. From its position it looks as if the figure could be stepping forward rather than standing in a static contrapposto position. The figure may have been inspired by Moore's *Shells* painting (Figure 122). Whistler's *Venus* is looking towards us and has an unusual open and inviting posture for a classical Venus figure. The shoulders are level and the weight is taken by the back leg while the front leg is almost lifted from the ground. He has experimented with different arm positions with one down close to the figure's side and the other raised and holding a thin piece of drapery that blows back in the wind. The figure is situated on the seashore reinforcing the classical myth of her birth from sea-foam. The position of the feet is like that of the *Venus de Milo* with the straight right leg that is taking the weight behind the left leg, which is forward and raised. The legs of Moore's *Venus* are positioned in the same way as the *Venus de'Medici* with the weight taken by the straight left leg and the right foot is behind the left with the heel raised. Whistler's *Venus* has an open pose with the arms wide and the figure framed by flowing drapery that is similar to the drapery of Leighton's *Daedalus and Icarus* (Figure 9). The drapery performs a similar function in that it frames both figures and isolates them from the surroundings enabling them to be shown enclosed in their own world while standing in an open landscape.

Considering the proportions of Moore's figure and its musculature, it also differs from the classical Venuses. The two Venuses have rounded bodies with small breasts, poorly defined musculature, large hips and buttocks and a waist-to-hip ratio of about 0.7. Moore's *Venus* has well-defined rectus abdominis muscles, like an athlete and like many statues of Greek men. The breasts are not completely natural, they almost appear to have been added later, and the waist-to-hip ratio is unusually high for the period. Moore's painting was criticized for not being feminine enough because of his treatment of the skin, which indicates he may have intentionally de-feminised the figure both by his surface finish and by the androgynous features mentioned. Winckelmann wrote that the form of the ideal figure of classical sculpture 'consists in the incorporation of the forms of prolonged youth in the female sex with the masculine forms of a beautiful young man'.[128] Moore created a mixture of elements from male and female Greek statues perhaps in order to create an image of perfect beauty without the sexuality associated with a naked woman. Darwin makes it clear that beauty is associated with sexual desire but Moore appears to want to avoid associating beauty and desire and has desexualised the image.

[127] *ibid*., p. 96.
[128] Winckelmann, *Essays on the Philosophy and History of Art* (2005), p. 318.

The original *Venus de Milo* combined sexual desire and beauty and an opposition between them has been created by the damaged surface, the white marble, the lost arms and its respectable classical associations. This enables the viewer to balance the two by framing the beauty within the mutilation and damage. As mentioned, Moore could not paint an armless Venus and balanced the two factors by using a skin colour like marble, a 'damaged' paint surface and elements of androgyny. The danger Moore avoided is that these 'ugly' elements could have overpowered the beauty and the figure could then have become grotesque.

The waist-to-hip ratio (WHR) is an important signifier of both health and beauty according to recent research.[129] The modern preferred ratio is about 0.7 but in the Victorian period, there was a fashion for very small waists and therefore a low WHR.[130] For example, Lillie Langtry (1852-1929) went from an extremely low WHR of about 0.46 to 0.57 in later life.[131] The WHR of Moore's *A Venus* is 0.75, closer to a male WHR of 0.8 than contemporary fashion.[132] The WHR of the figures in various other Moore paintings are 0.74 in *A Wardrobe* (Figure 123), 0.7 in *A Bathing Place* (Figure 124), and 0.71 in *A Yellow Room* (Figure 125). These ratios are close to the modern ratio and to classical statues, such as the *Medici Venus,* which has a WHR of 0.72.[133] This indicates that Moore was influenced by these figures but he went further towards the masculine proportions perhaps not just to desexualize the image but like Simeon Solomon, to combine elements of feminine and masculine beauty. A WHR of 0.7 has been suggested not as a recent fashion but, as mentioned earlier, one of the universal attributes of beauty.[134] One critic noted that about the *Venus de Milo*, 'the body [...] in proportion it

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[129] 'Among human females waist-to-hip ratio (WHR) is a reliable index of age, hormonal status, parity, fecundity, and health', Symons, 'Beauty Is in the Adaptations of the Beholder: The Evolutionary Psychology of Human Female Sexual Attractiveness', pp. 80-118 (p. 91).

[130] *The Family Herald* (1848): 'acknowledged that the "healthy average waist" was not less than 26 inches […] the social queens of the time boasted of 18-inch waists or even smaller', Elise Liu, 'The Infamous Hourglass: Constructing the Perfect Female Figure', *Essays from the Expository Writing Program: Harvard College* (2008), 1-8 (p. 2).

[131] Accurate measurements are difficult to obtain. It is reported that her measurements when young were 38-18-38", which is a ratio of 0.47 but from photographs the ratio appears to be between 0.50 and 0.55 when she is wearing a corset and petticoats but photographs can be manipulated and it could be higher.

[132] J. Fan et al., 'Visual Perception of Male Body Attractiveness', *Proceedings of the Royal Society B: Biological Sciences,* 272:1560 (2005), 219 (pp. 219-26).

[133] it is difficult to measure WHR from a painting as the hip measurement depends on the size of the buttocks. However, the same problem occurs with a lot of the research as photographs are used, see Frank Marlowe, Coren Apicella, and Dorian Reed, 'Men's Preferences for Women's Profile Waist-to-Hip Ratio in Two Societies', *Evolution and Human Behavior,* 26:6 (2005), 458-68, which discusses frontal WHR compared to WHR measured with a tape measure.

[134] Singh, Renn, and Singh, 'Exploring the Health and Beauty Link', *Proceedings of the Royal Society B: Biological Sciences,* 274:1611 (2007), 891-94 (p. 894). The article claims to have found that a small waist is 'an invariant symbol of feminine beauty'.

differs but little from the male, but it is very feminine […] It especially resembles the male figure in that it has no waist'.[135]

Another technique for de-sexualising the nude was to change the texture of the skin. A marble-like skin was associated with classical sculptures and therefore learning and antiquity. Albert Moore allowed the canvas to show in his *A Venus* (1869, Figure 11). However, he went too far for some critics who described it as masculine, but it was enthusiastically reviewed by Colvin. It was a difficult balancing act for the artist; Atkinson described the painting as a 'repellent picture of "Venus," borrowed apparently from the Venus of Milo. Such nudities are quite unobjectionable, because absolutely disagreeable. The figure is neither marble, paint, nor flesh, but stucco'.[136] Reverend Richard St John Tyrwhitt, champion of 'chaste nudities' made a point that applies to all these techniques, 'We hazard the conjecture that he painted it on such coarse canvas on purpose that the nude figure may look like the picture of a woman, rather than like a woman.'[137] Moore and other artists were negotiating a maze of desire and impropriety by painting the nude in such a way that it looked like pigment on canvas and so emphasized the decorative beauty of the image while minimizing the danger of it being associated with sexual desire. The artist and the viewer therefore had to negotiate symbolic associations, such as a classical setting, that enabled the two aspects to be socially segregated.

Darwin's prosaic view was that perfect beauty in each race consists of little exaggerations in certain characteristics away from the existing common standard. Our wish for variety results in these characteristics changing over various time periods. Within a lifetime there are fashions based on the social norms, such as a very small waist. Over many generations sexual selection operates to create racial 'fashion', such as a large posterior, and over longer periods sexual and natural selection appear to give rise to attractiveness based on markers for health, such as symmetry and a smooth skin, and fertility. Over even longer periods, Darwin suggested that the beauty we find in 'symmetry or figures with some regular recurrence' is shared with the lower animals although he

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[135] John Collier, 'Varying Ideals of Human Beauty ', *Nineteenth Century and After,* 49:287 (January, 1901), 116-30 (p. 122).

[136] Atkinson, 'The London Art Season', *Blackwood's Magazine,* 106:646 (August, 1869), 220-39 (p. 224). He makes the point that one cannot object to a nude that is disagreeable, possibly because it evokes no desire in the viewer.

[137] Asleson, *Albert Moore* (2000), p. 105 and R. St John Tyrwhitt, 'Pictures of the Year', *Contemporary Review,* 11 (May, 1869), 355-74 (p. 360). Greenberg defined the essence of Modernism as 'the use of characteristic methods of a discipline to criticize the discipline itself, not in order to subvert it but in order to entrench it more firmly in its area of competence'. His radio talk is re-printed in *Art in Theory 1900-2000: An Anthology of Changing Ideas*, ed. by C. Harrison (Oxford: Wiley-Blackwell, 2009), p. 774 and in his talk he also quotes Cézanne 'One has to be a painter through the qualities themselves of painting, one has to use coarse materials.', Clement Greenberg, 'Cézanne and the Unity of Modern Art', in *The Collected Essays and Criticism: Affirmations and Refusals, 1950-1956*, ed. by John O'Brian, 4 vols (Chicago: University of Chicago Press, 1995), III, pp. 86-88 (p. 88).

gives no reason why it should have evolved.[138] Regarding the daily 'capricious changes of customs and fashions' he criticises a writer who identifies this as a characteristic that distinguishes humans from other animals as he believes the lower animals are 'likewise capricious in their affections, aversions, and sense of beauty'.

The transcendental anatomists denied that beauty could be reduced to mere appearance and the gratification of the senses. However, by creating a mathematical system of ratios Hay contained beauty within a formal structure, which he claimed was based on re-discovered classical canons of beauty making it acceptable to the transcendental anatomists particularly when its application was limited to the area of decorative art. Albert Moore took the sensual beauty of the human body and constrained it with a formal armature based on Hay's ideas filtered through the training programme of the Schools of Design. He was accused of turning the nude into a decorative form but he was forging a unification of the sensual and the decorative in order to create a perfect beauty.

Concluding Remarks

We have seen that Darwin ruled out the possibility of an ideal beauty, as he believed that if all women looked like the *Venus de'Medici* then the need for variety would give higher value to the slight exaggerations of certain features. This preference would result in the preferential selection of mates with those features, which over time would give rise to the significant exaggeration of those features. Darwin did not accept a higher notion of beauty but believed it was a cultural and racial construct. He also recognized the formal beauty of a microscopic diatom or a seashell and this created a link between beauty and mathematics. Some designers and artists investigated the mathematical basis of beauty and this provided a link between the abstract form of a beautiful human body and a beautiful flower. The beauty we find in symmetry and proportion may be an element of why we find the average face more beautiful.

Artists were dealing with what could be called perfect beauty by generalising natural forms and by working within some of the formal constraints of classical art. The design reform movement rejected the mimetic representation of natural forms and looked for the structure and symmetry that lay beneath the surface differences. Albert Moore combined such geometric and decorative forms with the human body using a formal grid to constrain the elements. He created a representation of the nude that retained its beauty without invoking the sexual desire that Darwin associated with the hairless naked body.

[138] Darwin, *Descent*, 2nd, tenth thousand edn (1874), p. 93. The quotations in the next sentence are from the same page.

Chapter 6: The Ugly, Grotesque and Degenerate

One of the major changes that took place during the course of the nineteenth century was a reappraisal of what we mean by beauty. I consider this change indirectly by examining what was understood by the ugly, the grotesque and the degenerate. These attributes can be regarded as the opposite of beauty but they were each dealt with by critics in a different way. What was understood as beautiful changed as a result of a reappraisal of these attributes. An 'ugly' painting, for example, could be one that was regarded at the time as morally deficient but this value judgement changed over the course of the century. An image could be described as grotesque as a criticism or a term of praise and towards the end of the nineteenth century many of the paintings we have considered were linked with what was regarded as the moral and physical degeneration of the nation. The artworks and Darwin's ideas were both important factors in bringing about these changes. The use of the words 'ugly', 'grotesque' and 'degenerate' by critics signalled a significant reaction and these terms were indicators of what we now call modern art. During the course of the nineteenth century the words changed their meaning as a result of many social factors but I shall be examining the influence of Darwin's ideas and the impact of the work of a number of leading artists.

Dickens's amusing but savage attack on Millais's *Christ in the House of His Parents* (1849-50, Figure 12) was an important defining moment for modern art as the 'ugly' started to play an increasingly important role. Millais broke with the convention of showing idealised religious subjects by placing them in a dirty and naturalistic world and many of the critics found this morally unforgiveable. Darwin would also upset religious conventions by looking at the world in a new way and he helped define what we mean by 'ugly' in terms of physical appearance rather than moral value. The way in which Darwin defined ugliness disassociated it from moral worth and associated it with exaggeration or the features of certain animals. Darwin understood that each race appreciates the things to which it is has become accustomed and it is those things that are seen as beautiful. Later, however, Darwinism was used by Galton to link 'ugly' faces with crime and mental illness through his work on facial types. Certain critics, such as Dickens, associated dirt and disease with ugliness and therefore with moral depravity. Artists, such as Millais, who transposed a subject that was traditionally idealised into a conventional setting created a revolutionary break with that tradition and with our understanding of ugliness.

Grotesqueness can be associated with a humorous reaction to objects or scenes that would otherwise invoke terror or a fear of the unnatural. Without humour, the grotesque becomes disgusting or horrific. I show that Darwin transformed images that would otherwise be seen as grotesque into objects of beauty through his sympathy and

understanding. This implies that the grotesque is concerned with the unfamiliar and that what we describe as grotesque can change through familiarity. Artists, such as Dresser, also used what could be seen as grotesque objects to create objects of beauty. Ruskin looked at the grotesque in a very specific way that distinguished between what he called the ignoble grotesque, which involves mockery and cynicism, and the noble grotesque, which uses humour to comment sincerely about an essentially unknowable and mysterious world.

The ugly and the grotesque must be distinguished from the idea of degeneration, which became a fear that hung like a storm cloud over the mid to late Victorian period. The breakdown in certain established social conventions was regarded as evidence for the degeneration of society, which it was believed would lead to the physical deterioration of future generations. In 1892, Max Nordau (1849-1923) published *Entartung* (*Degeneration*), in which he assembled these fears into a credible narrative.[1] He called upon Darwin's theory to support his idea that many works of contemporary art, music and literature were corrupting society because the artists that produced them were weak-minded 'mystics' rather than sensible, down-to-earth practitioners. He thought the epitome of degeneracy and what he called the mystical approach was the Pre-Raphaelite Movement because its artists chose a pseudo-medieval period set outside of time and space and its ideas were based on the 'hysterical thoughts' of the Oxford Movement.[2] Pre-Raphaelitism, he believed, was a corruption of German Romanticism inspired by Ruskin whom he singled out as 'one of the most turbid and fallacious minds' of the nineteenth century.[3] The mythic had been elevated by Ruskin to become the ultimate truth but Nordau now placed mysticism at the heart of the degenerate indicating a fundamental cultural change.[4] I show how Nordau used the pseudo-Darwinian idea of degeneration to forge a link back from the modern art of the *fin-de-siècle* to the tradition-breaking art of the Pre-Raphaelites.

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1 It was first published in German in Berlin in 1892 and then published in English as *Degeneration* in 1895 by D. Appleton & Co. Max Nordau was born Simon Maximilian Südfeld and was co-founder of the World Zionist Organization. One of the earliest expressions of concern regarding degeneration in a Darwinian sense was Charles Kingsley, *The Water-Babies: A Fairy Tale for a Land-Baby* (London: Macmillan, 1898, first published 1863, first illustrated by Sambourne 1885) and more theoretically Herbert Spencer, *First Principles* (London: Williams and Norgate, 1862), pp. 518-37, Chapter 23, 'Dissolution'.

2 Max Simon Nordau, *Degeneration*, ed. by George L. Mosse (London: University of Nebraska, 1895), p. 77.

3 *ibid*.

4 'Mr. Ruskin on Burne-Jones and The "Mythic School"', *Birmingham Daily Post*, 16 May 1883, John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XXXIII, pp. 287-305, 'Mythic Schools of Painting: E. Burne-Jones and G. F. Watts' and Nordau, *Degeneration* (1895), pp. 45-240, Book 2, 'Mysticism'.

The Ugly

In 1844, *Vestiges* linked ugliness with poor living conditions and quoted Buffon as saying 'coarse, unwholesome and ill-prepared food makes the human race degenerate. All those people who live miserably are ugly and ill-made.'[5] Whether the poor were the way they were because of their poor living conditions or whether they were born with certain limitations and inclinations was a debate that continued through the nineteenth century. If beauty is determined by sexual selection then ugliness can be seen as a Darwinian failure but socially it was more than just physical appearance; it was assumed that the ugly were morally deficient. Umberto Eco points out that 'The first and most complete *Aesthetic of Ugliness*, written in 1853 by Karl Rosenkrantz, draws an analogy between ugliness and moral evil.'[6] That is, when a person is described as ugly the implication is that their behaviour is morally repugnant. Eco adds that whereas the synonyms for 'beautiful' can be conceived as disinterested the same cannot be done with those for ugly as they 'contain a reaction of disgust, if not violent repulsion, horror, or fear.'[7] The ugly forces our involvement.

There was frequently a link between the ugly and the poor and their dirty conditions, which were linked to disease and crime. However, reviews of paintings of the poor were often phrased within the respectable moral reaction of charitable sympathy. For example, the poor and destitute in Luke Fildes, *Applicants for Admission to a Casual Ward* (1874, Figure 126) were generally reviewed sympathetically; *The Morning Post* described its 'intense feeling and deep thought'.[8] In fact, the term 'ugly' was rarely used, although one review of the Royal Academy exhibition of 1871 described the 'insane passion for the ugly' in many of the works on show that year including portraits by P. H. Calderon (1833-1898) and Francis Grant (1803-1878) and a group of women in another painting were described as the ugliest since Millais painted 'a similar number, sipping

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5 Chambers, *Vestiges*, 1st edn (1844), p. 281. The word 'degenerate' did not have the same connotations as when it was used by Nordau at the end of the century. In *On the Degeneration of Animals* (1766) Buffon used the term to explain what we would call varieties. He thought families of animals had 'degenerated' over time in response to migrating to new locales that had different environmental factors. He did not believe in evolution, that one species could change into another, but his scientific approach to understanding variation caused by environmental factors makes him, for many, the father of evolutionism.

6 Eco, *On Ugliness* (2007), p. 16. Eco shows the wide range of associations of the word 'ugly'; he has chapters on related subjects as diverse as death, monsters, the obscene, witchcraft, the uncanny and kitsch.

7 *ibid*.

8 *Applicants for Admission to a Casual Ward* first appeared as 'Houseless and Hungry', an illustration in *The Graphic* that resulted in Millais recommending Fildes to Dickens to illustrate *Edwin Drood*. 'Royal Academy', *Morning Post*, 2 May 1874, p. 3.

buttermilk under an apple-tree'.[9] This was an interesting comment as the young women in Millais's *Spring* (*Apple Blossoms*) (1859, Figure 130) appear attractive but the ugliness may be the moral ugliness we shall see later that Ruskin and other critics associated with their appearance. Austin's use of the word 'ugly' to condemn what he believed was a widespread cultural deterioration is similar to the way Nordau later used the word 'degenerate'. Frith was regarded as the principle offender because he represented 'ugly' scenes, such as *Margate Sands* [sic] (*Ramsgate Sands*, 1852-4, Figure 127) and *The Railway Station* (1862, Figure 128).[10] He also singled out Leighton as the only artist with a sense of beauty and although he thought he had failed in this endeavour at least, like Icarus, he 'tries to get himself wings'.[11] The scenes were believed to have been chosen for their ugliness and the source of pleasure and interest was thought to come from their grotesqueness, which was separated into several types, including the 'beautiful-grotesque' of Leighton's *Greek Girls Picking up Pebbles by the Sea* (*c*.1871, Figure 129).[12]

Other writers regarded ugliness as related to a lack of utility or goodness. In a humorous article that was also written in 1871, called 'Why Is This Ugly?', the author, who signed himself 'An Ugly Man', contemplated his friend's vases and found them as ugly as his 'horrid complexion' which he explained was a result of their failure to fulfil any practical purpose.[13] He equated beauty with usefulness, which for his skin he thought was the ability of a clear complexion to make visible the energetic, living body beneath it. There was also a direct link between moral depravity and ugliness, which could negate beauty. This was illustrated by a review of the Royal Academy exhibition of 1859 in which the beautiful girls in Millais's *Spring* (*Apple Blossoms*), referred to above, were associated with ugliness resulting from their moral depravity; the critic wrote: 'every one of them ugly and ungraceful, with hard features, strained skins, and in broad day with cheeks and lips painted as if for the footlights.'[14] Ugliness was often described in terms of its purpose or intent. Millais's young girls, for example, were 'ugly' because of the heightened colour of their cheeks and lips, which implied an intention to seduce. Webb reached his conclusions about the inner mental activity of the represented people based on certain signs, such as 'heightened colour', which provided the clue to what he regarded as their

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9 [Alfred Austin], 'The Royal Academy', *Temple Bar,* 32:128 (July, 1871), 462-74 (pp. 466, 468). The author is attributed by Wellesley; Austin Alfred (1835-1913) was a man of letters, proprietor and editor of the *National Review* (1883-1900). The Millais painting was *Spring* (or *Apple Blossoms*), which was first exhibited in 1859. The article may have been intended to be humorous but humour is a good indicator of cultural sensitivities.

10 *ibid*., p. 470.

11 *ibid*., p. 473.

12 *ibid*., p. 472.

13 An Ugly Man, 'Why Is This Ugly?', *Good Words,* 12 (January, 1871), 748-51 (p. 750).

14 [Benjamin Webb], 'The Art Exhibitions of 1859', *Bentley's Quarterly Review,* 1:2 (June, 1859), 582-628 (p. 592). The author is attributed by Wellesley; Benjamin Webb (1819-1885) was a clergyman who played an important role in the Cambridge Movement.

inner moral ugliness. Ruskin thought the picture was beneath Millais's considerable ability and the faces were unsightly and grim giving the impression of a scene from Dante's *Inferno* where young girls who had been 'vainly gay' were sentenced to 'sip scalding milk out of a poisoned porringer'.[15] The blossom links the time of year with the time of life of the girls providing an innocent interpretation of youthful enjoyment but the symbolism of the scythe seems to demand a darker explanation. This could be a *memento mori*, as some critics suggested, or it could suggest a transgression or the incipient sexuality of the girl in yellow who is the only one looking out of the picture, as she lies flat on her back with her legs apart while stopping her mouth with a grass stalk. The girl was modelled by Alice Gray (1845-1929), Millais's sister-in-law, and she also posed for the girl leaning on her elbow.[16] The scythe pointing at her heart is an unusual symbol for such a delicate scene and its prominence and the extirpation of its handle leaving only the blade seems to demand an explanation, such as the death of innocence or the pain of first love. The unusual symbolism and the close relationship between Millais and the model suggests there may have been some darker personal explanation.

Darwin discussed the physical and visual aspects of ugliness in humans and wrote that it 'consists in an approach to the structure of lower animals' and added that features that were unlike any lower animal would still be regarded as 'utterly hideous' if they were exaggerated, such as 'eyes twice as large as usual'.[17] In other words Darwin recognized two forms of human ugliness, one in which the person looks like a 'lower animal' and the other where a certain feature is exaggerated too far. He made the important point that each race prefers 'what they are accustomed to behold' and 'hideous deformities' such as deep scars on the face or the septum of the nose pierced with sticks 'are all admired locally'.[18] Ugliness, like beauty, is therefore relative and in *Descent* Darwin gives the example of New Zealanders who are beardless and who believe 'there is no woman for a hairy man'.[19]

Darwin felt ugliness deeply and in his Notebook N he described the 'sensation of disgust with nausea', when his stomach was unsettled, 'at the thought of almost anything

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15 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XIV, pp. 215-16, 'Academy Notes'. Millais wrote to his wife, Effie Millais, on 15 May regarding Ruskin's review 'The wickedness and envy at the bottom of all this are so apparent to me that I disregard all the reviews (I have not read one)', *The Life and Letters of Sir John Everett Millais*, ed. by John Guille Millais (London: Methuen & Co., 1899), p. 323.

16 Effie Millais wrote in her notebook about the painting 'The picture, whatever its future may be, I consider the most unfortunate of Millais' pictures. It was begun at Annat Lodge, Perth, in the autumn of 1856, and took nearly four years to complete. […] Alice is there too, in two positions, one resting on her elbow, singularly like, and the other lying on her back with a grass stem in her mouth', *The Life and Letters of Sir John Everett Millais*, ed. by Millais, p. 324.

17 Darwin, *Descent*, 1st edn (1871), II, p. 354.

18 *ibid*., p. 130. See page 74.

19 *ibid*., p. 349.

ugly'.[20] In the same notebook, he described how a two and a half year old boy was frightened when his older sister approached him with gauze over her head and Darwin wondered if ugliness was associated with the same feeling of fear, which he described as a 'beau-ideal feeling', that is the perfect embodiment of the feeling. He also mentioned another baby that was frightened of wild beasts in the zoo and he linked both displays of fear with ugliness. An important distinction is between the ugly and the disgusting as the latter is a strong revulsion that could have evolved as although different cultures recognize different things as disgusting, the expressions used, such as turning up the nose and spitting, are similar throughout the world.[21] Disgust has also played a role in aesthetic theory and Carolyn Korsmeyer describes what she calls 'aesthetic disgust' which invokes a feeling akin to the sublime but resulting from the pleasant conceptual resolution of a disgusting situation or story.[22]

Darwin also considered the possibility that ugliness was a sign of ill health. He referred to an *Edinburgh Review* article that reviewed Archibald Alison's book *Essays on the Nature and Principles of Taste* (1811), which he described as excellent (doubly underlined) but felt it was 'deficient in not explaining the possibility of ~~handsome~~ ugly healthy young women'.[23] This comment suggests that Darwin wondered about the possibility of a healthy young woman being described as ugly as the article he referred to associated beauty with 'youth and health'.[24] Modern research has suggested that beauty is the response to the signs of a healthy person, in which case ugliness could be the response to signs of ill health such as an overweight body, a lack of facial symmetry and skin blemishes.

Darwin's association of ugliness with features of the lower animals is a reminder of the many myths of humans turned into animals to make them too ugly to be loved. The classic fable of 'The Frog Prince', for example, describes how a beautiful Prince was hidden within the form of an ugly frog by sorcery. The test of the Princess is that she must honour her promise to love the frog at which point the Prince is released from his spell and turns back into a handsome young man. Walter Crane illustrated this story in *The Frog Prince* (1874, Figure 131). Crane's illustration modified the convention used to show Darwinian evolutionary transformation. Normally, such transformations are shown as a sequence of gradual changes as one form changes into the other. Crane shows a

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20 Darwin, *Notebook N: Metaphysics and Expression*, p. 113.
21 Darwin, *Expression, 1st Edn* (1872), p. 260.
22 Korsmeyer, *Savoring Disgust: The Foul & the Fair in Aesthetics* (2001), p. 3.
23 Darwin, *Old & Useless Notes*, p. 14, Note that my transliteration of Darwin's handwriting differs from the standard as I read the word 'handsome' as crossed through and replaced by 'ugly healthy'. Alison associates the beauty of bodily form with fitness, Alison, *Essays on the Nature and Principles of Taste* (1821, first published 1790), pp. 386-92.
24 Francis Jeffrey, 'Review of Alison's "Essays on the Nature and Principles of Taste"', *Edinburgh Review,* 18:35 (May, 1811), 1-46 (p. 10).

cartwheeling frog being dismembered into eyes, limbs and body and then reassembled into the same components of the prince. The last but one image of the Prince still has a dismembered head and limbs with frog's feet and in his final form, the frog's spots have become sunflowers printed on the clothes of the Prince and the Princess looks on amazed as the transformation takes place. The illustration suggests that the transformation was not evolutionary but mechanical, like a steam engine being disassembled and reassembled as a locomotive. Crane may have wanted to show that this was not a natural process but a mechanical reassembly. The idea of an ugly exterior hiding a beautiful person had a long history but Darwin and certain artists suggested that the physical appearance should be re-evaluated, in other words they were implying that what needs to change is not the frog but the observer.

Christ in the House of His Parents

Darwin described not only beauty but also loathing, disgust and ugliness and it is interesting to compare his ideas with the critical reaction to Millais's *Christ in the House of His Parents* (1849-50, Figure 12). The reaction to Millais's painting was unprecedented. As mentioned, the term 'ugly' was rarely used to describe fine art yet this painting was described not only as ugly but as hideous, loathsome and disgusting. There were many reviews and they have been frequently analysed but in summary, the most unfavourable criticism and perhaps the best known was the satirical piece by Dickens in his *Household Words*. He claimed the Pre-Raphaelites through perversity were rejecting four centuries of artistic development and were offering 'Old Lamps for New Ones'.[25] Dickens described Mary as 'horrible in her ugliness' and clarified what he meant by ugly:

> Wherever it is possible to express ugliness of feature, limb, or attitude, you have it expressed. Such men as the carpenters might be undressed in any hospital where dirty drunkards, in a high state of varicose veins, are received. Their very toes have walked out of Saint Giles's.[26]

This suggests physical disgust and an association with the poor, and with disease and crime. Dickens makes this clear with the phrase 'walked out of Saint Giles's' as the district was well known for its crime and it was a notorious area with 'the worst living conditions in all of London's history; this was the lowest point which human beings could reach'; nicknamed 'The Holy Land'.[27] Dickens was not the only critic to link ugliness with disease, *Blackwood's Edinburgh Magazine* wrote that the painting contained 'Ricketty children, emaciation and deformity' and 'we can hardly imagine anything more ugly,

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[25] Charles Dickens, 'Old Lamps for New Ones', *Household Words,* 1:12 (15 June, 1850), 12-14.
[26] *ibid*., p. 12.
[27] Peter Ackroyd, *London: The Biography* (London: Vintage, 2001), p. 137, 138. Dickens was sympathetic to the appalling conditions in St. Giles that resulted in disease and high child mortality and he argued later for the need for improvements to be made, Charles Dickens, 'Life and Death in Saint Giles's', *Household Words,* 1:451 (13 November, 1858), 524-28.

graceless, and unpleasant'.[28] Dickens also described Christ as 'hideous, wry-necked, blubbering' and the whole painting with its 'ugliness of feature, limb, or attitude' expressing 'what is mean, odious, repulsive, and revolting'. He was also discussing class when he described their toes as having 'walked out of St. Giles's' as he was saying that the poor should not be used as models for the Holy Family and the main reason given was that they were ugly to the extent that they were 'deserving of hatred'.[29]

The terms 'repulsive' and 'revolting' are related to Darwin's connection between ugliness and nausea and this is related to the feeling of disgust. Darwin associated the ugly with the appearance of the lower animals, with highly exaggerated features and with feelings of nausea and fear. None of the figures in Millais's painting satisfies these Darwinian requirements. In Darwinian terms, the Holy Family appears to have been regarded as a separate race and one with its own standards of beauty that artists should represent by means of certain conventions.

In the painting, Christ has red hair, which Paull Baum described as traditionally associated with Judas Iscariot and he described red hair as both 'ugly' and a 'sign of degeneration'.[30] There is a catalogue of attributes but none of them appears to be ugly in a Darwinian sense. For example, Mary's eyes are almost closed and ringed in black and her brow is heavily lined, which combined with the twist of her neck, gives her a distorted appearance and Joseph's arms are veined and muscular, his nails are dirty, his left knee is damaged and his toenails are broken although not as dirty as might be expected from the nature of the work. The descriptions of the critics therefore seem exaggerated, suggesting they reflect a reaction to other aspects of the painting.

In the *Art Journal* Ralph Wornum wrote: 'the most beautiful soul must have the most beautiful body' indicating that the moral worth of a character, in this case the Holy Family, must be signified by a beautiful body.[31] *The Times* critic wrote that the picture 'is, to speak plainly, revolting' and there was 'no conceivable omission of misery, of dirt, and even disease, all finished with the same loathsome minuteness'.[32] *The Athenaeum* also wrote that 'we recoil with loathing and disgust' at the 'pictorial blasphemy'.[33] The 'loathsome minuteness' in *The Times* review suggests a feeling of disgust or even nausea resulting from the excessive and inappropriate detail. What is morally shocking to

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28 [Frederick Hardman], 'The Pictures of the Season', *Blackwood's Edinburgh Magazine,* 68:417 (July, 1850), 77-93. Wellesley attributes the article to Frederick Hardman (1814-1874), a novelist and journalist.

29 'Odious' means 'deserving of hatred', *OED*.

30 Paull Franklin Baum, 'Judas's Red Hair', *Journal of English and Germanic Philology,* 21:3 (July, 1922), 520-29 (pp. 526-27).

31 R. N. Wornum, 'A General Discussion of the Young England School', *Art Journal* (1 September, 1850), 270-71.

32 'The Exhibition of the Royal Academy. Third Notice ', *The Times*, 9 May 1850, p. 5.

33 'Royal Academy', *The Athenaeum,* 1179 (1 June, 1850), 590-91 (p. 591).

the reviewer is the minute detail, which suggests we are looking at something that is forbidden and so it must be seen only in some generalised or modified form. A visual process that attends to minute detail can be associated with scientific observation, which is here deemed inappropriate, as the subject is one for emotional or spiritual contemplation rather than intense looking. It is as if the knowledge acquired through looking gave rise to disgust as too much was seen that should be hidden. If seeing is equated with knowing then the critics were arguing that there are areas we should not investigate as the knowledge is loathsome.

The room is unnaturally bright and evenly lit and the source of the light is on the left. In Millais's preparatory sketches, there is a window on the left, which is cut off in the final painting and is the notional source of the light. The figures have the idiosyncratic features associated with particular people and we know that they were modelled by Millais's family and friends. Millais went to a carpenter's shop in Oxford Street to sketch its interior in order to represent a carpenter's tools and method of working accurately. The tools are those of a nineteenth-century carpenter and the clothes are a mixture of Middle Eastern, conventional religious symbolism, such as Mary's blue dress and St. John's animal fur, with nineteenth-century additions, such as Christ's smock. Clearly, Millais was not trying to reproduce a historically accurate carpenter's shop but an accurately observed contemporary carpenter's shop with figures that were modelled on friends and family. Millais engaged with his art by means of direct observation and had chosen to visualize a religious scene that was usually represented through the imagination by this means. He was anchoring his imagination in the world of appearances; the opposite process to the one he would engage in later with *Autumn Leaves*. In both cases he was blurring the distinction between physical reality and imagination.

The terms loathing, disgust and similar words occur in many of the reviews and they were discussed by Darwin in *Expression*.[34] He associated disgust with revolting things primarily through taste but also the 'sense of smell, touch, and even of eyesight' and he linked extreme or loathing contempt to disgust.[35] He showed a photograph of Oscar Rejlander (1813-1875) simulating the expression (Figure 132) and connected the extreme reaction with vomiting as a mechanism to expel unusual food. Winfried Menninghaus writes: 'In eighteenth-century aesthetics, "disgusting" does *not* (yet) import the maximally negative predicate of an aesthetic judgement of taste, but rather a quality that wholly exceeds the condition for the possibility of an aesthetic judgement.'[36] Today,

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[34] Darwin, *Expression, 1st Edn* (1872), pp. 254-62. William Miller's first chapter is on 'Darwin's Disgust' and he states that 'Modern psychological interest in disgust starts with Darwin', Miller, *The Anatomy of Disgust* (1997), p. 1.

[35] Darwin, *Expression, 1st Edn* (1872), p. 254.

[36] Menninghaus, *Disgust: The Theory and History of a Strong Sensation* (2003), p. 5.

the term is used to mean extremely disagreeable but Millais's critics may have intended the eighteenth-century use, that the painting was so revolutionary that it exceeded their ability to judge it.

The critics also pointed out that the painting is full of anachronisms such as the mixture of costumes from different periods and the Victorian carpenter's tools. Michaela Giebelhausen believes that Millais carefully constructed these anachronisms in order to create an ahistorical setting.[37] In the eighteenth century, she points out that such an ahistorical setting was associated with religious devotion as it prevented a painting from being seen as a genre painting set in a particular time and period. Its composition is unusual as the figures are situated around a central table and Millais may have taken this from representations of the Last Supper. Possibly the most famous is Leonardo's *Last Supper* (1490s, Figure 133) and although the space is very different it has interesting similarities. If we compare Millais's final painting with his sketch (Figure 134) we see he has distorted the perspective in order to make it appear that the horizon has been lowered to a point just above Christ's head. However, the angle of the bench remains unchanged suggesting a much higher horizon. Millais has introduced a small section of ceiling beams on the right to suggest the type of enclosed architectural structure we find in Leonardo's painting. Both have three areas behind Christ with walls either side that enclose the figures by a strong sense of receding perspective that takes the eye past Christ to provide a volume of space surrounding him. Millais painted Leonardo's *Last Supper* in the background of *Mrs Wyatt and her Daughter* (*c*.1850, Figure 135)

If we compare the study to the final painting, we can see that Millais made a number of changes with respect to ugliness. The figure of Anne has a rounded and homely face but in the study, she has a thin, gaunt and pointed face with staring eyes. Joseph has had his beard trimmed in the painting, his hair has been combed, he is balder and his expression is gentler. The relationship between Mary and Christ has changed. In the study, Mary is distraught and is being comforted by Christ but in the final painting, a rounder faced Christ with neater hair is about to kiss Mary's proffered cheek. The beautiful birds and flowers outside the windows on the left of the sketch have gone avoiding a distraction from the main relationships. Overall, the final painting is tighter, more enclosed, the figures are more homely and we have been taken down to Christ's level to focus on the relationship between him and Mary, which has been made more ambiguous.

It is clear from the sketches now in the Tate Gallery (Figure 136), the Fitzwilliam Museum and the Victoria and Albert Museum that Millais put a great deal of planning and

[37] Giebelhausen, *Painting the Bible: Representation and Belief in Mid-Victorian Britain* (2006), pp. 117-120.

thought into the composition and the figures. Giebelhausen believes the sketches show the influence of Annibale Carracci's *The Butcher's Shop* (1580-90, Figure 137), which was on display in the library of Christ Church College when Millais visited Oxford in the summer of 1849.[38] Others have thought that the painting was influenced by John Rogers Herbert's *Our Saviour Subject to His Parents at Nazareth* (1847-60, Figure 138) and Albert Boime suggests that Annibale Carracci's (1560-1609) *The Holy Family in a Carpenter's Shop* (*Le Raboteur*) (Figure 139) could have been an influence as it is possible Millais might have seen the illustration. A third Carracci painting, *The Holy Family with the Infant Saint John the Baptist* ('*The Montalto Madonna*') (*c*. 1600, Figure 140), might also have been an influence as it shows a central Mary and Christ placed in front of a table with a section of wall behind them with an opening either side. The left opening looks out onto countryside and the right opening is part of the interior. Joseph is on the right leaning towards Christ with a similar thrusting head movement. John the Baptist is in both paintings and in both, there is a woven basket on the left.

The conceit of Christ prefiguring his crucifixion by cutting his palm on a nail emphasises the link between the physical reality of daily work and the spiritual significance of what appears to be an accident. Christ's small stature compared with the height of the table also suggests that Millais was representing an accident resulting from childish enthusiasm rather than a stage-managed event. This is also suggested by the assistant at the left ignoring the interruption to his work, Joseph's perfunctory examination and the look of 'I told you not to meddle' on St. John's face.[39] Mary is holding her head back for a kiss suggesting she is the injured party and St. Anne offers practical assistance rather than comfort. Through the open entrance, a group of sheep stare over a fence inquisitively suggesting there could have just been a noisy scene. Millais linked the highest spiritual subject, the Holy Family, with the lowest rung of society, the urban poor, and turned a spiritual prefiguration into an everyday accident. It is unlikely that Millais was trying to overthrow religion as from his letter to F. G. Stephens concerning *Autumn Leaves* about six years later he explained that he had been inclined to put an extract from the Psalms in the catalogue.[40] However, like Darwin, he was someone who relied on observation and the consequence was to undermine convention by showing the Holy Family as normal people.

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38 Christopher Baker, *Christ Church Picture Gallery* (Oxford: Christ Church Picture Gallery, 2002), pp. 68-69.

39 Expressions that Giebelhausen describes as 'thoughtful' and 'exceedingly pragmatic', Giebelhausen, *Painting the Bible: Representation and Belief in Mid-Victorian Britain* (2006), p. 114.

40 Warner, *The Victorians: British Painting 1837-1901* (1996), p. 73. Barlow describes Millais as 'sceptical, seemingly wary of religiosity, while retaining conventional "Church of England" Christianity', Barlow, *The Art of John Everett Millais* (2005), p. 214.

By associating themselves with artists that pre-dated the formation of Protestantism the Pre-Raphaelites linked themselves with Puseyism, the Oxford Movement, and the widely resisted move towards Catholicism.[41] This was reinforced by their unconventional approach to religious symbolism. The painting was therefore seen to be subversive and an attempt to undermine Protestant beliefs. This aspect of the Pre-Raphaelite movement is spelled out in Max Nordau's *Degeneration*, discussed in more detail later in the section on 'The Degenerate' (page 206).

It is clear from the critical reaction that his painting was as revolutionary as Darwin's ideas and was seen as an extreme attack on the conventions and hypocrisies of representing religious subjects. Fourteen years later, in Paris, Manet caused a similar reaction by undermining bourgeois notions of respectability with *Olympia* (1863, exhibited 1865). Millais used a different style from Manet, in some ways more devastating as Millais was known as a prodigious artistic talent. The application of this talent was criticized and the Pre-Raphaelite approach was later condemned by Nordau as a failure to focus because of its all-over intensity of observational detail. Millais was revolutionary in the way he brought the Holy Family within the physical confines of scientific observation with the associated consequence of making it a human family with all the Darwinian consequences. However, the critical response changed over the years and by 1898 the painting was 'passionately admired, and even loved'.[42] By the end of the century, the painting was no longer regarded as ugly and 'blasphemous'. This might be because Millais had become accepted as a member of elite society but the painting had also lost its ability to shock as the changes it brought about in the way we see the world had become established. Darwin and Millais helped undermine conventional religious interpretations and bring about a more physical reading of previously spiritual subjects. The acceptance of Millais's painting demonstrates an ability to accept the physical within the spiritual rather than requiring the spiritual ideal to be represented by the physical ideal. In the end, Millais successfully overcame an entrenched prejudice and created what could be considered one of the first modern paintings.[43]

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41 For example, one reviewer mentioned 'a leaning to Puseyism', [David Masson], 'Pre-Raphaelitism in Art and Literature', *British Quarterly Review,* 16:31 (August, 1852) (p. 209). Wellesley attributes the article to David Masson (1822-1907), critic and editor of *Macmillan's Magazine*.

42 'Royal Academy', *The Times*, 1 January 1898.

43 Candidates for the 'first modern painting' include Picasso's *Les Demoiselles d'Avignon* (1907), Manet's *Le Déjeuner sur l'Herbe* (1862-3), Manet's *Olympia* (1863) and many others. I include Millais's painting because it was early (1849-50), influential and enjoyed a strong critical reaction which was expressed in terms of the ugliness, grotesqueness and degeneracy of the painting.

The Grotesque

Many parts of the plant and animal kingdoms that Darwin wrote about can be seen as grotesque. By bringing these unusual natural forms and eccentric creatures into the popular imagination he helped changed the nature of what we regard as grotesque by making the unfamiliar familiar. Before Darwin published the works listed on page 197 Millais had investigated other aspects of the grotesque in *Ferdinand Lured by Ariel* (1850, Figure 13), exhibited in the same year as *Christ in the House of His Parents*. It received a similar adverse reaction but one that was more concerned with its grotesqueness than its ugliness. The critic of *The London Review* had mixed reactions to *Ferdinand Lured by Ariel*; the spirits were described as 'grotesque and beautiful' and overall 'the execution elaborated to a wonder'.[44] The *Athenaeum* described it as 'more senseless in the conception' than *Christ in the House of His Parents* and the *Art Journal* described Ariel as a 'hideous green gnome'.[45] The *Times* described the painting as a 'deplorable example of perverted taste' and *Blackwood's* said that the painting 'inspires rather laughter than disgust'.[46]

One of the earliest modern books to look at the grotesque seriously in terms of aesthetic theory was Wolfgang Kayser's *The Grotesque in Art and Literature*.[47] He highlights three aspects of the grotesque: its association with an estranged world, the way it plays with the absurd, which may involve mockery, cynicism and laughter and its attempt to invoke the demonic aspects of the world. Kayser excludes the conventional fairy world as he sees the grotesque as involving strangeness and terror arising from a loss of predictability. As we shall see, for Shakespeare's Ferdinand the world had certainly become estranged and terrible, as he had heard strange sounds and a voice telling him of his father's death. Michael Steig takes Ruskin's analysis of the grotesque as a combination of the fearful and the ludicrous, as his starting point.[48] He sees the grotesque as arousing anxiety by giving rise to infantile fears but unlike Sigmund Freud's 'uncanny', in which defences against anxiety are weak, threatening aspects of the grotesque are distorted into harmlessness, without completely attaining it.[49] The critics' reaction, in particular *The London Review* and the reference in the *Blackwood's* article to

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44 The quotation demonstrates that the grotesque and the beautiful were not opposites but mutually supportive, 'Men of Mark - No. 24: John Everett Millais', *The London Review,* 4:86 (22 February, 1862), 183-85 (p. 183).

45 'Royal Academy', *The Athenaeum,* 1179 (1 June, 1850), 590-91 (p. 591) and 'The Royal Academy: The Eighty-Second Exhibition-1850', *Art Journal,* 12 (1 June, 1850), 165-79 (p. 175).

46 'The Exhibition of the Royal Academy. Third Notice ', *The Times*, 9 May 1850, p. 5 and [Hardman], 'The Pictures of the Season', *Blackwood's Edinburgh Magazine,* 68:417 (July, 1850), 77-93.

47 Kayser, *The Grotesque in Art and Literature* (1981, first published 1957), pp. 184-86.

48 Michael Steig, 'Defining the Grotesque: An Attempt at Synthesis', *Journal of Aesthetics and Art Criticism,* 29:2 (Winter, 1970), 253-60 (p. 255).

49 *ibid*., p. 258.

a mixture of laughter and disgust suggest the painting or elements of the painting were seen as grotesque.

The term ‘grotesque’ has had a range of meanings derived originally from the designs found on the walls of Nero’s Golden Palace excavated in the late fifteenth century.[50] The Italian term *grotte* (‘cave’ and by extension ‘excavations’) was applied to the type of wall decoration found in the Palace. The adjective used was *grottesco* and the noun *la grottesca,* which became grotesque in English about 1640.[51] This derivation appears to be a neutral description relating the designs to the location where they were found but Vitruvius (Marcus Vitruvius Pollio, c.75 BCE-c.15 BCE) described the interweaving of human, plant and animal forms that was developed during Augustus’s reign and used later in the Golden Palace as ‘monstrous’ and ‘bastard forms’ because they were unnatural and could never exist. Following its discovery, the grotesque style of wall decoration quickly became very popular and it is found in paintings from about 1485 onwards.[52] The modern term ’grotesque’ has since been applied much more widely than just to the designs found in Nero’s Golden Palace but it has acquired similar associations to those it had over two thousand years ago.[53]

By the eighteenth century in England, the word had come to be used to describe oddities, monsters and caricatures and by the nineteenth century, it was poorly defined and often used to describe the ‘comic art of the middle ages’ and Sidney Colvin described the grotesque as, ‘the one form of ugliness which art admits’.[54] The grotesque was brought into much sharper focus by Ruskin who went to great lengths to distinguish between the degenerate Grotesque Renaissance he found in late Venetian architecture and ‘that magnificent condition of fantastic imagination’ of the Northern Gothic grotesque.[55] Despite Ruskin's attempt to clarify the term its meaning has been increasingly stretched to include almost any combination of distortion and humour such

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50 *OED* defines ‘grotesque’ as decorative painting consisting of portions of human or animal forms interwoven with foliage and flowers and it also recognizes the popular meaning of figures characterized by comic distortion or exaggeration.

51 Philip Thomson, *The Grotesque* (London: Methuen, 1972), p. 8.

52 For example, the decoration on the foreground pilasters in Carlo Crivelli’s *l'Annunciazione con Sant'Emidio* (*Annunciation, with St. Emidius*), 1486, Figure 141.

53 This suggests that the grotesque has a universal quality perhaps related to the uncomfortable feeling caused by seeing something that could not exist in nature.

54 F. W. Fairholt, 'Grosteque Design, as Exhibited in Ornamental and Industrial Art', *Art Journal,* 3 (March, 1862), 89-92 recognizes the term is poorly defined and traces its origins back to the wall paintings found during the excavation of the ‘baths of Ancient Rome’. It also connects the grotesque with the ‘primeval Art of all countries’ and gives examples from ancient Egypt, Greece and Rome. Thomas Wright, 'History of Caricature and of Grotesque in Art', *Art Journal* (April, 1864), 115-17 (p. 115) and Sidney Colvin, 'Fine Art: Sixth Winter Exhibition of Old Masters at the Royal Academy (Fourth Notice)', *The Academy,* 143 (January, 1875), 122-23 (p. 122).

55 Ruskin, *The Works of John Ruskin* (1903-12), XI, 145, ‘The Stones of Venice 3’, ‘Grotesque Renaissance’, first published from 1851 to 1853.

as burlesque and even caricature.[56] We therefore find it employed to describe works by Carlyle, Woolner and Watts.[57]

In *The Stones of Venice*, Vol. 3, written mostly during the winter of 1851-1852, Ruskin observed that the grotesque nearly always contains two elements, the ludicrous and the fearful and depending on which of these dominates, it creates what he called either the 'sportive grotesque' or the 'terrible grotesque' although most examples contain parts of both. As the grotesque contains a humorous element he analysed the nature of play and concluded that the noble grotesque is created by those who understand the depth of the things they mock but the ignoble grotesque is created by those that 'feel and understand nothing'.[58] He associated the noble with the skilled Gothic artisan who, he believed, had been free to express the amusing side of his work and the ignoble with the negative, sarcastic and dishonourable artisans of Renaissance Venice who used their work to undermine morality and noble feelings. In *Modern Painters,* Vol. 3 (1856) Ruskin expanded on his earlier analysis by applying it to the art of the sensualist. He associated an 'entirely healthful and open play of the imagination' with 'Shakspere's [sic] Ariel', which, he added, can easily slip into 'evil'.[59] He explained how painting can be used to create a noble grotesque work by using symbols to express a truth that would take a long time to express verbally and he praised the use of symbolism and allegory in a wide range of works. He also distinguished between false and true ideal art. In the category of false ideal art he placed nearly all religious art including that of Raphael which he described as 'tasteless poison' because there is 'no possibility' of what is being represented 'ever having existed'.[60]

He went on to describe how 'in many of the works of Watts and Rossetti is already visible, as I trust, the dawn of a new era of art, in a true unison of the grotesque with the realistic power.'[61] What he meant is that they created a realistic interpretation of an abstract idea that was usually represented symbolically. Its grotesqueness is a result of the artist's failure to capture its infinite nature but it is noble as the artist realised this

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56 The Google Ngram viewer shows a steady increase in the use of 'grotesque' during the nineteenth century with a peak in 1900, then a sudden drop followed by a peak in 1925 and then a decline until the present day. The same percentage of books refers to the grotesque in 2000 as in 1840.

57 Paul Barlow, 'Thomas Carlyle's Grotesque Conceits', 37-60, and his 'Grotesque Obscenities: Thomas Woolner's Civilization and Its Discontents', 97-118 and Colin Trodd 'Turning Back the Grotesque: G.F. Watts, the Matter of Painting and the Oblivion of Art', 173-196 in *Victorian Culture and the Idea of the Grotesque*, ed. by Trodd, Barlow, and Amigoni.

58 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XI, p. 167, 'Stones of Venice 3'.

59 *ibid*., V, p. 131, 'Modern Painters 3'.

60 *ibid*., pp. 82-83, 'Modern Painters 3'. A similar criticism to that of Vitruvius. It might be thought that grotesque Gothic statues never existed but Ruskin argued that they are functionality correct and so *could* have existed unlike grotesque Venetian Renaissance statues.

61 *ibid*., p. 137, 'Modern Painters 3'.

shortcoming. Ruskin later used the term 'myth' rather than grotesque realism and considered that Rossetti's place had been taken by Burne-Jones and Watts. This surprising description of Rossetti's early work as grotesque is discussed by Maggie Berg who concludes that Ruskin appreciated the ambivalence of Rossetti's vision resulting from his attempt to 'deify external beauty'.[62] When Millais exhibited *Christ in the House of His Parents* at the Royal Academy in May 1850 Rossetti had exhibited only two paintings—*The Girlhood of Mary Virgin* (1849, Figure 142) and *Ecce Ancilla Domini!* (also known as *The Annunciation,* 1849-50, Figure 143). Although some of his sketches, such as *Faust: Gretchen and Mephistopheles in the Church* (1848, Figure 144) include grotesque elements these two paintings do not include attributes that were normally associated with the grotesque by other art critics. For example, S. H. Statham associated the grotesque with a healthy sense of English humour that broke through the monotony of beauty and the sentimentality of art.[63] Later art critics such as Kayser associated the grotesque with the estranged world, and saw it as 'an attempt to invoke and subdue the demonic aspects of the world.'[64]

The key to Ruskin's interpretation is that he saw the grotesque as symptomatic of the inevitable failure of the artist trying to represent 'an infinite power and meaning in the thing seen, beyond all that is apparent therein, giving the highest sublimity even to the most trivial object'.[65] In other words, Ruskin believed that every object when correctly seen represents the divine power of God and the artist who recognizes this and tries to represent it inevitably, but nobly, fails, as the infinite cannot be represented within the finite. Ruskin sees the early paintings of Rossetti as examples of the noble grotesque and an attempt to emulate Dante.[66] Ruskin felt that in Dante, the grotesque reached the 'most noble development' and Rossetti also admired Dante and saw his own life as following in Dante's footsteps.[67] In other words, for Ruskin the noble grotesque was a term of respect that was applied to an artist whose imagination enabled them to attempt to represent truths they 'cannot wholly grasp'.[68] Ruskin was full of admiration for Rossetti's attempt to represent the angel Gabriel as he did not adopt the common signs of an angel such as 'bird's wings at his shoulders' but simply gave him a face showing his 'youthful, but grave,

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62 Maggie Berg, 'John Ruskin's Definition of D. G. Rossetti's Art', *Victorian Poetry,* 20:3/4 (Autumn - Winter, 1982), 103-12 (p. 112).

63 S. H. Statham, 'On the Proper Limits and Functions of the Grotesque in Art', *Magazine of Art,* 4 (January, 1881), 128-32 (p. 131). The name at the end of this article is not included in the 1881 census and it could be a misprint for the well-known architect Henry (usually H.) Heathcote Statham.

64 Kayser, *The Grotesque in Art and Literature* (1981, first published 1957), p. 188.

65 Ruskin, *The Works of John Ruskin* (1903-12), V, p. 133.

66 Ruskin wrote that artists should cast their 'fancy free' and follow such masters as 'Dante and Spenser', *ibid*., p. 136.

67 *ibid*., XI, p. 187. Rossetti changed his first names from 'Gabriel Charles Dante' to 'Dante Gabriel' to symbolize his kinship and respect for Dante Alighieri (*c*. 1265-1321).

68 *ibid*., V, p. 130.

manhood.'[69] The only sign of his supernatural character are the flames at his feet that Ruskin believed were acceptable, as they could not be seen by the Virgin.

In 1862, F. W. Fairholt wrote in the *Art Journal* about 'Grotesque Design, as Exhibited in Ornamental and Industrial Art' a few years after Ruskin's analysis of the grotesque in *Modern Painters* Vol. 3.[70] Fairholt defined the grotesque more conventionally as 'anything "in the style of the grotto"', which he associated with the discoveries in the late fifteenth century of 'whimsically designed wall decorations' in the excavated 'grottoes' of ancient Roman houses. He wrote that it required 'considerable amounts of scholastic education' to see the meaning of these 'works which now excite a smile by their inherent comicality'. The reference to 'scholastic education' may be a way of dismissing Ruskin's much more nuanced view as he continued the article with examples that ranged from Egyptian art to recent decorative art. All his examples refer to distorted images of animals and human bodies that he described variously as ludicrous, whimsical, droll and absurd, for example, small jugs shaped as wide-mouthed frogs or a head piece in which 'fish, beasts, insects, and foliage combine with the human form'. He associated grotesque art not with fine art but with decorative art and he regarded it as appealing to our delight in 'child-like absurdity'. His explanation essentially dismissed grotesque art as trivial and associated with distorted and exaggerated animal and human bodies in a way that is amusing or ludicrous. Fairholt's simple description is in contrast to Ruskin's much more considered and serious view and it forms a link between the grotesqueness of Darwin's natural forms and Ruskin's spiritual interpretation.

Many of the biological forms that Darwin studied throughout his life can be viewed as grotesque in the sense of comically exaggerated or bizarre, such as the enormous penis of certain species of barnacle (*Cirripedia*, 1851-54), plants that move in *The Power of Movement in Plants* (1880), plants that eat flesh in *Insectivorous Plants* (1875), the sexuality of plants in *The Effects of Cross and Self Fertilisation in the Vegetable Kingdom* (1876) and the faecal casts of earthworms in *The Formation of Vegetable Mould, through the Action of Worms* (1881). If we apply Ruskin's analysis to these works then they could be seen as noble although we know that Ruskin did not see them this way.[71] One important point for Ruskin was sincerity—was the artist mocking or trying to represent a truth that could not easily be encompassed within the medium? Darwin studied aspects of nature that Ruskin did not want to contemplate. His serious purpose renders them noble and, with familiarity, conventional. For Ruskin truth and

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69 *ibid*., XXXIV, p. 149, 'The Three Colours of Pre-Raphaelitism', first published 1878.

70 Fairholt, 'Grotesque Design', *Art Journal,* 3 (March, 1862), 89-92.

71 He maintained that the 'happy scholar of flowers has nothing whatever to do' with 'obscene processes and prurient apparitions', John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XXV, p. 391, 'Proserpina (1875-1886)'.

sincerity are inseparable from reverence in the representation of God's work and for Darwin it was observational accuracy and the development of general laws that were the best explanation of those observations. Therefore, although they were opposed motivationally, their work at the level of observational accuracy was aligned. However, Darwin studied all aspects of nature but Ruskin refused to consider those examples that blurred distinctions, for example by describing the sexual parts of plants. However, many other people were introduced to these new, 'grotesque' aspects of nature by Darwin. *The Formation of Vegetable Mould* outsold *Origin* in its first year and it contains three illustrations of worm castings on pp. 107 (Figure 163), 124 and 127, all engraved from photographs, which Jonathan Smith describes as 'the apex of the Darwinian grotesque: worm shit, lovingly rendered as an object of wonder.'[72]

Darwin's ideas also gave rise to a new interest in natural forms, which were combined often in grotesque ways to create fashionable objects for the home. Their grotesqueness arose from their excessive use of ornament or the inappropriate combination of natural objects combined with an element of humour, such as, Linley Sambourne's parody of fashion in *Punch* (page 108) or the creation of tableaux from stuffed animals (1851, Figure 145).[73] Leading designers, such as Christopher Dresser produced grotesque designs in the 1860s and 70s, such as *Goat Vase* (1867, Figure 146) and *Tongue Vase* (*c*.1893, Figure 147). Dresser used the biological power of the forms to energize abstract designs that were on the borderline between the decorative and the grotesque. These examples show a change in the way nature and beauty were perceived, not as divine creations associated with moral goodness but as physical elements that could be combined to produce attractive designs.

Although Darwin did not study human mutations, such as 'Cyclops', 'mermaid syndrome', Proteus syndrome and hermaphroditism, he did study exaggerated features, such as steatopygia. Science was regarded as able to identify human types, categorize them and deal with such abnormalities. Human mutations and the combination of human and animal features are frequently used in mythology; representations include Watts's *Minotaur* (1885, Figure 85), and Burne-Jones's *The Mermaid* (1882, Figure 148) but science becomes involved in the mythical at the point of physical bodily distortion. The combination is frequently used to show the limitations and dangers of science; for example, Icarus and Mary Shelley's monster in *Frankenstein* both die as an indirect result of their grotesque combination of unnatural parts. The grotesque is abnormal and

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[72] Smith, *Charles Darwin and Victorian Visual Culture* (2009), p. 246.

[73] Anthropomorphic taxidermy became popular following Hermann Ploucquet's stuffed animals at the Great Exhibition of 1851. Walter Potter created a 'Museum of Curiosities' that consisted of stuffed animals in tableaux. The museum was eventually broken up at auction in 2003 after the owners allegedly refused to sell it complete to Damien Hirst.

unknown and is therefore associated with the potentially dangerous and it can destabilize accepted categories and ultimately our self-identity.

The mutability of species is the essence of Darwinism and one element of the grotesque. 'Species' is an artificial human construct imposed upon a world consisting of individuals. Over time, physical attributes change and populations of similar individuals diverge, often because crossbreeding is prevented by a physical geological barrier. In the evolutionary narrative, the boundaries of the body and species themselves are mutable.[74] This stretching and distortion of the body is used by Darwin to link beauty with the grotesque through utility. In a letter to Lyell on 22 January 1865, when he was discussing George Campbell (1823-1900, 8th Duke of Argyll), he wrote: 'It may be confidently said that no tribe of plants presents such grotesque & beautiful differences which no one until lately conjectured were of any use; but now in almost every case, I have been able to shew their important service.'[75]

George Levine argues that by looking closely at Darwin's view of nature we can see that he retained his enchantment with the world despite or perhaps because of his materialism.[76] His scientific approach did not leave a valueless world but found value through the feelings he brought to his approach. This is most clearly seen in the way he deals with the grotesque, the strange and the exceptional, which both tests his theories and demonstrates his honesty. These themes illustrate a change in the way nature and beauty were perceived, not as divine creations associated with moral goodness but with mechanical reproduction, sexual attraction, seduction, deception and the grotesque. These changes were partly brought about by the individuals involved but they also reflect broader social changes. Darwin's ideas had an immediate and lasting impact on the way we see the world. Worms and their casts may be regarded as a grotesque form of life but Darwin ended his last book with the words 'It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organised creatures.'[77]

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[74] Hurley, *The Gothic Body: Sexuality, Materialism, and Degeneration at the Fin De Siecle* (1996), pp. 55-64.

[75] Darwin was writing about orchids and the utility of every aspects of the flower's form in assisting with pollination. Campbell argued that as such features had no use they must have been created 'for beauty's sake'. Letter from Charles Darwin to Charles Lyell, 'Criticises Duke of Argyll's Address', 22 January 1865, Down.

[76] George Levine, *Darwin Loves You: Natural Selection and the Re-Enchantment of the World* (Oxford: Princeton University Press, 2008), pp. 272-74.

[77] Darwin, *The Formation of Vegetable Mould, through the Action of Worms*, 1st edn (1881), p. 313.

Ferdinand Lured by Ariel

We shall see how myth, misunderstanding and deception were at the heart of Millais's 'grotesque' painting *Ferdinand Lured by Ariel* (1850, Figure 13). It represents a scene from Shakespeare's *The Tempest* when an invisible Ariel, following Prospero's instructions, sings to Ferdinand in order to confuse and deceive him.[78] Ariel has just knocked the hat off Ferdinand's head and made the sound of a crow as Ferdinand crooks his palm round his ear and says 'Where should this music be?'.

Shakespeare's play is about deception and magic and Millais uses Darwinian protective colouring to achieve one part of that trickery by suggesting that Ariel is hidden from view by his colour. Ariel is painted in light green perhaps to signify his invisibility against the green backdrop, just as the green lizard by Ferdinand's feet is camouflaged in the grass. One critic wrote:

> Another specimen, from the same brush, inspires rather laughter than disgust. A Ferdinand of most ignoble physiognomy is being lured by a pea-green monster intended for Ariel; whilst a row of sprites, such as it takes a Millais to devise, watch the operation with turquoise eyes. It would occupy more room than the thing is worth to expose the absurdity and impertinence of this work.[79]

Camouflage or what was called protective colouring or mimicry was discussed by Darwin and Alfred Wallace. Wallace proposed protective colouring as the explanation for many of the characteristics that Darwin used sexual selection to explain.[80] For example, Wallace maintained that the peacock exhibited its natural colouring but the peahen had evolved its dull brown colour to protect it by making it less visible when brooding.[81] Although the painting pre-dates this particular controversy by about ten years, the use of protective colouring in nature was well known. Millais has selected a scene of deception from a mystical Shakespearian play and has chosen an original way to represent the nymph or fairy. Rather than paint a small, idealised figure with vertical wings he has created a grotesque green figure surrounded by sprites signalling speak and hear no evil. Ariel is telling Ferdinand that his father has just died which Ariel knows is untrue as everyone from the shipwreck is safe.[82] In some ways protective colouring is a form of lie as it hides something that would otherwise be exposed.

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78 *The Arden Shakespeare Complete Works*, ed. by Richard Proudfoot, Ann Thompson, and David Scott Kastan (Walton: Thomas Nelson, 1998), p. 1076.

79 [Hardman], 'The Pictures of the Season', *Blackwood's Edinburgh Magazine,* 68:417 (July, 1850), 77-93 (p. 82).

80 For example, see Darwin, *Descent*, 1st edn (1871), II, p. 166.

81 Wallace's explanation for the dull colouring of the peahen did not take place until after Darwin's death, see Wallace, *Darwinism* (1889), Chapter 10.

82 Ariel tells Ferdinand 'Full fathom five thy father lies' and had previously told Prospero 'Not a hair perish'd', *Arden Shakespeare*, ed. by Proudfoot, Thompson, and Kastan, pp. 1074-76.

The creatures below Ariel combine the bodies and wings of bats with human-like faces, an arrangement that creates a grotesque image according to Fairholt's description and Ruskin applied the term 'grotesque' to all forms of symbolism including the 'healthful and open play of the imagination' found in Ariel.[83] Their faces are ugly according to Darwin's definition, as they contain animal-like features although in this case they are animals with human-like features. They appear to represent the motto of the three monkeys—'hear no evil, see no evil, speak no evil'—which, according to folklore literature was not documented in Western sources until 1875.[84] One article states that if the motto had arrived in England earlier then he would have suspected 'some link with the Darwinian controversy'.[85] Millais's painting predates the Darwinian controversy but not the controversy over our origins raised by *Vestiges*. The 'three monkeys' symbolism arrived in Europe from Japan in painting and netsuke but there is no indication of such an early arrival. However, there were eighteenth and nineteenth-century versions of the three monkey's symbolism in Japan (Figure 149). The Japanese symbolism is based on a pun as the word for monkey is '*saru*' and the verb suffix '*-zaru*' is a negative ending, giving *mi-zaru* (seeing not), *kika-zaru* (hearing not) and *iwa-zaru* (speaking not). An alternative derivation of the symbolism was proposed by Wolfgang Mieder based on the expression '*Audi, vide, tace, si vis vivere in pace*' ('Hear, see, and be silent if you would live in peace') first published in England in the fourteenth century.[86] It is possible that a Japanese 'three monkey' object was brought to Britain and it could have gained Millais's attention particularly if our common ancestry with the apes was being discussed because of *Vestiges*. Another possibility is simply coincidence as Millais shows eight bat-like creatures with the faces of only four visible. Of these, one is devil-like with horns and large ears, one is holding a book, another could be covering its ears but its hands are too far forward and the final one is holding up one finger to its lips indicating that speech is forbidden or unwise. So only one creature is actually imitating the three monkeys, namely 'speak no evil', and even that creature is not using the conventional Japanese three monkeys sign of the hands flat across the mouth.

Millais has made the gender of Ariel ambiguous. The gender is not clear from the play although Ariel is referred to once using the masculine pronoun. Since the Restoration, the part was played by female actors until the 1930s, after which it has been played by men and women. Ariel has the appearance of a fairy rather than a male figure but it is not a typical fairy; her grotesque appearance includes green wings that droop down and obscure her naked body, which is rounded with slim arms, small hands,

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83 Ruskin, *The Works of John Ruskin* (1903-12), v, p. 131, 'Modern Painters 3'.

84 Robert A. Georges and Michael Owen Jones, *Folkloristics: An Introduction* (Indiana: Indiana University Press, 1995), p. 143. The earliest reference in the OED is 1896.

85 A. W. Smith, 'On the Ambiguity of the Three Wise Monkeys', *Folklore,* 104:1/2 (1993), 144-50 (p. 149).

86 Georges and Jones, *Folkloristics: An Introduction* (1995), p. 142.

rounded buttocks and a smooth rounded female face. Her green hair is hacked short, like cut grass and her profile is shown at an unflattering angle with puffy eyelids and a pouting mouth. Millais's representation of Ariel as androgynous perhaps reflects the pre-Restoration requirement for a woman to be played by a man or he may have been following the nineteenth-century stage convention. In the animal kingdom, the female is typically the one that is disguised by its colouring as Ariel is in the painting.

Ferdinand is described by the *Blackwood's* critic as having a 'most ignoble physiognomy'. Millais used as a model the art critic and friend Frederic George Stephens (1828-1907) and the reviewer may have been referring to his individuality and lack of idealised features. The scumbled paint around Ariel's left arm, the disjointed aspect of Ferdinand's head, the awkward position of the hat and his unnatural left shoulder indicate that Millais may have assembled the painting from separate sketches. Ferdinand's costume is based on that of a young Italian rather than a nobleman, even though he is a prince in the play, another form of deception.[87] The perspective is foreshortened and the willow trees by the stream look as if they are just behind Ferdinand. Perspective is another form of deception used to trick the brain into thinking the scene is three-dimensional and Millais has painted the scene as if observing it through a telephoto lens so that the foreground and background are compressed together as in *Christ in the House of His Parents*. The association of nature, represented in extreme detail, with deception through the choice of subject and the references mentioned suggest a self-referential parody on the nature of painting, which is itself a form of deception.

The background is painted in minute detail and Millais wrote to Holman Hunt to tell him 'you will find it very minute, yet not near enough for nature. To paint it as it ought to be would take me a month a weed.'[88] This suggests that Millais realised the impossibility of representing the world in its minutest detail although it is still five years before he adopted a freer style with *Autumn Leaves* (1855-56, Figure 1). Ruskin discussed this problem in *The Elements of Drawing* when he wrote: 'direct imitation becomes more or less impossible' and he expressed this even more clearly in *Modern Painters* 4 when he wrote, 'WE NEVER SEE ANYTHING CLEARLY' and he used as an example the Pre-Raphaelites who are generally regarded as representing extreme clarity and detail, yet as Ruskin points out their paintings are 'full of mystery, and suggest more

[87] The costume is like the simple short, buttoned tunic of the *Jeune Italien* opposite p. 10, from 1400, No. 6, Camille Bonnard, *Costumes Historiques Des XIIIe, XIVe Et XVe Siècles* (Paris: Goupil at Vibert, 1845). The text describes the hat as like that found in the work of Giotto. There are illustrations of how noblemen dressed in the same volume.

[88] Malcolm Warner, 'John Everett Millais: Ferdinand Lured by Ariel', in *The Pre-Raphaelites*, ed. by Leslie Parris (London: Tate Gallery, 1984), pp. 74-75.

than you can see.'[89] Ruskin distinguished between two groups of painters, those who represented things distinctly and those who delighted 'in seeing only part of things rather than the whole, and in casting clouds and mist around them'.[90] Ruskin described himself as 'long a cloud-worshipper' so it is not the detail that impressed Ruskin about the work of the Pre-Raphaelites but their ability to suggest the infinite forms of nature, and he recommended comparing a genuine Pre-Raphaelite painting with someone imitating the style by representing minute detail but with no mystery.[91] In a letter to the *Times* (5 May 1854) Ruskin pointed out that Holman Hunt's *The Light of the World* (1854, Figure 150) 'represents all objects as they would appear in nature […] the false work represents them with all their details, as if seen through a microscope'.

Evolution

Watts's *Evolution* (1898-1904, Figure 14) was selected even though it lies outside the period being considered as it is one of the few painting that explicitly deals with Darwin's theory. It is significant as it shows an artist's response to the idea of evolution and one interpretation of the painting suggests that the laws of nature are profligate and merciless.

Watts was a Victorian heroic figure who attempted all his life to find new ways to represent universal themes pictorially. This grand project was started in the 1840s and he called it 'The House of Life'. His other project was to paint portraits of all the famous Victorians, a project he called 'The Hall of Fame'. During his lifetime, he was known and admired as a portrait artist although he used what he earned from portraiture to subsidize painting grand frescoes and murals, which he often produced for the cost of the materials. When he died, he quickly went out of favour and his grand allegorical paintings are still regarded as unworthy of critical interest although in recent years the book *Representations of G. F. Watts: Art Making in Victorian Culture* (2004) has enabled some significant art historical thought to be applied to his work. Watts had an interest in science and in 'Thoughts on Life', he wrote: 'The two greatest ideas man has hitherto had are gravitation and evolution. These best and most truly explain creation.'[92] However, he did not think they could explain our history and mind and he believed in progress and saw evolution as a divine law.

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[89] This sentiment, rather than 'truth to nature' represents Ruskin's view of nature and he sees the grotesque as a failed attempt to represent the unrepresentable. John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XV, pp. 90, 120, 'The Elements of Drawing'. *Ibid*., VI, pp. 75, 79-80, 'Modern Painters 4'. Capitals in the original.

[90] Ruskin, *The Works of John Ruskin* (1903-12), VI, p. 73, 'Modern Painters 4'.

[91] *ibid*., p. 75, 'Modern Painters 4'.

[92] Mary S. Watts, *George Frederic Watts: His Writings* (London: Hodder and Stoughton, 1912), p. 296.

In Watts's *Evolution* the strong triangular composition with the central female figure suggests a *Madonna della Misericordia* (Virgin of Mercy), such as that of Piero della Francesca (1444-1465, Figure 151), but the convention is reversed. Rather than a protective female figure, Watts shows a distracted figure that scans the distance while the small figures round her fight. The figures could represent humanity and the female figure an abstract symbol, such as Nature or Evolution. Trodd points out that although it is not easy to determine whether Watts was influenced by Darwin, Huxley or Spencer he refers to a 'struggle for existence' in which 'individuals, groups and nations fight to realize individual identity'.[93] Watts is said to have referred to the painting as 'Gaia' and 'The Earthmother and her Children' and described the central figure as 'the primeval mother of Conflict and of Harmony, herself uncertain of the future of her offspring'.[94] Not only does Watts represent the 'struggle for existence' but there is no indication that the process is directed or will lead to improvement. Watts invokes a mythological scene of everlasting struggle with an uncaring Earthmother and no hope of redemption of even improvement, which invokes Darwin's uncaring and directionless evolutionary process. Darwin, however, also created a 'sublime of the ordinary' from 'barnacles, sea-slugs, ants, worms and vegetable mould'.[95]

Ruskin regarded the grotesque as invoking both the ludicrous and the terrible or fearful but both needed to be balanced to avoid either comedy or horror. Watts's female figure satisfies this definition as although her ponderous figure can be seen as ludicrous, the dereliction of the children suggests neglect and the theme of uncaring nature is itself fearful. The title of the painting points to a connection with Darwin's work and the squabbling children suggest a struggle for existence from a young age in an uncaring world. Watts's alleged description of the conflicting roles of the 'primeval mother' suggests we should look for a tension rather than a resolution. The tension is between the inevitability of conflict, struggle and death and the beauty and harmony of nature, signified by the mother's faraway gaze. To this extent there is a suggestion of the sublime but at the level of the gods rather than the worms.

Watts spent his life developing an all-encompassing theory that he could represent visually. His theory is represented symbolically in all his monumental paintings from the 1840s onwards. Watts made it clear that the viewer was intended to uncover the

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93 *Victorian Culture and the Idea of the Grotesque*, ed. by Trodd, Barlow, and Amigoni, p. 20.

94 David Bindman, 'Mankind after Darwin and Nineteenth-Century Art', in *Endless Forms: Charles Darwin, Natural Science and the Visual Arts*, ed. by Diana Donald and Jane Munro (London: Yale University Press, 2009), pp. 143-66 (p. 162). In a footnote, Bindman describes the source as a personal communication from Barbara Bryant. Gaia gave birth to Uranus through parthenogenesis and then by mating with him she gave birth to all the other gods of Greek mythology.

95 Levine, *Darwin Loves You: Natural Selection and the Re-Enchantment of the World* (2008), p. 273.

symbolism and meaning of each painting. It is difficult to take any single painting and understand its meaning as all the themes interact and in his study of the artist, Chesterton makes the point that although Watts's 'House of Life' work is allegorical he never uses conventional symbols and he was representing universal ideas in new ways.[96] Watts applied the ideas of progress to cultures and saw the English at the peak of evolution, he wrote: 'the English people, are perhaps the agents of the great law—Movement, Progress, Evolution.'[97] Watts did, therefore, associate evolution with progress and so, in the painting, we should perhaps read the struggle as leading to improvement.

The strongly pyramidal composition emphasises the bulk and strength of nature and the multitude of children at the base. The number of children is a reminder of the Malthusian principle that species increase exponentially but food supply increases arithmetically with land area. Thomas Malthus (1766-1834) saw no solution to the inevitable shortage of food this would cause and little that could be done other than 'moral restraint' and the inevitable results of 'severe labour, *bad nursing of children*, great towns, excesses of all kinds, the whole train of common diseases and epidemics, wars, plague, and famine [my italics]'.[98] Watts could have been representing this passage from Malthus. Their fighting represents the fight for survival and although one child turns towards the female figure for help, it is ignored. Watts presents the fight for life as something that concerns young children so it is not presented as a noble venture but a pathetic one that affects even the youngest and helpless.

Malthus also triggered Darwin's first ideas concerning natural selection. He started reading Malthus's *Essay on the Principle of Population* of 1798 in September 1838 (as recorded in his D notebook) and although it was not until 1842 that he wrote his first 'sketch' he said the key idea had come to him in 1838.[99] Darwin also read Malthus because of his interest in the origin of morality and Watts's painting could be a comment on the morality of the size of the woman's family. Rev. Malthus's main argument was that family size should be limited but as he did not approve of contraception, he hoped to achieve this by late marriage and sexual continence, particularly by the poor.[100] On 2 October 1838 Darwin made a note that Malthus had 'shown incontinence to be a vice &

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96 'And we find this insistence on universal symbols, this rejection of all symbols that are local or temporary or topical', Chesterton, *G. F. Watts*, facsimile edn (1904), p. 34, also see Arthur Symons, *Studies in Seven Arts* (London: A. Constable, 1906), pp. 89-117 and Trodd and Brown, *Representations of G.F. Watts: Art Making in Victorian Culture* (2004), pp. 15-19 where a 'Symons's Paterian version of Watts' is advanced.

97 George Frederic Watts, 'Our Race as Pioneers', *Nineteenth Century and After: a Monthly Review,* 49:291 (May, 1901), 849-57 (p. 849).

98 Malthus, *An Essay on the Principle of Population*, 6th edn (1826), p. 15.

99 Darwin first read Malthus on 28 September 1838, Ted Benton, 'Science, Ideology and Culture: Malthus and *The Origin of Species*', in *Charles Darwin's the Origin of Species: New Interdisciplinary Essays*, ed. by David Amigoni and Jeff Wallace (Manchester: Manchester University Press, 1995), pp. 68-94 (p. 89).

100 Malthus, *An Essay on the Principle of Population*, 6th edn (1826), p. 401.

especially in the female'.[101] Watts could also be representing the consequences of such sexual incontinence. It is also possible that Watts was representing or referencing infanticide, a subject discussed by Darwin in *Descent*. Darwin referred to McLennan who claimed that female infanticide was 'customary from time immemorial amongst many of the races' but Darwin pointed out that 'barbarians' killed infants of both sexes when they found it difficult to support themselves.[102] Darwin added that where infanticide prevails, the struggle for existence will be far less severe and all the members of the tribe will have a better chance of rearing their remaining children. Watts may be symbolizing a world in which such cruelty can be seen as a virtue or at least a consequential benefit.

The Degenerate

> Neo-Darwinism in politics had produced a European catastrophe of a magnitude so appaling, and a scope so unpredictable, that as I write these lines in 1920, it is still far from certain whether our civilization will survive it.[103]

George Bernard Shaw (1856-1950) rejected Darwin, Darwinism and Neo-Darwinism for a form of what could be called Neo-Lamarckism.[104] He believed that animals evolve characteristics through willing them into existence over many generations. He explained the evolution of the eye as the result of generations of eyeless animals wanting to see.[105] This idea of progress linked to a type of universal will is described by Daniel Pick who links the various early strands that led to these consequences through the ideas of progress and degeneration, which were associated with the work of evolutionists such as Spencer, Chambers and Darwin.[106] A seminal text discussed and dismissed by Pick was Max Nordau's *Degeneration* in which Nordau blamed degenerate English painting on the influence of Pre-Raphaelites and John Ruskin.[107]

Herbert Spencer regarded the word 'progress' as inadequate as he felt it did not as strongly convey the idea of continual improvement as 'evolution'.[108] German idealists, such as Goethe, saw the universe as a 'manifestation of the divine mind' and 'nature as striving to perfect the human form' and Spencer extended this idea to all organic life.[109]

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[101] Darwin, *Old & Useless Notes*, p. 29v.
[102] John F. McLennan, *Primitive Marriage: An Inquiry into the Origin of the Form of Capture in Marriage Ceremonies* (Edinburgh: Adam and Charles Black, 1865), p. 138 and Darwin, *Descent*, 1st edn (1871), II, pp. 363-64.
[103] George Bernard Shaw, *Back to Methuselah: A Metabiological Pentateuch* (London: Constable, 1921), p. 12.
[104] *ibid*., pp. 29-31.
[105] 'If you have no eyes, and want to see, and keep trying to see, you will finally get eyes.' *ibid*., p. 27.
[106] Daniel Pick, *Faces of Degeneration: A European Disorder, C. 1848-1918* (Cambridge: Cambridge University Press, 1996, first published 1989), p. 11.
[107] *ibid*., pp. 23-24 and Nordau, *Degeneration* (1895), pp. 67-99 on Ruskin.
[108] 'The current conception of Progress […] is in great measure erroneous', Herbert Spencer, 'Progress: Its Law and Cause', *Westminster Review,* 67:132 (April, 1857), 445-85 (p. 445).
[109] Bowler, *Evolution: The History of an Idea* (2009), p. 121.

He claimed, 'It is settled beyond dispute that organic evolution consists in a change from the homogeneous to the heterogeneous' and from this he proposed that 'this law of organic evolution is the law of all evolution' which included the earth, society, commerce, literature, science and art.[110] By 'heterogeneous' he meant that over time things become more differentiated and when he comes to life he states as a fact: 'That every existing organism has been developed out of the simple into the complex, is indeed the first established truth of all'.[111] It is therefore clear that for Spencer the idea of continual development with improvement was intrinsic to all systems, both natural and man-made. This led automatically to the idea of what he called 'Dissolution': 'a destructive change as opposed to a constructive change—a change by which the definite is gradually rendered indefinite, the coherent slowly becomes incoherent, and the heterogeneous eventually lapses into comparative homogeneity'.[112]

In Notebook N, in 1837, Darwin wrote: 'In my theory there is no absolute tendency to progression, excepting from favourable circumstances!'[113] Darwin realised that variations were not determined or directed by the environment but arose randomly.[114] As a result, most variations make the organism less well fitted and they die out. An occasional variation makes the organism better fitted and those variations are the ones that spread slowly through the population. Darwin believed a new species arose from many small changes over long periods and his theory required small variations to spread through a population. However, Fleeming Jenkin, the Scottish engineer and artist, showed mathematically that a rare 'sport' (a major variation) would not spread through the population as he assumed, like Darwin, that traits are blended. This was a serious blow to Darwin's theory that was never satisfactorily overcome in Darwin's lifetime. It is now known that traits can be recessive and spread through a population without always being expressed. We also know that certain traits, like height, are the result of many genes and therefore a small variation in one of these would not necessarily be expressed by a change in the height of the offspring. Even today, there is an assumption of progress, for example, the argument that mammals are more complex than bacteria and therefore, by implication more highly developed and more highly evolved. The misunderstanding implicit in these assumptions is discussed by Stephen Jay Gould in

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[110] Spencer, *First Principles* (1862), p. 148. The second law of thermodynamics conflicts with this view as it states that there is a tendency for systems to run down, homogenize and so tend to the average over time.
[111] *ibid*., p. 152.
[112] *ibid*., p. 221.
[113] Darwin, *Notebook N: Metaphysics and Expression*, p. 47.
[114] As pointed out earlier most variations are undirected rather than mathematically random.

‘The Modal Bacter: Why Progress Does Not Rule the History of Life’, Part Four of *Life’s Grandeur*.[115]

Darwin’s theories do not require an intelligent cause and do not imply progress in the sense of externally directed improvement.[116] This idea removes not only the need for divine creation but also the special place of human beings in the world. The term ‘progress’ implies a connected series of events, like an unfolding story, and so it is analogous to the use of narrative in painting. Darwin removed from the human story the need for there to be a story. Removing the need for progress was like removing the need for a narrative element and Darwin’s theory was being discussed at the same time as the Aesthetic Movement was introducing art without such a narrative element. Most cultures have a world view that includes some form of creation myth that defines their ultimate identity and without such a story, the Victorians had been cast adrift into a sea of troubles. Some people searched for alternative world views and in a summary of the changes in British philosophy over the years 1837-67 David Masson identified a strong disposition to try to find meaning through the invention of ‘occult causes’ such as ‘Swedenborgianism and its cognate Spiritualism’.[117] Some artists, such as Rossetti and Watts were believers, and others such as Evelyn Pickering de Morgan incorporated the ideas in their art. Watts’s lifelong development of his ‘House of Life’ project can be seen as based indirectly on the search for a world view (*Weltanschauung*) based on the progress of a ‘world spirit’ (*Weltgeist*) derived from Hegel’s ideas.[118]

Theories of evolution had been discussed since classical times and as early as 1796, Darwin’s grandfather, Erasmus Darwin proposed the idea of the common descent of all living things from ‘a single living filament’.[119] In the Victorian period, evolution was

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[115] Stephen Jay Gould, *Life's Grandeur: The Spread of Excellence from Plato to Darwin* (London: Jonathan Cape, 1996), pp. 133-230. Mammals are obviously more complex than bacteria but this does not imply a general law of progress. Gould explains why using an analogy. If a drunkard starts walking along a wall and each step is taken in a random direction then most of the time she will be near the wall but occasionally she will be found far from the wall. The ‘drunkard’s walk’ is a well-known statistical model and in this case it represents undirected genetic changes. The wall represents the limit of simplicity, in other words organisms are limited in how simple they can be and variations will result over time in most organisms being simple (near the wall) but a few becoming more complex, and over a very long time a very few becoming extremely complex (a long way from the wall). Can we say that this represents progress? Certainly not in any directed sense. He also argued that the most successful life forms on earth are the bacteria as measured by the mass of their cellular material. Human bodies, for example, are 90 percent bacteria.

[116] Monod, *Chance and Necessity* (1972), p. 14 uses the term teleonomy to describe the apparent purposefulness of living organisms but their lack of a designer in contrast to the term teleology which is used to refer to design planned by an agent.

[117] David Masson, *Recent British Philosophy: A Review, with Criticisms*, 2nd edn (London: Macmillan, 1867), p. 191 and J. Oberhausen, 'Evelyn De Morgan and Spiritualism', in *Evelyn De Morgan Oil Paintings*, ed. by C. Gordon (London: De Morgan Foundation, 1996), pp. 33-52 (p. 40).

[118] Trodd and Brown, *Representations of G.F. Watts: Art Making in Victorian Culture* (2004), p. 36.

[119] Darwin, *Zoonomia* (1794), p. 498.

often interpreted within a Christian tradition that proposed, for example, the Deluge as the explanation for fossil remains that did not correspond to any living creatures. Evolution was explained by either assuming that when first created each organism contained within it the essence of all future forms or that each step along the evolutionary path required the intervention of a Creator.[120] Within this tradition, man was assumed to be a special case based on Genesis 1:26, which says 'And God said, Let us make man in our image, after our likeness'.[121] The idea of evolution as a directed story gave rise to a mental model in which each step was seen as an improvement upon the previous one. *Vestiges* summarised this as '*the various races of mankind, are simply representations of particular stages in the development of the highest or Caucasian type* [italics in original].'[122] The sequence was often represented as a linear series of species or forms progressing from left to right, sometimes with a chimpanzee at the left and modern man at the right. The idea of a sequence of gradual changes was used by illustrators to convey a wide variety of ideas, for example, Linley Sambourne used it in the *Punch Almanack for 1882* to show a worm changing first into a chimpanzee, then a man and finally Darwin himself. This trope of a linear sequence of changes was widely used to popularize Darwin's theory and it reinforced the idea that evolution represents progress or in this example satirises the idea by abbreviating the transition to the point of absurdity. A belief in progress is a cultural myth with deep roots that is associated with the 'story of mankind', a belief that we are here for a purpose, and that life is improving. In the Victorian period, such cultural myths were used to support pseudo-scientific ideas of progress, social hierarchy, racism, the treatment of women and ideas of degeneration. Rather than support this myth, Darwin's theory undermined any idea of progress as a directed story as many scientists and other thinkers realised at the time.[123]

In *Descent,* Darwin referred to the possible degeneration of civilized man because 'weak members of civilized societies propagate their kind'.[124] Darwin added that

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[120] This teleological approach is seen even today for example, P. Abramson, *A Defense of Creationism* <http://www.creationism.org/genesis.htm> [accessed 22 August 2012].

[121] *The Bible: Authorized Version*, ed. by J. Sterling (Oxford: Oxford University Press, 1954), p. 2, a theory proposed by Richard Owen, 'On the Characters, Principles of Division, and Primary Groups of the Class Mammalia', *Proceedings Linnean Society: Zoology,* 2 (1858), 1-37.

[122] Chambers, *Vestiges*, 1st edn (1844), p. 307.

[123] Some popular works, such as that of Herbert Spencer, used evolution to justify the idea of progress, see Kathleen Pyne, *On Women and Ambivalence in the Evolutionary Topos* (Nineteenth-Century Art Worldwide) <http://www.19thc-artworldwide.org/index.php/spring03/225> [accessed 22 August 2012] and Michael Leja, *Progress and Evolution at the U. S. World's Fairs 1893–1915* (Nineteenth-Century Art Worldwide) <http://www.19thc-artworldwide.org/index.php/spring03/221> [accessed 22 August 2012]. The 'blind' nature of evolution and the anti-scientific nature of 'scientific progressism' is discussed in Monod, *Chance and Necessity* (1972), pp. 32-50.

[124] Darwin, *Descent*, 1st edn (1871), II, p. 168. Darwin mentions our care of the 'imbecile, the maimed, and the sick' as well as poor laws, medical treatment and mass vaccination programmes. The most relevant primary sources are William Rathbone Greg, 'On the Failure of "Natural Selection" in the Case of Man', *Fraser's Magazine,* 78:465 (September, 1868), 353-62,

(continued on next page)

although the breeding of weak individuals would not be allowed in domestic animals it is allowed in man because of our sense of sympathy. This much is widely discussed in his biographies but it is less often mentioned that he went on to say that our instinct of sympathy is the 'noblest part of our nature' and if we neglect the weak and helpless it would create 'a certain and great present evil', a prescient prediction of the consequences of Social Darwinism.

Wheel of Fortune

The idea of progress was central to many early Victorian thinkers, such as Carlyle and Spencer but Darwin makes it clear in his notebooks that he regarded this as human hubris and that his theory was one of change and fitness, not progress. Burne-Jones's *Wheel of Fortune* (1875-1883, Figure 15) suggests a similar thing. It shows Fortune turning a large wheel in front of which are three male figures representing from the top, a slave, a king and a poet. Fortune is an intricately dressed figure with her eyes closed and her hand on the wheel. The implication of the symbolism is that Fortune turns the wheel of life randomly backwards and forwards, which results in good or bad luck to everyone whether they are king or slave. There are many versions of the painting including part of the Troy Triptych (1872-1898, Figure 152).[125] In 1871, Burne-Jones went to Rome and sketched Michelangelo's Sistine Chapel ceiling and the figure of Fortune is based on the *Delphic Sibyl* (1509, Figure 153). Elements such as hands and feet are based on Michelangelo's *Captives* (1519-1536, Figure 154) which he recorded in his sketchbook on the same trip and the *Dying Slave* in the Louvre (1513-16, Figure 155), of which he owned a small plaster copy. The version now at the Musée d'Orsay took years for Burne-Jones to complete, and was exhibited at the Grosvenor Gallery in 1883.

In Darwinian terms, the painting shows a strong woman controlling the fate of three similar looking men. If Fortune represents nature then the painting could be seen to symbolize the blind chance associated with natural selection. Natural selection is blind in the sense that although a random variation may be more or less suited to its current environment it is blind to the future. A new variation will only survive if it is of benefit to the

cited by Darwin, with a rejoinder in the *Spectator*, October 3rd and 17th 1868. It had also been discussed in the *Quarterly Journal of Science* (1869), 152, and Lawson Tait, 'Has the Law of Natural Selection by Survival of the Fittest Failed in the Case of Man?', *Dublin Quarterly Journal of Medical Science,* 47:93 (1 February, 1869), 102-13, in a footnote in E. Ray Lankester, *On Comparative Longevity in Man and the Lower Animals* (London: Macmillan, 1870), pp. 128-29, Letter from Alfred Russel Wallace to *Anthropological Review*, 'Mr. Wallace on Natural Selection Applied to Anthropology', January 186722 August 2012], Francis Galton, 'Hereditary Talent and Character', *Macmillan's Magazine,* 12:70 (August, 1865), 318-27 and Francis Galton, *Hereditary Genius: An Inquiry into Its Laws and Consequences* (London: Macmillan, 1892, first published 1869).

[125] Other versions include one now in the National Gallery of Victoria, Melbourne; one in gouache and blue grisaille, 1870, Carlisle City Art Gallery; a watercolour, 1872-74, London Borough of Hammersmith and Fulham Public Libraries as well as numerous sketches and studies.

individual not if it could be of benefit to future generations, for example, the human eye can only have evolved through minute variations if every change made the individual possessing it better fitted to its environment. However, there is a deeper link to Darwin's work, which must be approached indirectly through an understanding of the role of degeneration in late Victorian thinking.

The painting was generally well received and described as 'the most important work this year' and 'in many ways entitled to rank with the best'. However, most reviewers added caveats that were concerned with its allegorical content, which prevented them judging it as a painting. Harry Quilter (1851-1907) described it not as a picture 'in the ordinary sense of the word' but as a 'decorative composition' and Ruskin in his lecture, 'Burne-Jones and the "Mythic School"' described the problem even more directly when he said it was 'rather beyond his sphere' as 'it was his business to tell them how such and such a thing or person *must* be painted in accordance with natural and visible law'.[126] He described the painting as strange and quaint although he thought this was 'not only excusable but desirable' in a representation of something that was 'neither body nor spirit nor animal nor vegetable, but only an idea.' The problem was that the critics did not seem to have the vocabulary to describe something that was not a representation of nature.

As Alison Smith points out there was another factor at work. In a section called 'The "Degenerate" Male: Hellenism and Medievalism' she links the distaste with the 'anatomical excess' of Hellenistic sculpture.[127] The violence and passion of Hellenistic sculpture was linked to the excessive display of anatomy. This view was expressed not just by critics but by artists such as Leighton, Watts and even Burne-Jones himself. Classical sculptures, such as the Laocoön (25BCE, Figure 156), that were previously revered were now regarded as histrionic and repellent, and early Athenian sculpture was preferred to the late, 'vulgar' Pergamon style. Anatomical excess in male figures became associated with effeminacy and degeneration. The Hellenistic tendency to show anatomy that was 'twisting and straining' in order to express exaggerated emotions became regarded as vulgar.

These concerns were all expressed about the *Wheel of Fortune*. The *Illustrated London News* regarded *The Wheel of Fortune* with 'disgust' and the morbid figures the result of their weak and 'over-wrought physique'. The figures were described as marred by the painter's solemn affectation of 'poetic melancholy', which had become

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[126] Harry Quilter, '2. Art, 1. Painting', *Contemporary Review* (August, 1883), 306-13 (p. 309) and 'Mr. Ruskin on Burne-Jones and The "Mythic School"', *Birmingham Daily Post*, 16 May 1883. Ruskin's comments suggest he was looking for ways to avoid saying what he thought about the painting as he had often written about symbolism, allegory and personification.

[127] Smith, *The Victorian Nude: Sexuality, Morality, and Art* (1996), pp. 177-82.

monotonous and used as a trick.[128] *The Magazine of Art* thought it effete and lacking originality and it pointed out that 'the Greeks were men, and did man's work' but Burne-Jones's men were effeminate.[129] Harry Quilter wrote: 'rightly or wrongly, we are apt to think of a picture as necessarily and intimately connected with natural fact, and here the violation of fact was too obvious and too crudely presented.'[130] Burne-Jones also criticized the tendency and quoted Winckelmann to support his view that Hellenistic art was decadent.[131] The representation of the male body and the criticism of effeminacy has been discussed previously (page 128) and this painting provides a further example. Burne-Jones's figures of the late 1870s were considered androgynous, effeminate, and 'supersensuous', a word that changed from a term of praise in the 1860s to a negative term meaning sexual deviancy and morbid introspection by the late 1870s.[132]

This discomfort with the move away from naturalism to symbolism was what Nordau associated with degeneration. Nordau focused all the concern that had been raised in the previous few years into the word 'degeneration', which used the credibility associated with Darwin's science to underpin an argument that mysticism in art showed that the highest values of society were being undermined from within. Darwin's theory was believed to show that the Victorians had progressed to the highest point of culture ever achieved but they believed they had to remain vigilant as the weak, the less virile and the less cultured were always with them. Biologically, if such people had more children then over time they thought they would dominate and socially, if such people started to dominate then a revolution would take place and all that represented the highest values of society would be lost. Burne-Jones's painting, for many, expressed these degenerate views with its melancholy, feebleness and unmanly figures.

The theory of degeneration was based on associating perceived problems in society with a particular social group—the 'Other'. The Other was discussed by Said in terms of the Orient but the same process applies to marginalized groups in the same society. A group seeking to obtain or maintain power identifies a specific group and emphasizes its differences, its otherness.[133] It then warns of the dangers that the marginalized group poses to society and recommends the suppression of the group. In

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[128] 'The Picture Galleries-5', *Saturday Review of Politics, Literature, Science and Art,* 55:1440 (2 June, 1883), 697-98 (p. 698).
[129] 'Pictures of the Year-3', *Magazine of Art* (January, 1879), 161-65 (p. 163).
[130] Quilter, '2. Art, 1. Painting', *Contemporary Review* (August, 1883), 306-13 (p. 309).
[131] Smith, *The Victorian Nude: Sexuality, Morality, and Art* (1996), p. 178.
[132] For example, in 'The Royal Academy and Other Exhibitions', *Blackwood's Edinburgh Magazine,* 102:621 (July, 1867), 79-98 (p. 86) it said 'It is only, indeed, by means of supersensuous and ideal treatment that a figure of Venus can be permitted to enter our Academy at all.' Nordau, *Degeneration* (1895), p. 78, applied the term negatively, to the thoughts conveyed by the devotional works that Ruskin believed were the only reason for art.
[133] Edward W. Said, *Orientalism: Western Conceptions of the Orient* (London: Penguin Books, 1995), p. 12.

this case, the pseudo-Darwinian process of degeneration was applied to a group of artists that Nordau associated with the rise of mysticism and what he called the egomaniac. Nordau linked the social to the biological by linking aspects of mysticism such as a lack of focus in Pre-Raphaelite paintings and vague thinking, with mental diseases. The lack of a clear historical period, the lack of naturalism and the expression of excessive emotion in literature and painting were also linked to mental illness. Burne-Jones was mentioned by Nordau but it was Rossetti who was singled out for criticism. However, the critical reaction to Burne-Jones indicates that his work was also thought to contain degenerate elements.

Burne-Jones's painting undermined the conventional assumption of progress that, at the time, was often associated with Darwin's ideas and it was one of the social assumptions that degeneration threatened. The idea of cycles of history rather than linear progress was not new; Herodotus wrote: 'men's fortunes are on [a] wheel which in its turning suffers not the same man to prosper forever.'[134] Nordau's theory contradicts Herodotus and the implications of Burne-Jones's painting and Darwin's ideas, although used by Nordau to support his argument could be more logically associated with the idea of cycles. What appears to be degeneration, such as the gradual loss of an animal's eyes, can in certain environments, such as a burrowing animal or cave dweller, be an increase in fitness. For example, naked mole rats have lost most of their sight as they live underground and variants that did not waste resources on producing good eyes were better fitted to the environment. What appears to be degenerate is therefore optimized to the environment and a cycle of natural forms that appears to be progressing and degenerating can be seen as optimizing the form to the local environment.

Burne-Jones was presenting a cyclical view of life rather than one of progress. Progress was associated with technological improvement and the benefits of science and he was reminding us that many events in life are determined by chance or fortune. The randomness of chance can result in misfortune falling equally on slave, king or poet. This view of the world conflicts with one of progress. Although Darwin also rejected progress, it was for very different reasons. For Darwin, the fittest at any particular time will be those most likely to survive although this is only a statistical prediction, many fit individuals can die young through misfortune.

Nature was seen to embody and support human progress and the most famous visual metaphor is perhaps the image known as the 'March of Progress'. This consists of a sequence of ape-like creatures progressing usually from left to right. At each stage, the creature is shown gradually assuming an upright pose as if the posture itself reflects an

[134] Quotation from Sophia Andres, *The Pre-Raphaelite Art of the Victorian Novel: Narrative Challenges to Visual Gendered Boundaries* (Ohio: Ohio State University Press, 2005), p. 108.

aspiration to perfection. The ultimate figure on the right is shown standing upright with no further room for improvement. A well-known version of the image was produced by Rudolph Zallinger (1919-1995) in 1965 (Figure 157). However, many Victorian engravings use a similar convention to show transmutation through gradual change (1882, Figure 17). One of the earliest is a diagram in a book by Richard Owen showing a gorilla skeleton alongside that of a man (1854, Figure 158) suggesting a hierarchy although he wrote that 'man has no physical relations with the brute kind'.[135]

The idea of progress was implicit at the Great Exhibition of 1851, which showed all the latest results of technological progress as well as the best examples of art and design. Joseph Paxton's (1803-1865) building was itself a wonder of the age and a demonstration of man's ingenuity. After the building had been moved to Sydenham Hill Benjamin Waterhouse Hawkins (1807-1889) was commissioned to design and construct a group of dinosaur sculptures (1852, Figure 159). Hawkins was advised by Richard Owen who had coined the word 'dinosauria' ('terrible lizard'). The dinosaurs were an implicit reminder of our savage past and how far we had progressed. Hawkins was then commissioned to produce the frontispiece for Huxley's *Evidence as to Man's Place in Nature* (1863, Figure 160), comparing the skeletons of various apes to that of man. This idea of 'the progress of man' illustrated as a linear sequence of animals or humans had been used the previous year by Moore for his *The Progress of Architecture* inset in his frontispiece for William Eden Nesfield's *Specimens of Medieval Architecture* (1862, Figure 161) and it was a common trope for representing linear progress.[136] Burne-Jones was undermining this widely used trope by returning to the classical idea of cycles.

The Blessed Damozel

Nordau explicitly criticized Rossetti's poem 'The Blessed Damozel' and by implication the painting *The Blessed Damozel* (1871-78, Figure 16). He thought the Pre-Raphaelites had misunderstood their vocation and they should all, like Rossetti, have gone over from a 'style of painting which was merely thought-writing, to genuine writing'.[137] This was because Nordau thought that whereas Cimabue and Giotto were painting what they believed was the literal truth, with the Pre-Raphaelite painter 'we cannot divine what he wishes particularly to tell us, and on what he wishes to direct our attention' and so he 'represents the whole field of view with the same proportion of intensity'.[138] Nordau regarded this as equivalent to the 'disconnected speech of a weak mind'. His primary

[135] Richard Owen, *The Principal Forms of the Skeleton and of the Teeth* (Philadelphia: Blanchard and Lea, 1854), p. 210, Fig. 45, 'Skeleton of the Orang (Pitheens satyrus) and Man'.
[136] Moore used a sequence (right-to-left) of older and older classical and renaissance architects, 1500BC, 500BC, 30BC and 199AD, Nesfield, *Specimens of Medieval Architecture.*
[137] Nordau, *Degeneration* (1895), p. 86.
[138] *ibid*., p. 84.

criticism was that the Pre-Raphaelites were what he called 'mystical', by which he meant weak-minded and he thought this was demonstrated by their inability to focus and their use of 'mysterious allusions and obscure symbols' which were typical of weak and diseased brains.[139] This gave rise to ahistorical settings that were vaguely medieval but not set in any particular time or place and their painting had an unnatural overall attention to detail of the type that is found in the ramblings of the weak-minded.

As we have seen, Nordau's book found a ready audience as it brought together many concerns about modern art that had been expressed in the popular press and provided a pseudo-scientific explanation based on Darwinism. For us, the term 'degenerate' is so closely linked with the horrors of Nazism that it is difficult to read Nordau's book as a simple criticism as we are so aware of where it led.

Darwin believed in fitness for purpose not progress, so by analogy an art style is fit for the purpose of the society in which it finds itself; it does not progress but evolves. We have found that certain types of 'degenerate' modern art tell us more about ourselves, not in terms of progress or degeneration but as a representation of certain social circumstances and pressures. Artists learn from previous artists in a way that is analogous to inheritance and natural selection is similar to the way styles compete until the most fashionable emerges. Each artist also reacts to his or her contemporary society in the same way that individuals are influenced by nurture as well as nature.

Nordau used 'The Blessed Damozel' to illustrate what he regarded as the characteristic peculiarities of the mystic's brain. For example, he thought the word 'damozel' evoked mysterious and obscure ideas of medieval ladies in old castles in some undefined period and the three lilies in her hand and seven stars round her head meant nothing but were put there merely to imply there was some deep meaning. He criticized Rossetti's 'dreamy states of mind' and the painting shows two figures dreaming of each other, the man below lying down half-asleep.[140] Nordau associated the dream state with weak-minded mystics who beguile hysterical readers. He criticised the fact that in the third stanza, the woman is described as having been a singer in God's choir for only one day and yet ten years have passed on Earth. If this were the case, he argued, she would be reunited in a matter of days and so she should be pleased not distressed, and this confused thinking demonstrated the 'bewildered thoughts of the mystic poet'.[141] He criticized Rossetti's lack of scientific knowledge, which he believed showed he was incapable of understanding the world around him. The painting's degeneracy, Nordau believed, comes from its dreamy, half-formed mystical associations, its pseudo-medieval

[139] *ibid*., p. 85.
[140] *ibid*., p. 87.
[141] *ibid*., p. 90.

setting, its attempt to try to tell a story, its plagiarism of Dante's ideas and its invocation of the sensual.

Walter Pater thought the poem 'The Blessed Damozel' was mystic although unlike Nordau he used the term positively.[142] He also found it both sincere and grotesque in the sense of Ruskin's noble grotesque. He wrote: 'One of the peculiarities of "The Blessed Damozel" was a definiteness of sensible imagery, which seemed almost grotesque to some, and was strange, above all, in a theme so profoundly visionary.'[143] This grotesqueness was a result of Rossetti's 'materialising of abstractions', that is, taking an abstract idea such as lost love and creating a concrete personification of the emotion.[144] This is similar to Ruskin's idea, mentioned earlier, that he admired in the early work of Rossetti, which he later thought was more evident in the work of Burne-Jones and Watts.[145] Although he first praised Rossetti, who had died the year before, he then criticized him severely when he wrote that he had 'no more actual belief' in the Old and New Testament than he had in the Morte d'Arthur.[146]

The important point is not so much Nordau's views about Rossetti and the Pre-Raphaelites but why such ideas coalesced around the Pre-Raphaelites and why readers of his book thought the way they painted and wrote was a danger to society. Nordau had extreme views, he believed the rise in degeneracy was caused not just by art but by addiction to 'alcohol, tobacco, opium, hashish, arsenic' and 'bread made with bad corn'.[147] However, the basis of his argument was the work of the Pre-Raphaelites and other artists that followed their ideas. The Pre-Raphaelites were outsiders, they were a self-defined 'brotherhood' that had been associated with radical ideas and accused of holding Catholic beliefs. Like Darwin they had been controversial and their work had unanchored society from its old certainties. Tate Britain has recently described them as the Victorian avant-garde.[148] Nordau was looking for a scapegoat for the perceived social problems of the period and he did so by constructing a convincing narrative based on semi-truths. It is surprising that Nordau was able to base a credible threat to society on a small group of artists that had been formed over forty years previously but this shows the magnitude of the changes they helped bring about.

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[142] 'One of the peculiarities of *The Blessed Damozel* was a definiteness of sensible imagery, which seemed almost grotesque to some […] naively detailed […] in the very midst of profoundly mystic vision', Pater, *Appreciations, with an Essay on Style* (1889), p. 230.
[143] *ibid*.
[144] *ibid*., p. 232.
[145] Ruskin, *The Works of John Ruskin* (1903-12), XXXIII, pp. 287-305, 'The Art of England', 'Mythic Schools of Painting: E. Burne-Jones and G. F. Watts'.
[146] *ibid*., p. 271, 'The Art of England', 'Realistic Schools of Painting: D. G. Rossetti and W. Holman Hunt'.
[147] Nordau, *Degeneration* (1895), p. 34, 35-7, 41.
[148] 'Pre-Raphaelites: Victorian Avant-Garde', Tate Britain Exhibition, 12 September 2012 to 13 January 2013.

Nordau associated 'mystical thoughts' with the mental diseases and weaknesses he found in 'epilepsy and in hysterical delirium' and he believed that 'there is no human phenomenon in the arts and poetry of the century with whom this characteristic of the mystic so completely agrees as with the originators and supporters of the Pre-Raphaelite movement in England.'[149] He also thought that later in the century 'pre-Raphaelitism in England degenerated into "aestheticism," and in France into "symbolism."'[150] He concluded with the belief that society will overcome *fin-de-siècle* degeneration 'because humanity has not yet reached the terms of its evolution'.[151] Extreme degenerates will become sterile and humanity will end the twentieth century being active yet at ease; such individuals will be 'constantly called to the telephone […] thinking simultaneously of the five continents […] live half their time in […] a flying machine and […] satisfy the demands of a circle of ten thousand acquaintances, associates and friends.'[152]

Darwin's views about progress were described in the previous section but many disagreed and saw the danger of a collapse in morality and social order. By the end of the nineteenth century, concern had moved from the identification of the degenerate individual, as proposed by Cesare Lombroso (1835-1909), to the fear of the mob, or lower classes, because increasing wealth and improved medical knowledge meant that the 'unfit' were able to survive and breed.

Nordau believed the Pre-Raphaelites followed the masters that came before Raphael because they required little skill to copy whereas copying Raphael required 'drawing and painting to perfection', which they did not have the skill to do. He then picked up the apparent inconsistency in Ruskin's writing, that he both states that the painter should never modify God's works even in the slightest but at the same time the artist should recognize and reproduce the 'ideal form of every herb, flower, and tree […] to which every individual of the species has a tendency to attain, freed from the influence of accident or disease'.[153] This apparent contradiction runs throughout Ruskin's work and is explained by the fact that he first wanted the artist to be able to produce an exact representation of nature before using their imagination to represent the ideal form. This is explained step-by-step in Ruskin's *The Elements of Drawing*.[154] Nordau, however, used what he presented as an inconsistency to demonstrate what he claimed was Ruskin's weak mindedness.

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149 Nordau, *Degeneration* (1895), p. 45, 69.
150 *ibid*., p. 99.
151 *ibid*., p. 540.
152 *ibid*., p. 541. Nordau provides a surprisingly accurate description of life at the end of the twentieth century.
153 Ruskin, *The Works of John Ruskin* (1903-12), III, p. 27, 'Modern Painters 1', 'Preface to the Second Edition'.
154 *ibid*., XV, pp. 25-27, 'Elements of Drawing'.

Although Nordau did not directly claim his ideas were based on those of Darwin, he did cite him as an authority. For example, he explained Mallarmé's 'atavism and degeneration' by reference to his '"long pointed faun-like ears"' and he claimed Darwin 'was the first to point out the apish character of this peculiarity'.[155] Darwin did acknowledge 'the celebrated sculptor, Mr. Woolner' as the first to draw attention to a 'little blunt point' that some people have on the inner fold of their ear and he wrote: 'we may safely conclude that it is a similar structure—a vestige of formerly pointed ears—which occasionally reappears in man.'[156] In the second edition of *Descent,* he added a copy of a photograph of the ear of the foetus of an orangutan showing its pointed ear. The photograph was sent by a German zoologist named Hinrich Nitsche (1845-1902) with a photograph of his 'really pointed' ears.[157] Nitsche sent the photograph of his ears on the condition they remain anonymous, as he did not want some people to deduce he was a close relative of a monkey. Darwin did not make the mistake, however, of associating one example of a characteristic exhibiting reversion with a general lack of mental capacity. If he did, he would have had to downgrade the mental ability of all European men because of their 'degenerate' ability to grow a beard.

The Water-Babies

Edward Linley Sambourne (1844-1910) was an important figure in linking Darwin and the visual arts in the popular imagination. I consider two illustrations and suggest ways in which they are linked—his *Punch* cartoon of Darwin in 1882 (Figure 17) and one of his illustrations for Charles Kingsley's *The Water-Babies* in 1885 (Figure 18).[158] The cartoon of Darwin has already been mentioned and it shows humans evolving from a worm with Darwin presented as the next evolutionary step beyond man. The Kingsley illustration shows the reverse, the degeneration of a human race back to ape-like creatures.

The Water-Babies was published in 1863 shortly after Darwin's *Origin* and it can be seen partly as an analysis of the consequences of his theory. Kingsley was one of the few who were sent a preview copy of *Origin* and he wrote to Darwin four days before its publication offering his support for Darwin's ideas.[159] Kingsley's book was a very popular children's story in the nineteenth and early twentieth century but has more recently been seen as racist and reactionary. It is a complex tale of the young chimneysweep, Tom, who has adventures that can be interpreted in many ways, for example as man's search

[155] Nordau, *Degeneration* (1895), p. 131. Nordau went on to claim that Lombroso had firmly established the connection between long ears and 'atavism and degeneration'.
[156] Darwin, *Descent*, 1st edn (1871), I, pp. 22-23. See page 73.
[157] Prodger, *Darwin's Camera: Art and Photography in the Theory of Evolution* (2009), pp. 139-40.
[158] Kingsley, *The Water-Babies* (1898, first published 1863, first illustrated by Sambourne 1885).
[159] Darwin sent 'eighty or so' advance copies to the 'most interesting, modern-minded men in Britain, some of whom he scarcely knew, such as Charles Kingsley and Herbert Spencer', Browne, *Charles Darwin: Power of Place* (2003), p. 86.

for redemption in a scientific age or as a moral tale to instruct children in what was regarded as acceptable behaviour. Tom falls into a river, dies and is transformed into a 'water baby'. He then engages in a series of adventures that take the form of moral instruction usually by fairies but also by Ellie, a girl he met as a chimney sweep who was drowned in the same river. His old master, Grimes, is also drowned and Tom travels to the end of the world to help him. Grimes was being punished for his evil ways and Tom reluctantly helps him find redemption by undertaking a final penance. Because Tom undertook this moral action he was returned to human form, and became a great scientist.

Sambourne drew a hundred illustrations for the book including a number with a scientific and Darwinian slant. There are many references to evolution and a number of illustrations referring to science, including one of the 'great fairy science' and another of Professors Owen and Huxley staring wide-eyed at a small water-baby in a sealed bottle.[160] The great fairy Science (Figure 162) is shown as a woman wearing a mortarboard, with pulled back hair and black-rimmed glasses, large breasts and a small waist with 'STEAM' written across her front. She is holding up the ends of her coat on which is written the names of the sciences and in her right hand, she holds a wand with a light bulb at the top with 'ELECTRICITY' written around it.[161] She could symbolise the replacement of steam by electricity over the coming years. Bernstein points out that the skirt mimics the shape and scales of a mermaid's tale and Barbara Gates notes that it shows 'the anomaly of woman as body and mind'.[162] The woman might be interpreted as the demure figure of a schoolteacher apart from her hourglass-shaped body, large breasts and protruding nipples. The shading of the bodice and the word 'steam' suggest that the body may be a steam boiler but Sambourne may have been emphasising the female sexual characteristics to show that brains and beauty can be combined. This is in contrast with the view of many men that women were not as intellectually advanced; for example, Herbert Spencer suggested that women had evolved to be slow mentally to conserve their energy for reproduction, a misapplication of the law of the Conservation of Energy.[163]

Sambourne's engraving in *Punch,* 'Man is but a Worm', illustrates the theory of gradual incremental change, starting with a worm and ending with Darwin. This ties together Darwin's theory of natural selection with his last book *The Formation of*

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[160] Kingsley, *The Water-Babies* (1898, first published 1863, first illustrated by Sambourne 1885), p. 86, 69.

[161] A cost effective incandescent lamp had been introduced by The Swan Electric Light Company in 1881.

[162] Bernstein, 'Designs after Nature', pp. 65-80 (p. 75) and *In Nature's Name: An Anthology of Women's Writing and Illustration, 1780-1930*, ed. by Barbara Gates (Chicago and London: The University of Chicago Press, 2002), p. 9.

[163] Herbert Spencer, *The Study of Sociology* (London: Henry S. King & Co., 1873), pp. 381-82.

Vegetable Mould, through the Action of Worms in a way that one can imagine he would have been pleased to see (Figure 163). The worm was, for Darwin, a key animal in the development of the landscape and Sambourne was therefore not saying, in Darwin's terms, that humans are lowly animals but that an animal as important as the worm was involved in our evolution. The sequence rises from a worm to an ape progenitor and then through apes to an ape-like man until it ends with a typical Victorian gentleman. Darwin sits, like God on his throne, looking in the opposite direction contemplating the sequence that gave rise to us all from its humble beginnings as a worm, his last object of prolonged study.

Sambourne's other illustration shows the opposite process, the degeneration of the Doasyoulikes from humans to ape. Sambourne's illustration starts with a seated man with bowed head and long hair labelled 'ALPHA'. Below him sits a man while a woman in a loincloth picks an apple. Above him is one of the 'ready roasted' pigs that cry 'Come and eat me' and to the right of the pig is a boy with laurel leaves entwined round his head playing a Jews' harp, the only occupation of the Doasyoulikes. Below the boy is a degenerate figure of an ugly man with muscular arms who has evolved to climb trees to avoid the lions. Kingsley compares the ugly men with large jaws and coarse lips to 'the poor Paddies who eat potatoes'; a racist reference to the Irish. Below the ugly man is an ape scratching its head, perhaps trying to remember how to think and below that a prostrate beast. In the centre is the fairy narrator who sits on a branch and leans back against the trunk with her arms above her head in a languorous pose and with her eyes closed in an expression of rapture.[164] In the story she shows Tom a 'wonderful waterproof book' full of colour photographs of the history of the Doasyoulikes. The fairy tells the story of how the Doasyoulikes degenerated over 3,500 years from living an idyllic life like the 'jolly old Greeks in Sicily' to a single ape who was shot by Du Chaillu (Figure 164). In the story, the fairy is Tom's moral guide and is instructing him in ways he can improve himself but in the illustration, the fairy is a sensuous female figure.

Kingsley's clear description of the process of degeneration was written at a time when the idea of degeneration had not been linked to Darwin. It was not until the British Association meeting in 1867 that Lubbock argued that primeval man lived in 'utter barbarism' and had only gradually evolved to a civilized state. Argyll replied in *Good Words* and in his next book *Primeval Man* (1869) that 'Man' was assisted by 'his Creator' and 'the indisputable facts of history prove that he has within him at all times the elements of corruption—that even in his most civilized condition, he is capable of

[164] Kingsley, *The Water-Babies* (1898, first published 1863, first illustrated by Sambourne 1885), p. 230.

degradation'.[165] Sambourne's illustration of Kingsley's description of degeneration is done with the benefit of over twenty years of debate about the subject and at a time when concern about the degeneration of English society was starting to develop. Nordau published *Degeneration* only nine years later and diagnosed, as we have seen, the tendency of degenerate artists to write 'mystic, symbolic and "decadent" works' as the sign of a diseased society.[166] The history of the idea of degeneration during the nineteenth century is complex but before Kingsley's book, one of the most important works was Richard Whately's *Introductory Lectures on Political Economy* (1832).[167] Whately believed that there had been no examples of any community emerging from 'a state of utter barbarism' and that 'savages' found today all degenerated from a previous civilized state.[168] The debate between degenerationists and progressionists was widespread in the periodical literature in the 1840s and 1850s and probably influenced Kingsley.

In the final part of the degeneration of the Doasyoulikes, they become ape-like creatures and the last representative of the race is illustrated as a wild gorilla that tries to say 'Am I not a man and a brother?' but has forgotten how to speak and is shot. Kingsley may have been referring to Josiah Wedgewood's original anti-slavery medallion (Figure 165), in which case it may have been a reference to a black person. On this basis, the book has been criticized as racist, as it implies the Doasyoulikes were black. However, Kingsley compares them to the Greeks and Sambourne illustrates them either as white or as apes so Kingsley may have been referencing the 18 May 1861 cartoon in *Punch,* which has a gorilla with a billboard round its neck saying 'Am I a Man and a Brother?' (Figure 34).

Concluding Remarks

We have seen how artists helped bring about change by questioning previously held assumptions, such as the link between ugliness and moral worth, at the same time as Darwin was defining ugliness in terms of specific physical features. Both Darwin and the artists were decoupling ugliness, and therefore beauty, from any association with morality.

Ruskin and Darwin raised questions about what we mean by the grotesque although in different ways. They both helped make the visually unacceptable, whether it

[165] George Campbell, *Primeval Man: An Examination of Some Recent Speculations* (London: Strahan & Co., 1869), pp. 198-200.
[166] Nordau, *Degeneration* (1895), p. 15.
[167] Pick, *Faces of Degeneration* (1996, first published 1989), p. 216.
[168] Richard Whately, *Introductory Lectures on Political Economy* (London: John W. Parker, 1831), p. 97.

was a Gothic carving or the excretions of an earthworm, popular through their understanding and sympathy,

Degeneracy invoked ideas of social and moral collapse and this powerful fear was used by Nordau to label certain forms of art ‘mystical’, a term he associated with contemporary ideas of mental illness. His link between what we now call modern art and what I have called an unanchoring from tradition is in some ways a valid observation but his fear that it could undermine society and turn us into ape-like beings was unfounded. The power of the link he created between art and science, or rather pseudo-science, is demonstrated by its horrendous consequences in Nazi Germany; proof that art is a powerful force for change in society.

Chapter 7: Conclusion

> It is the spectator, and not life, that art really mirrors.
> Diversity of opinion about a work of art shows that the work is new, complex, and vital.[1]

I have considered artworks about which there was a diversity of opinion and whose reception was often harshly critical, in order to understand the process of influence and change. I have found that many of the contentious issues are reflected in the works of Darwin and the leading artists and that often the artworks predate Darwin's publication, suggesting that the issue is a general social trend. However, this does not mean that Darwin or the artists were simply following those trends as they were at the forefront of bringing about change. Leaders of change select the significant ideas from existing trends and add their unique contribution, which helps promote that trend further.

I start by proposing a Darwinian theory of beauty, the central part of which is Darwin's theory of sexual selection, and use this to help with the interpretation of the style and symbolism of certain artworks. This is done in the context of the contemporary interpretation of Darwin's work and the contemporary critical reaction to the artworks. Darwin's work has had a major influence on society and cultural beliefs in the nineteenth century up to the present day; this influence is well documented and helped bring about substantial social change, so the artworks that engaged with similar issues, particularly those that predated Darwin's work, show that art was also involved in the same social changes. The influence of art on society is less well researched but the evidence of the analysis presented in this thesis shows that it also had a major influence.

When young, Darwin was well read in art history and was familiar with the well-known galleries and artworks and later in life he considered using art as a way of assisting with the analysis of human expressions. He used artists to illustrate his work and was fully engaged in ensuring that the illustrations and photographs conformed with his exacting standards. I found that Darwin was influenced by society in that the expression of his ideas showed sensitivity to the decorum of polite society and certain of his views were biased by commonly held social assumptions. However, there is little evidence that Darwin's key theoretical ideas were directly influenced by artists or that many artists read and were directly influenced by Darwin, with the exceptions noted. The artists selected were influenced by social trends and contemporary schemata in art in so far as they chose certain subjects and methods of representation. In order to understand the nature of the influence, more research is suggested regarding the way in which the

[1] Oscar Wilde, *The Complete Works of Oscar Wilde*, ed. by G. F. Maine (London: Collins, 1992), p. 17, 'The Picture of Dorian Gray' (pp. 17-167).

critical reception of the artworks changed over time. For example, Millais's *Christ in the House of His Parents* went through a major reappraisal that could help explain how society had changed and the possible influence of the painting on that change.

As mentioned in the introduction, my model for understanding change is based on Kuhnian paradigm shifts, with consideration given to Gombrich's schemata, as an explanation of changes in visual representation. Kuhn's work may not appear to be applicable as he was considering the nature of scientific revolution, and factors such as prediction, measurement and falsifiability are not relevant to social change. However, his central argument was that science is a social activity, so many of his ideas are applicable. Regarding the interpretation of artworks, Lakoff has shown that 'we think and act more or less automatically along certain lines' primarily on the basis of linguistic evidence that is metaphorical in nature.[2] Therefore, for our thinking to change it is necessary to change the metaphors we use to think. Our thinking often relies on assumptions and exemplars that are acquired in our youth and these often do not change, or change slowly over our lifetime. However, artworks, instead of putting forward an argument, raise questions that 'provide new ways of structuring our experience'.[3] Artworks can therefore help to bring about change indirectly by changing the symbols and metaphors that determine our thoughts and actions.

The examination of two widely separated social groups, scientists and artists, has helped uncover the process of cultural change. In the case of aestheticism, it revolved around the contentious nature of beauty. Beauty might seem to be an unlikely force for change from the perspective of the twenty-first century but the 'cult of beauty' in the mid to late-nineteenth century was a cultural metaphor that enabled a wide range of issues to be dealt with indirectly. This meant beauty was a significant social tool as it helped facilitate change without confronting established beliefs. Significant change to social behaviour requires a paradigm shift, that is, a change in the assumptions made by a substantial group. Each social group has a set of cultural assumptions that may be formally inconsistent but which determine their reasoning, decisions and actions.[4] The important changes are those that alter those assumptions and the metaphors on which thought is based. Kuhn's model requires a paradigm shift that is so significant that it often requires a new generation of scientist. This is because in science new theories are

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2 Lakoff, *Metaphors We Live By* (2003), pp. 3-4.

3 *ibid*., p. 235.

4 'Reason is evolutionary, in that abstract reason builds on and makes use of forms of perceptual and motor inference present in "lower" animals. The result is a Darwinism of reason, a rational Darwinism: Reason, even in its most abstract form, makes use of, rather than transcends, our animal nature', George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought* (New York, NY: Basic Books, 1999), p. 4.

complete, they are either accepted in their entirety or not at all.[5] Many social changes, however, occur through subtle and continuous change involving small modifications to the metaphorical associations on which our thought processes are based and changes to the relative importance of the various metaphors. Changes in visual representation require a change in the range and type of schemata that we use to code and decode visual scenes. We learn a range of these when young but artists can show us new ways of representing the world and, as mentioned, this provides new ways of structuring our experience.

Certain artists promoted a new world-view based on the central importance of beauty, and Darwin unanchored beauty from morality and linked it to desire. This change in the way experience was structured became an important lever for change. Rossetti used it to undermine existing assumptions about sexuality, to force us to see the world in a new way that was outside of existing categories. We have seen many examples of such changes from the undermining, or at least the questioning, of the beard as a symbol of masculinity to the questioning of the right of men to control women or for Western European powers to control the rest of the world. The pressure this put on existing assumptions can be judged by the reaction later in the century when Social Darwinism labelled many such forms of art degenerate in order to undermine their impact.

The analysis of artists and their artworks from the point of view of Darwin's theory of beauty shows that although beauty was a unifying theme, every artist reacted in a different way and produced different types of art. The Aesthetic Movement was not an artistic style or even a common cause; it was a disparate group of individuals investigating the meaning of the contentious theme of beauty. This is in contrast to the work of the Impressionists, where, although there was a wide range of styles and approaches there was also a common cause that was demonstrated by the way in which many of them worked together on a series of exhibitions dedicated to their work.[6] In England, the link was more abstract and the range of visual interpretations was as varied as the artists were. I have therefore had to consider a wide range of artists. We have seen how Rossetti dealt with the sexual aspects of beauty and the link between female power and beauty and how these were handled by Darwin. As I have explained, this does not mean that either was influenced directly by the other but it shows that these were relevant social issues. Whistler, in his Nocturne series, represented a world of dissolving forms—a change that I linked to Darwin's ideas. Millais's work, after *Autumn Leaves*,

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[5] Some theories, such as Darwin's, can be part accepted or interpreted in different ways but the broad point still applies.

[6] They did not use the term 'Impressionism' until the third exhibition of 1877. Artists came and went and only Pissarro exhibited at all eight exhibitions between 1874 and 1886. Édouard Manet (1832-1883) did not exhibit at any of them.

found beauty in the personal reaction of the artist to nature through memory. We have seen how this personal and subjective way of seeing the world was also an intriguing part of Darwin's early aesthetic reaction to nature.

Science and art can be seen as part of a series of changes involving paradigm shifts although these take place in different ways in each discipline. It is not sufficient to examine art from a scientific perspective or look at the way artists illustrated scientific ideas if these fundamental shifts are to be discovered. The cultural changes brought about by science and art independently, or apparently independently first need to be uncovered. The overlap between the two then provides a basis for understanding those cultural changes that are occurring across society. My use of a single scientist and a small number of artists over a short period suggests the conclusions might be limited to this particular case. However, I believe that further research will show that many other groups of artists and scientists brought about similar changes. My choice of the nineteenth century could also be considered a special case but significant scientific changes can also be found in the eighteenth and twentieth centuries and they were related to changes in art. Obvious examples are Einstein's theories and the development of quantum mechanics in the early part of the twentieth century in combination with the change from Post Impressionism through Cubism to Dada, or the development of the hydrogen bomb and the subsequent Cold War on the art of the fifties and sixties. Further research will show that the approach I have taken of studying one or a group of scientists and a group of artists working during the same period will give rise to many valuable connections that have previously been overlooked or treated superficially. This form of cross-disciplinary approach should play a part in art historical analysis, as it will highlight key social changes resulting from both scientific and artistic developments. Instead of regarding science and art as separate worlds, it is of value to both areas to look for the connections that bind them. Artists and scientists produce works that have a life that is independent of them and which change society in significant ways. It is important to understand how these changes take place in order to achieve a better understanding of our endeavours, what influences our approach and the effect our work has on society.

Darwin did not write specifically about beauty and art but his theory of sexual selection was an explanation for one type of beauty. An analysis of all of Darwin's work, including his unpublished notebooks, enabled me to formulate what could be called a Darwinian theory of beauty. This theory has proved useful in applying Darwin's wide range of comments and views on beauty to specific artworks. However, the theory is biased towards the aesthetics of human beauty as it is based on his theory of sexual selection. A large part of the analysis of artworks is concerned with cultural associations

and on this subject Darwin had little to say. He also had little to say on the beauty we find in certain colours, forms and sounds, what Darwin called, 'beauty in its simplest form'.[7] He associated it with symmetry, proportion and rhythm and described it as a 'very obscure subject'.[8] By dividing beauty into three distinct types he broke apart what was sometimes assumed to be a single property that could take many forms. Darwin also positioned beauty within the mind of the viewer rather than making it a property of an object and he went further and suggested, although he did not express it this way, three distinct beauty recognition mechanisms. This implies that the human body could exhibit three forms of beauty—simple beauty, through its shape and proportions, sexual beauty, through its secondary sexual characteristics and cultural beauty through its various associations in the mind of the viewer. This characterisation suggests the work of Albert Moore, an artist who combined sexual beauty with a meticulous attention to ratios and proportion within a local cultural setting.

During the 1850s and 1860s, some artists, such as Millais, moved away from the observational accuracy of the early Pre-Raphaelites to the expression of personal feelings. Nature had been an impartial, fixed source of visual pleasure to be fastidiously recorded but it became a collection of forms in flux that could only be given meaning through the intercession of the observer. Nature became a personal construct made from a set of complex phenomena governed by laws that could be discovered and understood. As we now know, when nature is examined minutely, that is at the quantum level, its stability disappears but its predictability based on human laws remains. The interaction between the observer and the observed creates a reality that is determined by both. The artist absorbs and reprocesses the world and creates his or her own meaning, which could be the nostalgia of Millais's *Autumn Leaves* or the abstract colours and shapes of Whistler's Nocturnes. Whistler and Darwin showed that nature is not a set of fixed categories and meanings but a negotiable concept whose role and meaning can change with the viewer.

The cultural role of nature changed in other ways. It went from a benign source of pleasure and beauty to a dangerous place that contained savage gorillas and wild beasts. It became negotiable as forms and meanings were in flux. Although nature was a source of beauty it contained forms bordering on the grotesque and this mirrored the fashions of the day that took nature as its source and inspiration but distorted the forms to create fantasy and fashion. Fashion reflected the Darwinian theory that beauty is itself a form of fashion carved out over thousands of generations.

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7 Darwin, *Origin*, 6th edn (1872), p. 162.
8 *ibid*.

The 1860s saw the rise of aestheticism, which raises the question of why it became so popular. Aestheticism took many forms and in fine art there was little that the artists had in common. The common thread that I have been suggesting was that it was about dealing with 'the ephemeral, the fugitive, the contingent', in a world that had become unanchored.[9] What was absolute and certain had become 'just what you like'.[10] The response of artists was to abandon conventional subjects and methods of representation and examine their personal response to the world in order to represent their emotional response or to express uncertainty through a lack of form. Without clarity of form, a picture becomes 'just what you like' but the artist could retain the beauty of colour. Artists achieved certainty through beauty as they could recognise and produce it but beauty was under attack because Darwin had undermined its association with metaphysical absolutes and suggested a mechanical explanation. However, the basis of Darwin's explanation was sexual selection, which was not mechanistic but based on fickle choice. Beauty therefore became ephemeral, fugitive and contingent, like modernity itself, a conclusion that many of Darwin's opponents refused to accept but artists, such as Whistler, exploited.

The 1860s also saw an important change in the representation of the body that can be related to a new way of looking at our animal origins and the significance of secondary sexual characteristics. We have seen how Darwin's ideas and those of certain artists unanchored our relationship with the world so that what had previously been seen as a body made in God's image became another animal whose form was the contingent consequence of seemingly trivial decisions. A change in the metaphor from 'man is God-like' to 'man is animal-like' could have had some influence on the gradual acceptance of the nude as symbolic of our animal origins and sexual nature.

The roles and connotations of each gender, race and class were changing in the light of new biological facts and new social possibilities. For example, the established categories of wife, mother and daughter were confronted by the fluid world of ambiguous sexuality, female selection and the notion of an independent and wilful woman, such as the 'femme fatale'. These changes are associated predominantly with the work of female emancipationists but I have shown that social change involves subtle influences as well as direct confrontation and Darwin and some artists brought about a re-evaluation of many established categories, despite their personal, sometimes misogynistic views. It could be said that it was Darwin who first brought about the cultural change summarised as 'everything is relative', rather than Einstein. What were thought to be established descriptions and categories, such as 'beautiful' and 'black person' became problematic

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[9] Baudelaire, *The Painter of Modern Life and Other Essays* (1995, first published 1863), p. 13.
[10] A reference to Whistler's comment during the Whistler *v*. Ruskin trial, Merrill, *A Pot of Paint* (1992), p. 151.

because of Darwin's ideas. However, I have shown that cultural change does not take place through the work of a single person but often involves the influence of a wide range of groups, including, as I have shown, the work of leading artists.

My argument has been that key social changes, although previously primarily seen as resulting from political, scientific and social developments, were also influenced by the work of certain artists. Art was not just reflecting social change but helping to bring it about. I have shown that the benefit of looking at visual representation is that it provides a different perspective that highlights the prejudice and preconceived ideas associated with written arguments. The visual is more likely to raise questions than answer them, which means that it can act as a conduit between two sides of an argument. The visual can go to the heart of certain issues without taking sides, which avoids or reduces the problem that the dialectical approach often has with the difficulty of separating reason from rhetoric. The visual can also persuade and can have a strong propaganda value not through reason but through a direct claim based on our assumption of visual verisimilitude, as what we see has the appearance and force of truth. If change takes place not by reasoned argument but by an alteration in a person's assumptions and mental associations then the visual has an important role to play. It is therefore important to approach the interpretation of the visual with caution and with knowledge of the circumstances of its production and its subsequent reception. For example, the way we deal with and exploit nature is determined by our assumptions. Millais's *Autumn Leaves* immerses us in a view of nature that at first appears romantic and suggests times past and nostalgic beauty. However, the unusual formation of the figures conflicts with this simplistic interpretation and suggests not 'religious reflection' but hidden forces of beauty and death.[11] Whistler's *Symphony in White, No. 1* is another example that shows that 'nature' was a negotiable concept whose role changed rapidly. Sambourne's 'Designs after Nature' also shows that nature can be a source of humour linked to the grotesque through fashion.

Darwin's ideas and the way that artists could represent their views were influenced by established social conventions and these encouraged them to express their findings within the bounds of established protocols of respectability. There was, for example, a social need to ask questions about our origins that was partly satisfied by *Vestiges*, but by the mid-nineteenth century a scientific answer was expected; Darwin responded to this social need. He was pre-empted by Robert Chambers and others, but Darwin's answer was the one that eventually dominated as it had the greatest scientific respectability, predictive power and could be verified by close observation and experiment. There was an interest in exploring the beauty of the naked female body and

[11] Warner, *The Victorians: British Painting 1837-1901* (1996), p. 73.

artists such as Watts, Leighton and Moore helped negotiate conventions that enabled them to be represented in a socially acceptable form by creating anti-Darwinian signifiers.

Beauty has played a key role in the history of Western art and it became a central aspect of art in Britain during the second half of the nineteenth century. Dostoevsky predicted that 'beauty will save the world' but he suggested it came at a price. He said there are two types of beauty and although we do not know what he meant by this it could be the change mentioned in *The Brothers Karamazov* from the 'ideal of Madonna' to the 'ideal of Sodom'.[12] We have seen how the Madonna-like beauty shown in books of beauty became the Darwinian beauty of 'fierce desire' unanchored from previously fixed standards.[13] This change could be a metaphor for the journey from Ruskin's God-given beauty through Darwin's animal sexuality to the accusation of sodomy brought against Oscar Wilde. This journey is itself a metaphor for the journey from romanticism to modernity. There is today an active discussion of the role of beauty in art history and I hope that this thesis will play a part in furthering that debate.

In conclusion, as Thomas Kuhn pointed out with respect to science, we learn certain ways of thinking about the world when young and they form the bedrock of our assumptions for the rest of our lives. He believed that radical scientific change requires a new generation to re-examine existing paradigms. The same is true in art and in society in general. We have seen how certain artists and scientists questioned existing assumptions and through this brought about change. In science, this change is validated by observation, which has enabled the scientific endeavour to progress in terms of its ability to control the world. In art, representation and visual structure are grounded in social values and change is therefore seen as an attack on those values. Some societies resist such change and in those societies the questioning of existing assumptions is not encouraged. It is to be hoped that more societies will become increasingly open and develop the self-confidence to encourage both scientists and artists to explore new, controversial and radical ideas.

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[12] Dostoevsky's two types of beauty are discussed in the section 'Animal Fears and Fashions', page 100.

[13] Milton, *The Poetical Works of John Milton; Complete in One Volume* (1824), Book 4, p. 21, lines 508-9.

Appendix 1: Quotations from the Works of Darwin

This Appendix brings together many of the extracts concerned with visual beauty in Darwin's twenty-seven books, 256 articles, 14,500 letters, 20,000 manuscripts and various notebooks and private notes. It adds some commentary on Darwin's views but nothing that the arguments in the thesis depend upon. It does not contain excerpts from books read by Darwin but it does contain letters sent to Darwin that discuss the question of beauty. It is brought together here for the convenience of the reader so that the original sources do not have to be searched and it does not form part of the thesis.

The research approach has been to search for any discussion of beauty and related topics, such as sexual selection, but to exclude, except for a few examples, his frequent use of the word descriptively. In some documents, other searches have been made for specific authors, or for related discussion on the beautiful, or taste or aspects of sexual selection. The main searches took place on the websites darwin-online.org.uk and www.darwinproject.ac.uk and in his published correspondence (1821-1869, Volumes 1-19). Original footnotes have only been kept when they provide additional relevant information and where necessary the numbering of the original footnotes has been changed to avoid confusion. Spelling mistakes, underlining, cross through and abbreviations in the notebooks and letters are copied from the original.

The following lists his notebooks, books and pamphlets, followed by his correspondence, articles and manuscripts each in chronological order. One of his notebooks contains a list of all the books he wanted to read and those he had read but it only applies to the years 1838-60.

The author is Charles Darwin unless otherwise stated and he is referred to as 'Darwin'. His relations are referred to by their full name, for example, 'Francis Darwin'.

Darwin's Notebooks

Darwin's notebooks are listed first as they contain the most important early thoughts on beauty. Although Darwin appreciated beauty in music, artworks and natural scenery his theoretical ideas about beauty were not developed until after the *Beagle* voyage during the critical period 1836-1844. The most important source of information for the development of his theoretical ideas is his notebooks and to a lesser extent his correspondence.

Darwin's notebooks provide the background to his thinking on beauty that is absent from his theory of sexual selection which solely concerns attractiveness in the mate. He completed fifteen small notebooks during the *Beagle* voyage and they are

mostly concerned with observations and descriptions. Towards the end of the voyage, he started what is called the Red Notebook that begins to open up theoretical ideas on natural selection but not on beauty. When the red Notebook was full, he started two notebooks known as A, on geology, and B, on species. Notebook B contains some of his first thoughts on beauty. Following the completion of Notebook B, he continued with Notebooks C, D and E but about the middle of 1838, he started Notebook M and then N on metaphysics and expression.

The text and a useful analysis of the notebooks is provided by Howard E. Gruber, *Darwin on Man: A Psychological Study of Scientific Creativity* (London: Wildwood House, 1974). In Gruber's book, the notebooks are transcribed and annotated by Paul H. Barret and the following text is taken from the *Darwin Online* website sometimes modified by Barrett's transcription.

Notebook B: Transmutation of Species (1837-1838)

This notebook and the following were transcribed by Kees Rookmaaker in 2007 based on various earlier transcriptions.

> Animals have no notions of beauty, therefore instinctive feelings against other species for sexual ends, whereas man has such instincts very little.[1]

Darwin is discussing how cross-breeding could lead to the production of what were then called 'monsters' which was thought to be one possible mechanism for the production of new species. Darwin's ideas on beauty developed significantly over the next year.

> If all men were dead, then monkeys make men. — Men make angels — [2]

A well-known quotation that suggests that at this stage Darwin believed in the idea of the inevitability of progress and the perfectibility of human beings. This is significant with respect to the way in which idealization can be seen as a process of perfecting. Ruskin considered the ideal form of a limpet or an oyster and reached the conclusion that it is associated with the generic which is a form devoid of imperfections and of a size that is the 'utmost grandeur' and is '[...] above the average or mean size. And this perfection of the creature invariably involves the utmost possible degree of all those properties of beauty'.[3] Ruskin sees a connection between idealization, beauty and the average form but does not want to reduce the 'Ideal' to the 'average or mean'.

> When we talk of higher orders, we should always say intellectually higher. — But who with the face of the earth covered with the most beautiful savannahs and forests dare to say that intellectuality is only aim in this world.[4]

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1 Darwin, *Notebook B: Transmutation of Species*, p. 161.
2 *ibid*., p. 169.
3 Ruskin, *The Works of John Ruskin* (1903-12), IV, p. 168, 'Modern Painters 2'.
4 Darwin, *Notebook B: Transmutation of Species*, p. 252.

Darwin begins to question the idea of progress by trying to define what we mean by 'higher'. If this refers to the intellectual powers of humans then he points out that natural beauty has as great a claim to importance. Of course, this raises the question of who chooses the most important criterion for deciding which animals are higher and as humans control the process this is inevitably human beings. Darwin tries to avoid this circularity by appealing to a higher 'aim'.

Notebook C: Transmutation of Species (February 1838- July 1838)

> Can be said that animals no notion of beauty. When does prefer most powerful buck[5]

Darwin is speculating about what attracts females to particular males if it is not beauty. He later freely uses the word beauty in connection with all animals, even insects.

> Gould seemed to think, that widow birds replaced Birds of Paradise — if such fantastic sexual ornaments have so intimate a relation to two continents as to be explored called into existence in two continents our ignorance is indeed profound & such it appears.[6]

The widow bird, which is a weaver, inhabits South Africa while the Birds of Paradise inhabit Australia yet their 'fantastic sexual ornaments' developed independently on both continents. This suggests a powerful force that leads to such ornaments but at this stage, Darwin is still struggling to find such a mechanism.

> Is man more hairy than woman because ancestors so, or has he assumed that character, — female & young seem most like mean character the others assumed. — Daines Barrington says cock birds attract females by song do they by beauty, analogy of man if so why not[7]

Darwin wonders for the first time whether sexual attraction in birds may be the result of an appreciation of the beauty of the mate, as it is in man. He also wonders whether man's more hairy body may be because men have retained the hairy body of their ape ancestors or whether it has been specifically selected as a sexual ornament.

Notebook D: Transmutation of Species (July 1838- October 1838)

This notebook contains his often-quoted metaphor regarding wedges, which is also found in *Origin of Species* (see below). This page written on 28 September 1838 enables us to find the exact sentence in Malthus that enabled Darwin suddenly to understand clearly how the pressure of natural selection results in better-fitted individuals. The wedges are the 'adapted structure' being forced into the available resources and limited resources

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5 Charles Darwin, *Notebook C: Transmutation of Species* <http://darwin-online.org.uk/content/frameset?itemID=CUL-DAR122.-&viewtype=text&pageseq=1> [accessed 22 August 2012], p. 71e.

6 *ibid*., p. 144.

7 *ibid*., p. 178.

results in the pressure between wedges. As each wedge is driven in, it implies other wedges are forced out and it is the forms of the adapted structures that determine how effective each wedge is at being driven forward. The metaphor makes it clear that each species only benefits if others suffer.

> Population is increase at geometrical ratio in far shorter time than 25 years — yet until the one sentence of Malthus no one clearly perceived the great check amongst men. — there is spring, like food used for other purposes as wheat for making brandy. — Even a few years plenty, makes population in Men increase & an ordinary crop causes a dearth. take Europe on an average every species must have same number killed year with year by hawks, by cold &c. — even one species of hawk decreasing in number must affect instantaneously all the rest. — The final cause of all this wedging, must be to sort out proper structure, & adapt it to changes. — to do that for form, which Malthus shows is the final effect (by means however of volition) of this populousness on the energy of man. One may say there is a force like a hundred thousand wedges trying force ~~into~~ every kind of adapted structure into the gaps ~~of~~ in the oeconomy of nature, or rather forming gaps by thrusting out weaker ones.[8]

The sentence he refers to is T. R. Malthus, *Essay on the Principle of Population,* 6th edition, London 1826, vol. 1, p. 6: 'It may safely be pronounced, therefore, that the population, when unchecked, goes on doubling itself every twenty five years, or increases in a geometrical ratio.'

Notebook M: Metaphysics on Morals and Speculations on Expression

> Beauty is instinctive feeling, & thus cuts the Knot: — Sir J. Reynolds explanation may perhaps account for our acquiring the instinct one notion of beauty & negroes another; but it does not explain the feeling in any one man.[9]

Darwin's knowledge of Reynolds's *Discourses* shows that his thoughts on beauty are based on topical theories of the period. As with many of his notes, the precise meaning of the paragraph is not clear. The 'Knot' probably refers to the problem of how to account for universal beauty. Darwin's explanation is the same as Reynolds's, namely that taste, the appreciation of beauty, varies from race to race, but Darwin, unlike Reynolds, was developing an explanation of how that this might have arisen through a natural process that he later called sexual selection. Darwin is perhaps referring to Reynolds secondary beauties and local fashion when he mentions the differences between the English and 'negroes'. However, it is not clear why Darwin feels that Reynolds has not explained 'the feeling in any one man' but it could be he was thinking of acquired learning making each individual different.

> [36]Analysis of pleasures of scenery. —

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8 Charles Darwin, *Notebook D: Transmutation of Species* <http://darwin-online.org.uk/content/frameset?itemID=CUL-DAR123.-&viewtype=text&pageseq=1> [accessed 22 August 2012], p. 135e.

9 Darwin, *Notebook M*, p. 32. Reynolds, *Discourses* (1778), pp. 322-23, Discourse VII. Reynolds points out that perfect beauty is the result of 'the uniformity of sentiments among mankind' and secondary beauties proceed from 'local and temporary prejudices, fancies, fashions, or accidental connexion of ideas'.

> There is absolute pleasure independent of imagination, (as in hearing music), this probably arises from (1) harmony of colours, ~~whi~~ & their absolute beauty, (which is as real a cause as in music) from the splendour of light, especially when coloured. — that light is a beautiful object one knows from seeing artificial lights in the night. — from the mere exercise of the [37] organ of sight, which is common to every kind of view — as likewise is novelty of view even old one, every time one looks at it. — these two causes very weak. — (2^{d}) form, some forms seem instinctively beautiful as round, ovals;— then there the pleasure of perspective, which cannot be doubted if we look at buildings, even ugly ones. — the pleasure from perspective is derived in a river from seeing how the serpentine lines narrow in the distance. — & even on paper two waving *perfectly parallel* [italics are underlined in the original] lines are elegant. — [38]
>
> Again there is beauty in rhythm & symmetry, of forms — the beauty of some as Norfolk Isd [Island] fir shows this, or sea weed, &c &c — this gives beauty to a single tree, — & the leaves of the foreground either owe their beauty to absolute forms or to the repetition of similar forms as in angular leaves, — (this Rhythmical beauty is shown by Humboldt from occurrence in Mexican & Graecian to be single cause) this symmetry & rhythm applies [39] to the view as a whole. — Colour & light has very much to do, as may be known by autumn, on clear day. —
>
> 3^{d} pleasure association *warmth*, *exercise*, birds *singings*. —
>
> 4th. Pleasure of imagination, which correspond to those he awakened during music. — connection with poetry, abundance, fertility, rustic life, virtuous happiness. — recall scraps of poetry; — former thoughts, & in experienced people — recall pictures & therefore imagining pleasure [40] of imitation come into play. — the train of thoughts vary no doubt in different people., an agriculturist, in whose mind supply of food was evasive & ill defined thought would receive pleasure from thinking of the fertility. — I a geologist have ill defined notion of land covered with ocean, former animals, slow force cracking surface &c truly poetical. (V. Wordsworth about science being sufficiently habitual to become poetical) [41] the botanist might so view plants & trees. — I am sure I remember my pleasure in Kensington Gardens has often been greatly excited by looking at trees at great compound animals united by wonderful & mysterious manner. —
>
> There is much imagination in every view, if one were admiring one in India. & a tiger stalked across the plains, how ones feelings would be excited, & how the scenery would rise.
>
> Deer in Parks ditto.[10]

These six pages are quoted in full as they give the most complete account of Darwin's developing ideas of beauty up to 1838. He described what he called 'absolute beauty', which does not depend on the imagination and is intrinsic to all humans. This feeling arises from colour harmony, light, some types of forms, perspective, rhythm and symmetry. He suggested the pleasure of perspective might derive from a natural scene, such as a river receding into the distance.[11] Some forms of natural beauty are based on the repetition of certain forms and Darwin refers to Alexander Humboldt when he compares Mexican sculpture with that of Egypt, India, Greece and Italy, see Alexander Humboldt, *Political Essay on the Kingdom of New Spain, etc.*, 2 vols., translated by John

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[10] Darwin, *Notebook D: Transmutation of Species*, pp. 36-41.

[11] Some modern writers have said that this might have evolved through natural selection because of the advantage of having the ability to recognize a landscape well-stocked with food, see Chapter 1, 'Landscape and Longing', Dutton, *The Art Instinct: Beauty, Pleasure, & Human Evolution* (2009), pp. 13-28.

Black, London, 1811. In the Darwin Library (Cambridge University Library) is a copy signed, 'Charles Darwin, Buenos Ayres.'

His grandfather, Erasmus Darwin, speculated on a more sexual basis for natural beauty, in *Zoonomia*, p. 145, when he wrote: 'A Grecian temple may give us the pleasurable idea of sublimity […] [and] when any object of vision is presented to us, which by its waving or spiral lines bears any similitude to the form of the female bosom, whether it be found in a landscape with soft gradations of rising and descending surface, or in the form of some antique vases […], we feel a general glow of delight.' Darwin refers to his grandfather's book on p. 71 of the notebook (see below).

On pp. 39 and 40 Darwin describes the types of beauty that depend on a 'train of thought' that therefore will vary from person to person. Within this category are most works of art as they depend on sophisticated, learned cultural assumptions for their appreciation. This particularly applies to 'high art' that often involved a moral lesson based on a classical myth. Over the next fifty years, this was to change to an appreciation of art based on the pleasure to be derived from colour and form, without any moral lesson or the need to understand any classical, literary or historical references. This started in England in the late 1840s with the Pre-Raphaelite movement's rejection of academic conventions and their return to art based on the 'scientific' representation of nature with its coloured shadows and botanical detail. It continued in the 1860s with the rejection of the representation of any moral values and an exclusive focus on beauty.

> The extreme pleasure children show in the naughtiness of brother children shows that sympathy is based as Burke maintains on pleasure in beholding the misfortunes of others.[12]

This quotation is given to show Darwin's familiarity with Edmund Burke, *Philosophical Inquiry into the Origin of Our Ideas of the Sublime and Beautiful: with an Introductory Discourse Concerning Taste* (London, 1757). This particular reference is to Part I, Section XIV, 'The Effects of Sympathy in the Distresses of Others.'

> Why do bulls & horses, animals of different orders turn up their nostrils when excited by love? Stallion licking udders of mare strictly analogous to men's affect for womens breasts. ∴ Dr Darwin's theory probably wrong, otherwise horses would have idea of beautiful forms.[13]

Darwin is referring to his grandfather's book *Zoonomia*, p. 145: 'Our perception of beauty consists in our recognition by the sense of vision of those objects, first, which have before inspired our love by the pleasure, which they have afforded to many of our senses; as to our sense of warmth, of touch, of smell, of taste, hunger and thirst; and secondly, which bear any analogy of form to such objects.' In addition, on p. 253, he wrote: 'So universally

[12] Darwin, *Notebook D: Transmutation of Species*, p. 51.
[13] *ibid*., p. 71.

does repetition contribute to our pleasure in the fine arts, that beauty itself has been defined by some writers to consist in a due combination of uniformity and variety.' Later Darwin accepted that horses do have an idea of beautiful forms but whether this was influenced by seeking a solution that was compatible with Erasmus Darwin's ideas we cannot say. Note that many of Darwin's phrases duplicate those of Erasmus Darwin, such as '3[d] pleasure association *warmth*' compared with 'our sense of warmth' and the emphasis on the repetition of forms. The references to uniformity and repetition are reminiscent of Burke, Part 2, Section 9 'Succession and Uniformity', where Burke uses the term succession to mean continued repetition to infinity. Burke starts the section: 'Succession; which is requisite that the parts may be continued so long, and in such a direction, as by their frequent impulses on the sense to impress the imagination with, an idea of their progress beyond their actual limits' (p. 132).

Darwin is also indirectly referring to the theories of associationism that were popular in the early part of the century. These ideas ultimately reach back to Aristotle but they were made popular by David Hume and by John Locke's 'association of ideas'. Essentially associationism proposed that all ideas are connected together in the mind through experience and all ideas are based on direct, unstructured primary sensations. From these primary, immediate sensations, a complex web of ideas is created in the mind through simple rules of association. This way of thinking lies at the heart of Darwin's view of science which is based on the collection of a large number of facts (primary observations or sensations) that lead to general theories (through the association of similarities observed in the facts). The idea of finding the primary sensations was also one aspect of Impressionist painting, particularly the trope of being born blind and suddenly regaining one's sight (see Darwin's reference to Reynolds's use of this trope below). This was thought to remove all cultural associations, of the type that Darwin thought were necessary to appreciate intellectual beauty, leaving the intuitive, sensual beauty of primary, direct experience.

Notebook N: Metaphysics and Expression (1838-1839)

> I must be very cautious. Remember how Lavater ran away with new [illegible, it could be 'factors'], — Ye Gods! — says fleshy lips denote sensuality (p 192 Vol. III octav. Edit) — certainly neither a Minerva or Apollo would have them because not beautiful — is there — anything in these absurd ideas. — do they indicate mind & body retrograding to ancestral type of consciousness &c &c. — Lavater (Holcroft Translat) Vol III. p.37, quotes from Burke, who says on mimicking expression of emotions, he has felt the passions of a face & mind sympathetic with internal organs, as action of heart.[14]

Darwin wrote a great deal on expression even though he did not publish *Expression of Emotions* for another 34 years. Again, he shows his wide reading in aesthetics and an

[14] Darwin, *Notebook N: Metaphysics and Expression*, p. 10.

understanding of the arts at a theoretical and practical level. He quotes the following from John Casper Lavater, *Essays on Physiognomy; for the Promotion of the Knowledge and the Love of Mankind and translated into English by Thomas Holcroft, 2nd ed., to which are added, One Hundred Physiognomonical Rules. A Posthumous Work by Mr. Lavater, and Memoirs of the Life of the Author* by G. Gessner, 3 vols. (Vol. 3 in 2 parts), (London, Symonds & Whittingham, 1804). The book discusses many attributes associated with fleshy lips; Darwin may be referring to the passage, 'Very fleshy lips must ever have to contend with sensuality and indolence' (Lavater, *Essays on Physiognomy* (London, William Tegg, 1850 seventh edition), p. 394. Lavater has a section on 'Miscellaneous Quotations', where he quotes Burke's discussion of Tommaso Campanella (1568-1639) who, through mimicking another person's face could 'enter into the dispositions and thoughts of people as effectively as if he had been changed into the very men.' Lavater, *Essays on Physiognomy* (1850), p. 313. Note that the quotation in footnote 1 of p. 10 of Notebook N from 'Darwin Online' is incorrect; it is from Malthus *An Essay on the Principle of Population* Vol. 3, not Lavater.

> […] In Water Scotts life. Tom Purdie, (beginning of Vol V) finally says "he knew no more what was pretty & what ugly than a cow—" so it is with all uneducated. — — Old man at Cambridge observed the ignorant, merely looked at picture as works of imitation. — Hence pleasure in the beautiful, (distinct from sexual beauty) is acquired taste. — Whilst music extremely primitive. — almost like tastes of mouth & smell.[15]

The quotation is '"When I came here first," said Tom to Mrs Laidlaw, the factor's wife, "I was little better than a beast, and knew nae mair than a cow what was pretty and what was ugly."' Tom Purdie, Scott's gamekeeper, goes on to describe how he has learnt that certain aspects of the scenery, such as particular contrasts of light and shade, are what 'gentlefolks' regard as picturesque, in J. G. Lockhart, *Memoirs of the Life of Sir Walter Scott* (New York, C. S. Francis, 1857), p. 61. The full passage therefore reinforces Darwin's notes concerning how some pleasures in the beautiful are an acquired taste. He distinguishes between a pleasure in beauty that has been acquired through education and what he calls 'sexual beauty', which it can be assumed is 'extremely primitive' like 'tastes of mouth and smell'. Works of art, therefore, that appeal to both the pleasures of intellectual beauty and sexual beauty will combine two distinct biological mechanisms.

> October 27th. Consult the VII discourse by Sir J. Reynolds. — Is our idea of beauty, that which we have been most generally accustomed to: — analogous case to my idea of conscience. — deduction from this would be that a mountaineer takes born out of country yet would love mountains, & a negro, similarly treated would think [27] negress beautiful, — (male glow worm doubtless admires female, showing, no connection with male figure) — As forms change, so must idea of beauty. — (Old Graecians living amongst naked figures, & observing powers common to savages???). The existence of taste in human mind, is to me clear evidence, of the general ideas of our ancestors being impressed on us. — Surely we have taste naturally all has [28] not been acquired by education, else

[15] *ibid*., p. 19e.

> why do some children acquire it soon & why do all men agree ultimately? — We acquire many notions unconsciously, without abstracting them & reasoning on them (as justice?? as ancients did high forehead sign of exalted character???) Why may not our heredetary nature thus acquire some general notions, which are taste? [29] Real taste in mouth, according to my theory must be acquired, by certain foods being habitual—& hence become hereditary; on same principle we know many tastes become acquired during life time:—the latter correspond to fashions in ideal taste & the former to true taste.[16]

In Section 82, written on Saturday, 10 November, 1759, 'To the Idler' Reynolds describes his ideas of beauty, see Edmond Malone, *The Works of Sir Joshua Reynolds, Knight; Late president of the Royal Academy. Containing his Discourses, Idlers, a Journey to Flanders and Holland, and his Commentary on Du Fresnoy's Art of Painting*, Vol. 2 of 3 Vols. (London: T. Cadell, 1809 fourth edition), p. 235-243. Reynolds writes that the study of the Italian Masters 'will show how much their principles are founded on reason, and, at the same time, discover the origin of our ideas of beauty [...] if a man, born blind, were to recover his sight, and the most beautiful woman brought before him, he could not determine whether she was handsome or not [...] To distinguish beauty, then, implies the having seen many individuals of that species [...] a Naturalist, before he chose one as a sample [blade of grass] [...] selects as a Painter does, the most beautiful, that is, the most general form of nature. [...] it is custom alone determines our preference of the colour of the Europeans to the Ethiopians, and they, for the same reason, prefer their own colour to ours.' Darwin is disagreeing with Reynolds and arguing for common taste based on our common ancestry. His example of common foods becoming habitual '& hence become hereditary' is based on the Lamarckian theory of acquired characteristics.

> Man's intellect is not become superior to that of the Greeks (which seems opposed to progressive development) on account of dark ages.—Look at Spain now.—Man's intellect might well deteriorate.—((effects of *external* circumstances)) ((In my theory there is no absolute tendency to progression, excepting from favourable circumstance!))[17]

This is an importance dismissal of Progressionism, a doctrine that was widely held. For example, Erasmus Darwin wrote that warm-blooded animals arose from one living filament and so any one has the 'faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end!'[18]

> But why does joy & other emotion make grown up people cry. — What is emotion? At end of Burke's essay on the sublime & Beautiful there are some notes. & likewise on Wordsworth's dissertation on Poetry.[19]

Again, Darwin refers to Burke, *Philosophical Inquiry into the Origin of Our Ideas of the Sublime and Beautiful: with an Introductory Discourse Concerning Taste* (London, 1757);

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16 *ibid*., pp. 26-29.
17 *ibid*., p. 47.
18 Darwin, *Zoonomia* (1794), pp. 7,721.
19 Darwin, *Notebook N: Metaphysics and Expression*, p. 57.

Part III, Section XXVII, 'The Sublime and Beautiful Compared,' and Part IV, Section I, 'Of the Efficient Cause of the Sublime and Beautiful.'

> How does Social animal recognize & take pleasure in other animal, (especiall as in some ~~instinct~~ insects which become in imago state social) by smell or looks. but it does not know its own smell or look, & therefore there must be some instinctive feeling which is pleased by other animals smell & looks. — no doubt it may be attempted to be said that young animal learns parent smell & look so by association receives pleasure. This [108 blank] [109] will not do for insects, if this view holds good — then man, a socialist, does not know other men by smell, but by looks, hence, some obscure picture of other men. & hence idea of beauty.[20]

Darwin is reinforcing the argument that beauty must be instinctual especially in social insects, as they cannot be taught to recognize the smell or look of their companions. Man is also a social animal that recognizes other people by sight and so we must have some 'picture' of other men. If this is the case then we could also have a 'picture' of beauty that we recognize in others. Darwin does not say whether beauty is recognized in the opposite sex only or in both sexes.

Old & Useless Notes about the Moral Sense & Some Metaphysical Points (1838-1840)

These notes were packaged in a single parcel and labelled as above by Darwin. They were transcribed by Paul H. Barrett in 1974 and were corrected and added to by John van Wyhe in 2009.

> Beau ideal, refers chiefly to moral, beau desires conscience & love. — [With regard to ordinary Beau ideal. Mem. Negro, beau,— Jeffrey denies all Beau.— How does Hen determine which most beautiful cock, which best singer — Remember— avarice a compounded passion gained in life time] [21]

He is referring to Louis Aimé-Martin, *The Education of Mothers: or the Civilization of Mankind by Women*, transl. from the French by Edwin Lee. Revised from the Fourth French Edition, Whittaker & Co., London, 1842, "The type of the beautiful is immutable—eternal; it exists; for we have the consciousness and the love of it: consciousness, to incline us to seek it; love, to render us worthy of contemplating it." Chapter 11, pp. 107-8.

> Reynolds X discourse very curious as showing "the perfection of this science of abstract form" is the source of part of the highest enjoyment in mutilated statues [22]

Darwin is referring to, Joshua Reynolds, *The Literary Works of Sir Joshua Reynolds, to which is Prefixed a Memoir of the Author* by H. W. Beechy, 2 vols., Cadell, London, 1835, Vol. 2, pp. 8–9: '[…] what artist ever looked at the Torso without feeling a warmth of enthusiasm, as from the highest efforts of poetry? From whence does this proceed? What

[20] *ibid*., pp. 107-09.
[21] Darwin, *Old & Useless Notes*, p. 8.
[22] *ibid*., p. 10.

is there in this fragment that produces this effect, but the perfection of this science of abstract form? A mind elevated to the contemplation of excellence, perceives in this defaced and shattered fragment, disjecta membra poetae, the traces of superlative genius, the reliques of a work on which succeeding ages can only gaze with inadequate admiration.'

> Reynolds XIII Discourse (p. 115) a very good passage about actions & decisions being the result of sagacity, or intuition, when individual cannot give reason, though he feels he is right— it is because each decision is made up of many partial results, & the impressions are then are all remembered, when the memory or reasons are forgotten. Our happiness &c, our well-being depend upon the "habitual reason,"— This power of the mind, faintly approaches to instinct [23]

Darwin again refers to Reynolds, *Literary Works,* 1835, Vol. 2, p. 62: '… our conduct in life, as well as in the Arts, is, or ought to be, generally governed by this habitual reason: it is our happiness that we are enabled to draw on such funds. If we were obliged to enter into a theoretical deliberation on every occasion, before we act, life would be at a stand, and Art would be impracticable.'

> "Upon the whole it seems"— "that the object of /all/ art is the realizing and embodying, what never existed but in the imagination." [24]

Again Reynolds is referred to: Reynolds, *Literary Works,* 1835, Vol. 2, p. 78: 'Upon the whole, it seems to me, that the object and intention of all the Arts is to supply the natural imperfection of things, and often to gratify the mind by realising and embodying what never existed but in the imagination.'

> How strange it, that Nature should have so little to do with art (p. 128) R. compares a view taken by camera obscura &c &c
>
> — Poussin— How are my ideas of a general notion of everything applicable to the high idea /p. 131/ in Tragic acting— My idea would make the mind have mysterious & sublime ideas independent of the senses & experience (p. 11v)
>
> p. 134 a painter must not an actors or a scene in a garden.— yet both beautiful!
>
> p. 136 Says Architecture does not come under imitative art. (my view says yes. old mass of rock) or poetry my theory says yes imitating song— two primary sources, sight & hearing— [25]

Reynolds, *Literary Works,* 1835, Vol. 2, p. 73: '[...] no Art can be grafted with success on another art [...] If a Painter should endeavor to copy the theatrical pomp and parade of dress, and attitude, instead of that simplicity, which is not a greater beauty in life than it is in Painting, we should condemn such Pictures, as painted in the meanest style. [...] So, also, Gardening, as far as Gardening is an Art … is a deviation from nature [...] Architecture … applies itself, like Music (and, I believe, we may add Poetry), directly to the imagination, without the intervention of any kind of imitation.'

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[23] *ibid*., p. 11.
[24] *ibid*., p. 11b.
[25] *ibid*., p. 11bv.

Darwin is making the point that his ideas lead to the mind having ideas that are 'independent of the senses and experience' because they have been inherited. It is difficult to describe the form such ideas would take and so he describes them as 'mysterious and sublime'. Darwin's theory contradicts Locke's idea that we are born with minds that are blank slates (*tabula rasa*) but he is not proposing any inherent moral inclination, such as Thomas Hobbe's view that we are all born selfish. The implication of any inherent characteristics and inclinations is that we are not free to self-author our own mind and this has profound consequences regarding free will, our duties and responsibilities and our attitudes towards race, gender and mental disabilities.

> Edinburgh Review Vol 18 (1st article)31 on Taste /EXCELLENT/ Deficient in not explaining the possibility of handsome /ugly healthy/ young women, with good expression— statues not painted— music very good article— why flower beautiful ? can't children [26]

Archibald Alison, 'Essays on the Nature and Principles of Taste', 2 vols. (Edinburgh: 1811), 830 pp. [Review], *The Edinburgh Review, or Critical Journal*, May 1811 - Aug. 1811, Vol. 18:1–46, 1811, p. 10: 'The most beautiful object in nature, perhaps, is the countenance of a young and beautiful woman […] what we admire is not a combination of forms and colours […] but a collection of signs and tokens of those feelings and affections, which are universally recognized as the proper objects of love and sympathy.' Also p. 17: 'The forms and colours that are peculiar to [children], are not necessarily or absolutely beautiful in themselves; for in a grown person, the same forms and colours would be either ludicrous or disgusting. [...] Take, again, for example, the instance of female beauty,—and think what different and inconsistent standards would be fixed for it in the different regions of the world;—in Africa, in Asia, and in Europe;—in Tartary and in Greece;—in Lap-land, Patagonia and Circassia. If there was anything absolutely or intrinsically beautiful, in any of the forms thus distinguished, it is inconceivable that men should differ so outrageously in their conceptions of it: If beauty were a real and independent quality, it seems impossible that it should be distinctly and clearly felt by one set of persons, where another set, altogether as sensitive, could see nothing but its opposite [...] The style of dress and architecture in every nation, if not adopted from mere want of skill, or penury of materials, always appears beautiful to the natives, and somewhat monstrous and absurd to foreigners … the fact is still more striking, perhaps, in the case of Music'.

Alison is making the point that beauty is a social convention and although Darwin notes the article is excellent he goes on later to find a common cause and an explanation for its arbitrariness.

> D. Stewart on taste

[26] *ibid*., p. 14.

> The object of this essay is to show how taste is gained how it originates, & by what means it becomes an almost instantaneous perception, — Taste has been supposed by some to consist of "an exquisite susceptibility from receiving pleasures from beauties of nature & art" But as we often see people who are susceptible of pleasures from these causes who are not men of taste & the reverse of this, taste [27]

Dugald Stewart, *The Works of Dugald Stewart*, 7 vols. (Cambridge: Hilliard and Brown, 1829), Vol. 4, 'Essay Second, On the Sublime,' pp. 265–317. Darwin summarises the main points made by Stewart between pp. 18-24. Of relevance to beauty is the above and the following pages. Stewart includes taste as one of the 'intellectual processes, which, by often passing through the mind, come at length to be carried on with a rapidity that eludes all our efforts to remark it; giving to many of our judgments, which are really the result of thought and reflection, the appearance of instantaneous and intuitive perceptions. The most remarkable instance [of these] [...] are commonly called the acquired perceptions of sight' (p. 318). Also: 'The fact seems to be [...] "the mind, when once it has felt the pleasure, has little inclination to retrace the steps by which it arrived at it." It is owing to this, that Taste has been so generally ranked among our original, faculties; and that so little attention has hitherto been given to the process by which it is formed.' (p. 325) and: '[Taste] is said to consist in "a power of receiving pleasure from the beauties of nature and of art."' (p. 327).

> evidently does not consist of this, but rather in the power of discriminating & respect good from bad.
>
> And it is manifestly from this fact & the instantaneousness of the result, that the term taste is metaphorically applied to this mental power.[45] Although taste must necessarily be acquired by a long series of experiments & observations, & yet, like in vision, it becomes [28]

Stewart wrote: '"The feeling", [Voltaire] observes, "by which we distinguish beauties and defects in the arts, is prompt in its discernment, and anticipates reflection, like the sensations of the tongue and palate. Both kinds of Taste, too, enjoy, with a voluptuous satisfaction, what is good; and reject what is bad, with an emotion of disgust. Accordingly," he adds, "this metaphorical application of the word taste, is common to all known languages."' (p. 332)

> so instantaneous, that we cannot ever perceive the various operations which the mind undergoes in gaining the result. [29]
>
> Lessing's Laocoon 2d Lect— The object of art, sculpture & painting, is beauty— which he thinks is a better definition than Winklemen's, who says it is simplicity with grandeur of character.— Hence Lessing shows expression of pain cannot be respected. But what is beauty?— it is an ideal standard, by which real objects are judged: & how obtained— implanted in our bosoms— how comes it there?[30]

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[27] *ibid*., p. 20.
[28] *ibid*., p. 21.
[29] *ibid*.
[30] *ibid*., p. 22.

Gotthold Ephraim Lessing, *Laocoön. Nathan the Wise. Minna von Barnhelm*, William A. Steel, ed., (London: J. M. Dent, 1836): 'The general distinguishing excellence of the Greek masterpieces in painting and sculpture Herr Winkelmann places in a noble simplicity [...] in arrangement and in expression.[…] And if we now refer this to the Laocoön, the motive for which I am looking becomes evident. The master was striving after the highest beauty, under the given circumstances of bodily pain. This, in its full deforming violence, it was not possible to unite with that [...]. the aspect of pain excites discomfort without the beauty of the suffering subject changing this discomfort into the sweet feeling of compassion.' (p. 12-13)

> Laocoon p. 75
>
> "The beauties developed in a work of art are not approved by the eye itself, but by the imagination through the medium of the eye;" he will allow the secondary pleasure of harmonious colours &c &c surely to be added.[31]
>
> Lessings Laocoon
>
> p. 125— says new subjects are not fit for painter or sculpture, but rather subjects which we know, it is therefore the embodying of a floating idea,— as statue of beauty, is of the "beau ideal," my instinctive impression [32]

Lessing, *Laocoön*: '[The artist] remains within the narrow range of a few designs, become familiar both to him and to everybody, and directs his inventive faculty merely to changes in the already known and to new combinations of old subjects. That, too, is actually the idea which the manuals of painting connect with the word Invention [...] In fact the poet has a great advantage who treats a well-known story and familiar characters.' (p. 45).

It is clear from these pages of his discarded notebook that he read widely, carefully and deeply into aesthetic theory and was concerned with types of beauty and their causes and occurrences.

Darwin's Publications

Darwin's earliest work was a list of captured insects that was included in a book published between 1829 and 1832, and his letters to Henslow were also circulated privately but his first complete work was *The Zoology of the Voyage of H.M.S. Beagle* published between 1838 and 1842. *Zoology* was edited by Darwin and consisted of five volumes written by R. Owen (*Fossil Mammalia*), G. R. Waterhouse (*Mammalia*), J. Gould and G. R. Gray (*Birds*), L. Jenyns (*Fish*) and T. Bell (*Reptiles and Amphibia*). The *Journal of Researches*, which was not published as *The Voyage of the* Beagle until 1905, was first published as *Journal and Remarks* in 1839. The version quoted below is the third edition but published by John Murray as '10th thousand' in 1860. The book was translated into many languages, the first was German in 1844, then Danish (1870), Italian (1872),

[31] *ibid*., p. 23.
[32] *ibid*., p. 24.

Swedish (1872), French (1875), Russian (1876), Dutch (1891), Spanish (1921), and Portuguese (1997).

In 1839 Darwin had a list of twenty one questions concerning the breeding of animals printed and between 1842 and 1846 he published three books on geology; the first was his well known *The Structure and Distribution of Coral Reefs* followed by *Geological Observations on the Volcanic Islands Visited During the Voyage of* H.M.S. Beagle and *Geological Observations on South America.* The first went into three editions the last published in 1889 with a preface by his son Francis. *Coral Reefs* was published in German in 1876 and in French in 1876.

Ignoring his contributions to other books and his testimonials, the next complete book was *Living Cirripedia* in 1851 and 1854 (two volumes) and *Fossil Cirripedia* also in 1851 and 1854 (two volumes). This comprehensive work on barnacles living and extinct was the result of eight years continuous dedicated research although from his meticulous personal diaries Darwin did calculate that he had lost about two years from illness.

On 24 November 1859 the first edition of *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* was published by John Murray. This led to about 50 reviews, some anonymous and others by J. L. R. Agassiz, F. Bowen, H. G. Bronn, W. B Carpenter, J. Crawford, W. R. Church, C. G. B. Daubeny, J. W. Dawson, H. A. DuBois, J. Duns, H. Fawcett, A. Gray, H. H. Higgins, J. D. Hooker, F. W. Hutton, T. H. Huxley, W. Jardine, F. Jenkin, A. Laugel, J. R. Leifchild, J. A. Lowell, J. Morris, A. Murray, R. Owen, T. Parsons, F. J. Pictet, A. R. Wallace, S. Wilberforce and T. V. Wollaston.

Other editions followed, the second in 1860, third in 1861, fourth 1866, fifth in 1869 and the sixth in 1872. A final sixth edition with corrections was published in 1876. Foreign language translations followed first in German (1860), and then Dutch (1860), French (1862), Danish (1872), Spanish (1877), Polish (1884), Russian (1991), and Portuguese (2009).

The next book was *On the Various Contrivances by Which British and Foreign Orchids are Fertilised by Insects* in 1862 followed by a second edition in 1877 and a third 1882. The French translation was in 1870, the German in 1877 and the Italian in 1883.

In 1865 the Linnean Society published ‘On the Movements and Habits of Climbing Plants’ in its *Journal* and this was printed by John Murray in 1875 as a so called second edition, followed by what was called a final edition in 1882. A German translation followed shortly after in 1876 and a French translation in 1877.

The two-volume *The Variation of Animals and Plants under Domestication* was published in 1868 as two issues and the second edition in 1875. The French and German translations were published the same year, 1868, and the Italian in 1876 and Polish in 1888-9.

It was not until 1871 that Darwin took on the task of describing the origin of humans with the publication of *The Descent of Man, and Selection in Relation to Sex*. This was republished the same year as the seven thousand edition and the second ten thousand edition in 1874 and second fifteen thousand edition in 1882. Translations were first published in German (1871), French (1872-3), Danish (1874-5), Polish (1875-6), Spanish (1880), and Yiddish (1926).

What could be regarded as the companion volume followed the next year, 1872. *The Expression of the Emotions in Man and Animals* aimed to show that there were no human characteristics that are not found at least in some form in other animals. The second edition was not published until 1890 and was edited by Francis Darwin and the first translation was into German (1872), then Dutch (1873), Polish (1873), French (1874), and Spanish c. 1902.

In 1875, he published *Insectivorous Plants*, with a second edition in 1888 and a German translation in 1876 and a French translation in 1877. The following year, 1876, he published *The Effects of Cross and Self Fertilisation in the Vegetable Kingdom* with a second edition in 1878 and French and German translations in 1877. The next year, 1877, he again published a major work; *The Different Forms of Flowers on Plants of the Same Species* with what John Murray called the three thousand edition in 1884. The German translation was published the same year as the English, 1877, and the French in 1878, and Italian in 1884.

Darwin wrote what was called a 'Preliminary Notice' in Ernst Krause, *Life of Erasmus Darwin*, translated by W. S. Dallas in 1879. His next book was *The Power of Movement in Plants* in 1880, which was translated into German in 1881 and French in 1882.

The final complete book published in his lifetime was *The Formation of Vegetable Mould, Through the Action of Worms* in 1881. This proved very popular, the five thousand edition was later the same year, and the six thousand (corrected) the following year. The French and German translations were published in 1882.

After his death *The Life and Letters of Charles Darwin, Including an Autobiographical Chapter* was edited by Francis Darwin and published in 1887 although the version with original omissions restored was not published until 1958. A French

translation was published in 1888 and a Norwegian/Danish in 1889. The following sections examine those of the above books that have significant entries on beauty.

Beagle Diary (1831-1836)

The Beagle diaries contain 770 written pages that provide us with a day-by-day account of his journey round the world. They are the closest we can get to an on-the-spot personal record of what he was thinking and how his ideas changed and they provide an invaluable insight into his aesthetic sensibilities and the way he was overwhelmed by the natural world around him. For example, on 28 February 1832 he wrote:

> The delight one experiences in such times bewilders the mind, — if the eye attempts to follow the flight of a gaudy butter-fly, it is arrested by some strange tree or fruit; if watching an insect one forgets it in the stranger flower it is crawling over, — if turning to admire the splendour of the scenery, the individual character of the foreground fixes the attention. The mind is a chaos of delight, out of which a world of future & more quiet pleasure will arise. — I am at present fit only to read Humboldt; he like another Sun illumines everything I behold.[33]

And the following day:

> A most paradoxical mixture of sound & silence pervades the shady parts of the wood, — the noise from the insects is so loud that in the evening it can be heard even in a vessel anchored several hundred yards from the shore. — Yet within the recesses of the forest when in the midst of it a universal stillness appears to reign. — To a person fond of natural history such a day as this brings with it pleasure more acute than he ever may again experience.[34]

Journal of Researches (1839 onwards)

There are thirty two occurrences of the word 'taste', twenty of the word 'beauty' and seven of the word 'sublime' in the final 1860 edition, but none of the entries discuss beauty. The first 1839 edition titled *The Narrative of the Voyages of H.M. Ships* Adventure *and* Beagle and the 1845 and 1860 editions titled *Journal of Researches into the Natural History and Geology of the Countries Visited During the Voyage of* H.M.S. Beagle *Round the World, Under the Command of Capt. Fitz Roy R.N.,* were searched.

The book is noteworthy for Darwin's breathless flight through endless exotic scenes and arresting natural history observations. He is clearly overwhelmed by the richness and complexity of nature when he writes in the second edition of 1845:

> When quietly walking along the shady pathways, and admiring each successive view, I wished to find language to express my ideas. Epithet after epithet was found too weak to convey to those who have not visited the intertropical regions, the sensation of delight which the mind experiences. I have said that the plants in a hothouse fail to communicate a just idea of the vegetation, yet I must recur to it. The land is one great wild, untidy, luxuriant hothouse, made by Nature for herself, but taken [497] possession of by man, who has studded it with gay houses and formal gardens. How great would be the desire in every admirer of nature to

[33] Darwin, *Beagle Diary* (Darwin Online), p. 116.
[34] *ibid*., p. 117.

> behold, if such were possible, the scenery of another planet! yet to every person in Europe, it may be truly said, that at the distance of only a few degrees from his native soil, the glories of another world are opened to him. In my last walk I stopped again and again to gaze on these beauties, and endeavoured to fix in my mind for ever, an impression which at the time I knew sooner or later must fail. The form of the orange-tree, the cocoa-nut, the palm, the mango, the tree-fern, the banana, will remain clear and separate; but the thousand beauties which unite these into one perfect scene must fade away; yet they will leave, like a tale heard in childhood, a picture full of indistinct, but most beautiful figures.[35]

The book is also noteworthy for its combination of aesthetic appreciation with strict scientific observation; there are many examples, but an early example is of St. Domingo:

> The scenery of St. Domingo possesses a beauty totally unexpected, from the prevalent gloomy character of the rest of the island. The village is situated at the bottom of a valley, bounded by lofty and jagged walls of stratified lava. The black rocks afford a most striking contrast with the bright green vegetation, which follows the banks of a little stream of clear water. It happened to be a grand feast-day, and the village was full of people. On our return we overtook a party of about twenty young black girls, dressed in excellent taste; their black skins and snow-white linen being set off by coloured turbans and large shawls. As soon as we approached near, they suddenly all turned round, and covering the path with their shawls, sung with great energy a wild song, beating time with their hands upon their legs. We threw them some vintems, which were received with screams of laughter, and we left them redoubling the noise of their song.[36]
>
> One morning the view was singularly clear; the distant mountains being projected with the sharpest outline on a heavy bank of dark blue clouds. Judging from the appearance, and from similar cases in England, I supposed that the air was saturated with moisture. The fact, however, turned out quite the contrary. The hygrometer gave a difference of 29.6 degs., between the temperature of the air, and the point at which dew was precipitated.[37] This difference was nearly double that which I had observed on the previous mornings. This unusual degree of atmospheric dryness was accompanied by continual flashes of lightning. Is it not an uncommon case, thus to find a remarkable degree of aerial transparency with such a state of weather?[38]

Another example from later in the *Journal*:

> Every one has heard of the beauty of the scenery near Botofogo. The house in which I lived was seated close beneath the well-known mountain of the Corcovado. It has been remarked, with much truth, that abruptly conical hills are characteristic of the formation which Humboldt designates as gneiss-granite. Nothing can be more striking than the effect of these huge rounded masses of naked rock rising out of the most luxuriant vegetation.[39]
>
> This huge and irregularly conical mass has an elevation greater than that of Chimborazo; for, from measurements made by the officers in the Beagle, its height is no less than 23,000 feet. The Cordillera, however, viewed from this point, owe the greater part of their beauty to the atmosphere through which they are seen. When the sun was setting in the Pacific, it was admirable to watch how clearly their rugged outlines could be distinguished, yet how varied and how delicate were the shades of their colour.[40]

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35 Darwin, *Journal of Researches*, 2nd edn (1845), pp. 496-97.
36 Vintems are Portuguese coins.
37 The hygrometer may have been the Daniell's dew-point hygrometer invented in 1820. It measures the difference between the air temperature and the (lower) temperature at which dew forms.
38 Darwin, *Journal of Researches*, 2nd edn (1845), p. 4.
39 *ibid*., p. 28.
40 *ibid*., p. 253.

Darwin uses the word sublime to describe the quiet forest, night falling and mountain peaks. In this passage, he compares the beauty of the landscape of Europe with what he has seen in South America.

> Let us now look at the brighter side of the past time. The pleasure derived from beholding the scenery and the general aspect of the various countries we have visited, has decidedly been the most constant and highest source of enjoyment. It is probable that the picturesque beauty of many parts of Europe exceeds anything which we beheld. But there is a growing pleasure in comparing the character of the scenery in different countries, which to a certain degree is distinct from merely admiring its beauty. It depends chiefly on an acquaintance with the individual parts of each view: I am strongly induced to believe that, as in music, the person who understands every note will, if he also possesses a proper taste, more thoroughly enjoy the whole, so he who examines each part of a fine view, may also thoroughly comprehend the full and combined effect. Hence, a traveller should be a botanist, for in all views plants form the chief embellishment. Group masses of naked rock even in the wildest forms, and they may for a time afford a sublime spectacle, but they will soon grow monotonous. Paint them with bright and varied colours, as in Northern Chile, they will become fantastic; clothe them with vegetation, they must form a decent, if not a beautiful picture.[41]

Origin of Species (1859-1872)

All six editions of the *Origin of Species* (the full title was *On the Origin of Species By Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*) were examined and compared. All the editions were published by John Murray of London and although Darwin discussed sexual selection and beauty in the first edition, it was not until the fourth edition of 1866 that the description of beauty was increased substantially.

Origin of Species, 1st edition (1859)

There are many references that are relevant to understanding Darwin's work and his approach to nature and beauty.

Ten Thousand Sharp Wedges

This often quoted metaphor brings home the power, pain and cruelty of natural selection.

> The face of Nature may be compared to a yielding surface, with ten thousand sharp wedges packed close together and driven inwards by incessant blows, sometimes one wedge being struck, and then another with greater force.[42]

The metaphor is also found in his Notebook D (see above).

Entangled Bank

Perhaps the most famous quotation is from the end of the book.

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41 *ibid*., pp. 502-03.
42 Darwin, *Origin*, 1st edn (1859), p. 67.

> It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.[43]

The phrase 'entangled bank' also occurs on p. 74 of *Origin.* By the final Sixth edition of 1876 it has become 'tangled bank' in the final paragraph.

The seven occurrences of the word 'beauty' in the first edition are discussed below.

Unconscious Selection

Darwin's first attempt to describe how beauty came about in flowers combines the ideas of a 'process of improvement' with the 'preservation of the best' although he does not, at this stage say how the best are preserved.

> In plants the same gradual process of improvement, through the occasional preservation of the best individuals, whether or not sufficiently distinct to be ranked at their first appearance as distinct varieties, and whether or not two or more species or races have become blended together by crossing, may plainly be recognised in the increased size and beauty which we now see in the varieties of the heartsease, rose, pelargonium, dahlia, and other plants, when compared with the older varieties or with their parent-stocks.[44]

Section on Sexual Selection

This is the first occasion in *Origin* that Darwin introduces the idea of sexual selection and he begins by describing 'vigorous' males fighting for possession of the females.

> This [sexual selection] depends, not on a struggle for existence, but on a struggle between the males for possession of the females; the result is not death to the unsuccessful competitor, but few or no offspring. Sexual selection is, therefore, less rigorous than natural selection. Generally, the most vigorous males, those which are best fitted for their places in nature, will leave most progeny. But in many cases, victory will depend not on general vigour, but on having special weapons, confined to the male sex. A hornless stag or spurless cock would have a poor chance of leaving offspring.[45]

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43 *ibid*., pp. 489-90.
44 *ibid*., p. 36.
45 *ibid*., p. 88.

With birds, the selection is carried out by the female choosing the most beautiful male song or plumage.

> Amongst birds, the contest is often of a more peaceful character. All those who have attended to the subject, believe that there is the severest rivalry between the males of many species to attract by singing the females. The rock-thrush of Guiana, birds of Paradise, and some others, congregate; and successive males display their gorgeous plumage and perform strange antics before the females, which standing by as spectators, at last choose the most attractive partner.[46]

Darwin justifies the process of sexual selection by analogy with the process of selection by a breeder in the following often-quoted paragraph.

> It may appear childish to attribute any effect to such apparently weak means: I cannot here enter on the details necessary to support this view; but if man can in a short time give elegant carriage and beauty to his bantams, according to his standard of beauty, I can see no good reason to doubt that female birds, by selecting, during thousands of generations, the most melodious or beautiful males, according to their standard of beauty, might produce a marked effect. I strongly suspect that some well-known laws with respect to the plumage of male and female birds, in comparison with the plumage of the young, can be explained on the view of plumage having been chiefly modified by sexual selection, acting when the birds have come to the breeding age or during the breeding season; the modifications thus produced being inherited at corresponding ages or seasons, either by the males alone, or by the males and females; but I have not space here to enter on this subject.[47]

Extinction

The use of the term natural selection led to some confusion as it implied a selector and the obvious candidate was God. References to ‘feeble man’ reinforced this view through association with an all-powerful God although Darwin clearly intended the force of the argument to depend on ‘the long course of time’.

> Slow though the process of selection may be, if feeble man can do much by his powers of artificial selection, I can see no limit to the amount of change, to the beauty and infinite complexity of the co-adaptations between all organic beings, one with another and with their physical conditions of life, which may be effected in the long course of time by nature's power of selection.[48]

Organs of Little Importance

Darwin highlighted the fact that if beauty was created for the benefit of man it would ‘be absolutely fatal’ to his theory.

> The foregoing remarks lead me to say a few words on the protest lately made by some naturalists, against the utilitarian doctrine that every detail of structure has been produced for the good of its possessor. They believe that very many structures have been created for beauty in the eyes of man, or for mere variety. This doctrine, if true, would be absolutely fatal to my theory.[49]

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46 *ibid*., pp. 88-89.
47 *ibid*., p. 89.
48 *ibid*., p. 109.
49 *ibid*., p. 199.

Origin of Species, Second Edition (1860) and Third Edition (1861)

These editions have the same references to beauty as the first edition.

Origin of Species, Fourth Edition (1866)

There are sixteen occurrences of the word 'beauty' excluding one in the section 'Additions and Corrections' and three now in the index. The following was added to the section 'Organs of Little Importance' which was renamed 'Utilitarian Doctrine how far true: Beauty how acquired' in the fourth edition, pp. 239-241.

Darwin here made one of the major points concerning his idea of beauty, that beauty is not universal but depends on the mind of man and the idea of what is beautiful varies from culture to culture.

> With respect to the view that organic beings have been created beautiful for the delight of man,—a view which it has lately been pronounced may safely be accepted as true, and as subversive of my whole theory,—I may first remark that the idea of the beauty of any particular object obviously depends on the mind of man, irrespective of any real quality in the admired object; and that the idea is not an innate and unalterable element in the mind. We see this in men of different races admiring an entirely different standard of beauty in their women; neither the Negro nor the Chinese admires the Caucasian beau-ideal.[50]

Darwin continued by discussing the beauty in a natural scene, which he made clear, here and in his notebooks, he regarded as a cultural phenomenon.

Darwin supported his argument for beauty having been created naturally by pointing out that it would be unlikely that beauty had been designed for human beings as many beautiful objects, such as fossils and minute organisms were unlikely ever to be seen by man. He reinforced the argument by pointing out that the beauty is often due to symmetry of growth rather than design.

> The idea also of beauty in natural scenery has arisen only within modern times. On the view of beautiful objects having been created for man's gratification, it ought to be shown that there was less beauty on the face of the earth before man appeared than since he came on the stage. Were the beautiful volute and cone shells of the Eocene epoch, and the gracefully sculptured ammonites of the Secondary period, created that man might ages afterwards admire them in his cabinet? Few objects are more beautiful than the minute siliceous cases of the diatomaceæ: were these created that they might be examined and admired under the higher powers of the microscope? The beauty in this latter case, and in many others, is apparently wholly due to symmetry of growth.[51]

The beauty of flowers is a result of the need to attract insects, which is supported by the fact that only those plants that are insect pollinated have beautiful flowers. This is a result of natural selection, which is therefore one mechanism that can result in beauty.

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[50] Darwin, *Origin of Species, Fourth Edn.*, 4th edn (1866), pp. 238-39.
[51] *ibid*., p. 239.

> Flowers rank amongst the most beautiful productions of nature; and they have become through natural selection beautiful, or rather conspicuous in contrast with the greenness of the leaves, that they might be easily observed and visited by insects, so that their fertilisation might be favoured. I have come to this conclusion from finding it an invariable rule that when a flower is fertilised by the wind it never has a gaily-coloured corolla. Again, several plants habitually produce two kinds of flowers; one kind open and coloured so as to attract insects; the other closed and not coloured, destitute of nectar, and never visited by insects. We may safely conclude that, if insects had never existed on the face of the earth, the vegetation would not have been decked with beautiful flowers, but would have produced only such poor flowers as are now borne by our firs, oaks, nut and ash trees, by the grasses, by spinach, docks, and nettles.[52]

The other mechanism is sexual selection, which results in the beauty of birds and other animals. Darwin added the important point that there is a 'similar taste' for beauty across the animal kingdom, which he later argued is a result of our common ancestry. In this sense, the idea of beauty does have a universal basis.

> On the other hand, I willingly admit that a great number of male animals, as all our most gorgeous birds, certainly some fishes, perhaps some mammals, and a host of magnificently coloured butterflies and some other insects, have been rendered beautiful for beauty's sake; but this has been effected not for the delight of man, but through sexual selection, that is from the more beautiful males having been continually preferred by their less ornamented females. So it is with the music of birds. We may infer from all this that a similar taste for beautiful colours and for musical sounds runs through a large part of the animal kingdom.[53]

He generalised the point that beauty was not created for human beings by explaining that no feature could have been created exclusively for the good of another species.

> If it could be proved that any part of the structure of any one species had been formed for the exclusive good of another species, it would annihilate my theory, for such could not have been produced through natural selection. Although many statements may be found in works on natural history to this effect, I cannot find even one which seems to me of any weight. It is admitted that the rattlesnake has a poison-fang for its own defence and for the destruction of its prey; but some authors suppose that at the same time this snake is furnished with a rattle for its own injury, namely, to warn its prey to escape. I would almost as soon believe that the cat curls the end of its tail when preparing to spring, in order to warn the doomed mouse. But I have not space here to enter on this and other such cases.[54]

Recapitulation and Conclusion

Darwin summarised the ways in which beauty can arise in nature with some exceptions.

> We can understand how it is that such harmonious beauty generally prevails throughout nature. That there are exceptions according to our ideas of beauty, no one will doubt who will look at some of the venomous snakes, at some fish, and at certain hideous bats with a distorted resemblance to the human face. Sexual selection has given, generally to the males alone but sometimes to both sexes, the most brilliant and beautiful colours, as well as other ornaments, to our birds, butterflies, and a few other animals. It has rendered the voices of many male birds musical to their females, as well as to our ears. Flowers and fruit have been

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52 *ibid*., pp. 239-40.
53 *ibid*., p. 240.
54 *ibid*., p. 241.

> rendered conspicuous by gaudy colours in contrast with the green foliage, in order that the flowers might be easily seen, visited, and fertilised by insects, and the fruit have their seeds disseminated by birds. And lastly, some living objects have become beautiful through mere symmetry of growth.[55]

Origin of Species, Fifth Edition (1869)

There was no change from the fourth edition regarding the description of beauty.

Origin of Species, Sixth Edition (1872)

Darwin added the following towards the end of the Section 'Utilitarian Doctrine', p. 162 in the sixth edition. Darwin here, for the first time, defined what he meant by a sense of beauty, 'the reception of a peculiar type of pleasure from certain colours, forms and sounds'. He did not try to explain how this arose but equated it to any form of pleasure.

> How the sense of beauty in its simplest form—that is, the reception of a peculiar kind of pleasure from certain colours, forms, and sounds—was first developed in the mind of man and of the lower animals, is a very obscure subject. The same sort of difficulty is presented, if we enquire how it is that certain flavours and odours give pleasure, and others displeasure. Habit in all these cases appears to have come to a certain extent into play; but there must be some fundamental cause in the constitution of the nervous system in each species.[56]

Recapitulation and Conclusion

This paragraph was rewritten compared to the fourth edition by combining it with the argument on p. 162 above. As well as clarifying and strengthening the argument, he also made it more tentative by introducing 'to a certain extent'.

> We can to a certain extent understand how it is that there is so much beauty throughout nature: for this may be largely attributed to the agency of selection. That beauty, according to our sense of it, is not universal, must be admitted by every one who will look at some venomous snakes, at some fishes, and at certain hideous bats with a distorted resemblance to the human face. Sexual selection has given the most brilliant colours, elegant patterns, and other ornaments to the males, and sometimes to both sexes of many birds, butterflies, and other animals. With birds it has often rendered the voice of the male musical to the female, as well as to our ears. Flowers and fruit have been rendered conspicuous by brilliant colours in contrast with the green foliage, in order that the flowers may be easily seen, visited, and fertilised by insects, and the seeds disseminated by birds. How it comes that certain colours, sounds, and forms should give pleasure to man and the lower animals,—that is, how the sense of beauty in its simplest form was first acquired,—we do not know any more than how certain odours and flavours were first rendered agreeable.[57]

The Variation of Animals and Plants under Domestication

There were two English editions, the first in 1868 and the second in 1875, each of two volumes. They are of interest because Darwin included a 47-page chapter (Chapter 27,

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55 *ibid*., p. 557.
56 Darwin, *Origin*, 6th edn (1872), p. 162.
57 *ibid*., p. 414.

pp. 357-404, first edition, Vol. 2) on pangenesis, his theory of how characteristics are inherited. The chapter concluded:

> The child, strictly speaking, does not grow into the man, but includes germs which slowly and successively become developed and form the man. In the child, as well as in the adult, each part generates the same part for the next generation. Inheritance must be looked at as merely a form of growth, like the self-division of a lowly-organised unicellular plant. Reversion depends on the transmission from the forefather to his descendants of dormant gemmules, which occasionally become developed under certain known or unknown conditions. Each animal and plant may be compared to a bed of mould full of seeds, most of which soon germinate, some lie for a period dormant, whilst others perish. When we hear it said that a man carries in his constitution the seeds of an inherited disease, there is much literal truth in the expression. Finally, the power of propagation possessed by each separate cell, using the term in its largest sense, determines the reproduction, the variability, the development and renovation of each living organism. No other attempt, as far as I am aware, has been made, imperfect as this confessedly is, to connect under one point of view these several grand classes of facts. We cannot fathom the marvellous complexity of an organic being; but on the hypothesis here advanced this complexity is much increased. Each living creature must be looked at as a microcosm—a little universe, formed of a host of self-propagating organisms, inconceivably minute and as numerous as the stars in heaven.[58]

Darwin appears to have been unaware of Mendel's work on inheritance, which was published in 1866. The value of the work was not realized until about 1900 and for a period Darwinism fell out of favour until it was recognized that they were not competitive theories but Mendel's theory of inheritance was the mechanism for hereditary the Darwin's theory lacked. Darwin did own two books that mentioned Mendel's work, W. O. Focke's *Die Pflanzen-Mischlinge* (1881) and H. Hoffmann's *Untersuchungen zur Bestimmung des Werthes von Species und Varietät* (1869) but the first was lent to a colleague and the relevant pages were uncut and the other has no marginal notes on the pages referring to Mendel.

Descent of Man, and Selection in Relation to Sex

There were two editions, the first consisting of two volumes published by John Murray in 1871 and the second as a single volume in 1882. Because of the importance of this book to any consideration of beauty large section of the final part of the book on humans and sexual selection are included. Although not all these sections bear directly on a theory of beauty they do provide evidence for how Darwin viewed issues of gender and race and these do bear on what various races considered beautiful and therefore whether such attributes were considered universal.

[58] Charles Darwin, *The Variation of Animals and Plants under Domestication*, 1st edn, 2 vols (London: John Murray, 1868), II, p. 404.

Darwin Descent of Man, First Edition, First Volume, 1871

Volume 1 contains thirty-three occurrences of the word 'beauty' excluding two in the contents.

Comparison of the Mental Powers of Man and the Lower Animals

The following paragraph is quoted in full as it shows how Darwin wanted to remove all absolute distinctions between human beings and other animals. One of the distinctions he claims is false is the 'sense of beauty' and it is the commonality of humans and other animals that explains why we see beauty in another plant or animal.

> It has, I think, now been shewn that man and the higher animals, especially the Primates, have some few instincts in common. All have the same senses, intuitions and sensations—similar passions, affections, and emotions, even the more complex ones; they feel wonder and curiosity; they possess the same faculties of imitation, attention, memory, imagination, and reason, though in very different degrees. Nevertheless many authors have insisted that man is separated through his mental faculties by an impassable barrier from all the lower animals. I formerly made a collection of above a score of such aphorisms, but they are not worth giving, as their wide difference and number prove the difficulty, if not the impossibility, of the attempt. It has been asserted that man alone is capable of progressive improvement; that he alone makes use of tools or fire, domesticates other animals, possesses property, or employs language; that no other animal is self-conscious, comprehends itself, has the power of abstraction, or possesses general ideas; that man alone has a sense of beauty, is liable to caprice, has the feeling of gratitude, mystery, &c.; believes in God, or is endowed with a conscience. I will hazard a few remarks on the more important and interesting of these points.[59]

Sense of Beauty

Darwin expanded on the point that a sense of beauty is not exclusive to humans. His views have been regarded as anthropomorphic and, as he applies human attributes to nature itself, as well as plants and animals, it must be, at least partly, a literary effect.

> This sense has been declared to be peculiar to man. But when we behold male birds elaborately displaying their plumes and splendid colours before the females, whilst other birds not thus decorated make no such display, it is impossible to doubt that the females admire the beauty of their male partners. As women everywhere deck themselves with these plumes, the beauty of such ornaments cannot be disputed. The Bower-birds by tastefully ornamenting their playing-passages with gaily-coloured objects, as do certain humming-birds their nests, offer additional evidence that they possess a sense of beauty.[60]

Darwin again cannot explain pleasure but this time turns the argument on its head and uses the fact that we find pleasure in the colours and sounds of nature to show our commonality with 'the lower animals'.

> Why certain bright colours and certain sounds should excite pleasure, when in harmony, cannot, I presume, be explained any more than why certain flavours

[59] Darwin, *Descent*, 1st edn (1871), I, pp. 48-49.
[60] *ibid*., p. 63.

> and scents are agreeable; but assuredly the same colours and the same sounds are admired by us and by many of the lower animals.[61]

The following important passage first makes it clear that female beauty is not universal in humans and that he finds the ornaments and music of other races 'hideous'. He went as far as to make the tentative suggestion that the sense of beauty in such races is 'not so highly developed' as in birds but this is difficult to equate with his argument that all human races are the same species. A more likely explanation follows and that is that the appreciation of many types of beauty is unique to humans as they depend on 'cultural and complex associations'. He then separates 'civilized' humans from 'barbarian' and 'uneducated persons' and only accepts that civilized humans can admire such sights and sounds.

> The taste for the beautiful, at least as far as female beauty is concerned, is not of a special nature in the human mind; for it differs widely in the different races of man, as will hereafter be shewn, and is not quite the same even in the different nations of the same race. Judging from the hideous ornaments and the equally hideous music admired by most savages, it might be urged that their æsthetic faculty was not so highly developed as in certain animals, for instance, in birds. Obviously no animal would be capable of admiring such scenes as the heavens at night, a beautiful landscape, or refined music; but such high tastes, depending as they do on culture and complex associations, are not enjoyed by barbarians or by uneducated persons.[62]

Comparison of the Mental Powers of Man and the Lower Animals

Darwin generalises from a sense of beauty to a moral sense in animals. He quotes Immanuel Kant's *Metaphysics of Ethics* (translated by J. W. Semple, Edinburgh, 1836) even though the book does not appear in his reading list and he puts forward a mechanism to explain the moral sense based on a decision between conflicting instincts. The implication is those decisions that led to 'satisfaction' are the right one, unless the 'inward monitor' is just another name for the moral sense, in which the explanation adds nothing.

> In the same manner as various animals have some sense of beauty, though they admire widely different objects, so they might have a sense of right and wrong, though led by it to follow widely different lines of conduct. [...] For each individual would have an inward sense of possessing certain stronger or more enduring instincts, and other less strong or enduring; so that there would often be a struggle which impulse should be followed; and satisfaction or dissatisfaction would be felt, as past impressions were compared during their incessant passage through the mind. In this case an inward monitor would tell the animal that it would have been better to have followed the one impulse rather than the other. The one course ought to have been followed: the one would have been right and the other wrong; but to these terms I shall have to recur.[63]

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61 *ibid*., p. 64.
62 *ibid*.
63 *ibid*., pp. 73-74.

Summary of the Last Two Chapters

Darwin emphasised the great different between the apes and humans including the impossibility of admiring ‘a grand natural scene’ but the basic sense of beauty in a sexual partner was seen as a common attribute of humans and apes.

> Still less, as he would admit, could he follow out a train of metaphysical reasoning, or solve a mathematical problem, or reflect on God, or admire a grand natural scene. Some apes, however, would probably declare that they could and did admire the beauty of the coloured skin and fur of their partners in marriage.[64]

Principles of Sexual Selection

Darwin stated that animals other than humans are able to show taste and discriminate based on beauty.

> Through repeated deadly contests, a slight degree of variability, if it led to some advantage, however slight, would suffice for the work of sexual selection; and it is certain that secondary sexual characters are eminently variable. In the same manner as man can give beauty, according to his standard of taste, to his male poultry—can give to the Sebright bantam a new and elegant plumage, an erect and peculiar carriage—so it appears that in a state of nature female birds, by having long selected the more attractive males, have added to their beauty. No doubt this implies powers of discrimination and taste on the part of the female which will at first appear extremely improbable; but I hope hereafter to shew that this is not the case.[65]

Secondary Sexual Characters in the Lower Classes of the Animal Kingdom

Darwin drew the line at protozoa exhibiting a sense of beauty and the few differences between the sexes in parasitic worms he puts down to other reasons.

> Moreover it is almost certain that these animals have too imperfect senses and much too low mental powers to feel mutual rivalry, or to appreciate each other's beauty or other attractions.
>
> Hence in these classes, such as the Protozoa, Cœlenterata, Echinodermata, Scolecida, true secondary sexual characters do not occur; and this fact agrees with the belief that such characters in the higher classes have been acquired through sexual selection, which depends on the will, desires, and choice of either sex.[66]

Secondary Sexual Characters

Certain beautiful colours, such as blood, bile and autumn leaves he explained as the result of the chemical properties of the substances involved.

> Hardly any colour is finer than that of arterial blood; but there is no reason to suppose that the colour of the blood is in itself any advantage; and though it adds to the beauty of the maiden's cheek, no one will pretend that it has been acquired for this purpose. So again with many animals, especially the lower ones, the bile is richly coloured; thus the extreme beauty of the Eolidæ (naked sea-slugs) is chiefly due, as I am informed by Mr. Hancock, to the biliary glands seen through

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64 *ibid*., p. 105.
65 *ibid*., pp. 258-59.
66 *ibid*., p. 321.

> the translucent integuments; this beauty being probably of no service to these animals.[67]

Darwin takes an extreme example but in the explanation combines sexual and natural selection in a confusing way. If the hermaphrodites were able to discriminate in the first place, an improbable hypothesis, then that ability would be passed on to their offspring and the beauty would be preserved by sexual selection. He appears not to wish to apply sexual selection to the hermaphrodites and so looks to fitness as the criteria. Obviously, if beauty was associated with fitness then the beauty would be preserved through the process of natural selection but this does not require any selection or appreciation of beauty on the part of the hermaphrodites in the first place.

> It is conceivable that two hermaphrodites, attracted by each others' greater beauty, might unite and leave offspring which would inherit their parents' greater beauty. But with such lowly-organised creatures this is extremely improbable. Nor is it at all obvious how the offspring from the more beautiful pairs of hermaphrodites would have any advantage, so as to increase in numbers, over the offspring of the less beautiful, unless indeed vigour and beauty generally coincided.[68]

Darwin related beauty to sight by showing that blind beetles are not brightly coloured.

> Blind beetles, which cannot of course behold each other's beauty, never exhibit, as I hear from Mr. Waterhouse, jun., bright colours, though they often have polished coats: but the explanation of their obscurity may be that blind insects inhabit caves and other obscure stations.[69]

Insects, *Continued*.—Order Lepidoptera

Darwin spends a long time looking at the beauty of butterflies and moths.

> Every one has admired the extreme beauty of many butterflies and of some moths; and we are led to ask, how has this beauty been acquired? Have their colours and diversified patterns simply resulted from the direct action of the physical conditions to which these insects have been exposed, without any benefit being thus derived? Or have successive variations been accumulated and determined either as a protection or for some unknown purpose, or that one sex might be rendered attractive to the other? And, again, what is the meaning of the colours being widely different in the males and females of certain species, and alike in the two sexes of other species? Before attempting to answer these questions a body of facts must be given.[70]

Attributes are passed on to all offspring, explaining as Darwin points out elsewhere (pp. 210-211) the existence of nipples in males. As a result, the beauty of a male butterflies gets passed on, to a certain extent, to the females.

> It also deserves notice that in those groups in which the sexes present any difference of colour, the females usually resemble the males to a certain extent,

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67 *ibid*., p. 323.
68 *ibid*., p. 327.
69 *ibid*., p. 367.
70 *ibid*., p. 387.

> so that when the males are beautiful to an extraordinary degree, the females almost invariably exhibit some degree of beauty.[71]

Darwin pointed out two other reasons why butterflies might have bright colours, to warn predators that they are unpalatable or to imitate another species that is in some way offensive to their shared predators.

> Nevertheless it is possible that the conspicuous colours of many species may be in an indirect manner beneficial, as will hereafter be explained, by leading their enemies at once to recognise them as unpalatable. Even in this case it does not certainly follow that their bright colours and beautiful patterns were acquired for this special purpose. In some other remarkable cases, beauty has been gained for the sake of protection, through the imitation of other beautiful species, which inhabit the same district and enjoy an immunity from attack by being in some way offensive to their enemies.[72]

Darwin explained why females mate with 'dingy' males, they are the best available as males emerge earlier and so are more battered. He confirmed that it is always the female that selects the most beautiful male.

> Some facts, however, are opposed to the belief that female butterflies prefer the more beautiful males; thus, as I have been assured by several observers, fresh females may frequently be seen paired with battered, faded or dingy males; but this is a circumstance which could hardly fail often to follow from the males emerging from their cocoons earlier than the females [...] I have no reason to suspect, either with moths or butterflies, that the males are attracted by the beauty of the females. If the more beautiful females had been continually preferred, it is almost certain, from the colours of butterflies being so frequently transmitted to one sex alone, that the females would often have been rendered more beautiful than their male partners. But this does not occur except in a few instances; and these can be explained, as we shall presently see, on the principle of mimickry and protection [...] there would be no difficulty in permanently increasing by means of selection the beauty of either species [Papilio sesostris and Papilio childrenae].[73]

Darwin expands on the point made earlier that certain bright colouring is a result of natural selection rather than sexual selection.

> Bright Colours of Caterpillars.—Whilst reflecting on the beauty of many butterflies, it occurred to me that some caterpillars were splendidly coloured, and as sexual selection could not possibly have here acted, it appeared rash to attribute the beauty of the mature insect to this agency, unless the bright colours of their larvæ could be in some manner explained [...] From such considerations Mr. Wallace thought it probable that conspicuously-coloured caterpillars were protected by having a nauseous taste; but as their skin is extremely tender, and as their intestines readily protrude from a wound, a slight peck from the beak of a bird would be as fatal to them as if they had been devoured. Hence, as Mr. Wallace remarks, "distastefulness alone would be insufficient to protect a caterpillar unless some outward sign indicated to its would-be destroyer that its prey was a disgusting morsel." Under these circumstances it would be highly advantageous to a caterpillar to be instantaneously and certainly recognised as unpalatable by all birds and other animals.[74]

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[71] *ibid*., p. 391.
[72] *ibid*., p. 393.
[73] *ibid*., pp. 400-02.
[74] *ibid*., pp. 415-16.

As proof that females do in fact select males to mate with Darwin explained that the male contrivances for seizing a female imply the reluctance of the female.

> Sexual selection implies that the more attractive individuals are preferred by the opposite sex; and as with insects, when the sexes differ, it is the male which, with rare exceptions, is the most ornamented and departs most from the type to which the species belongs;—and as it is the male which searches eagerly for the female, we must suppose that the females habitually or occasionally prefer the more beautiful males, and that these have thus acquired their beauty. That in most or all the orders the females have the power of rejecting any particular male, we may safely infer from the many singular contrivances possessed by the males, such as great jaws, adhesive cushions, spines, elongated legs, &c., for seizing the female; for these contrivances shew that there is some difficulty in the act. [...] there is little improbability in the females of other insects appreciating beauty in form or colour, and consequently in such characters having been thus gained by the males. But from the circumstance of colour being so variable, and from its having been so often modified for the sake of protection, it is extremely difficult to decide in how large a proportion of cases sexual selection has come into play.[75]

Darwin Descent of Man, First Edition, Second Volume, 1871

Volume 2 concerns human beings and has one hundred and one uses of the word 'beauty' excluding forty entries in the contents and index, one use of 'sublimity' and one use of 'taste'.[76]

Reptiles

Darwin suggests that the 'extreme beauty' of certain snakes is a result of sexual selection.

> It does not, however, follow because snakes have some reasoning power and strong passions, that they should likewise be endowed with sufficient taste to admire brilliant colours in their partners, so as to lead to the adornment of the species through sexual selection. Nevertheless it is difficult to account in any other manner for the extreme beauty of certain species; for instance, of the coral-snakes of S. America.[77]

Decoration

Darwin adds the footnote, 'See remarks to this effect, on the "Feeling of Beauty among Animals," by Mr. J. Shaw, in the *Athenæum*, 24 November, 1866, p. 681.' The article brings forward many examples of ornaments in animals that are proposed to result from sexual selection. Shaw corresponds with Darwin at the end of November 1866 (letter 4939 and 4943), in February 1866, (letters 5003f, 5004, 5005, 5060 and 5006) and in November 1866 (letters 5270 and 5284a) when his article was published.

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75 *ibid*., pp. 421-22.
76 There is an index entry for 'beauty' and 'beautiful'.
77 Darwin, *Descent*, 1st edn (1871), II, p. 31.

Sexual Selection, Birds

Darwin mentioned the three main examples of male beauty in birds, the peacock, the Bird of Paradise and hummingbirds. The other example he spends a long time considering in Volume 2 is the Argus Pheasant with what appears to be an imitation of an artist's representation of a ball and socket.

> Nor need much be said on the wonderful differences between the sexes, or of the extreme beauty of the males of many birds. The common peacock offers a striking instance. Female Birds of Paradise are obscurely coloured and destitute of all ornaments, whilst the males are probably the most highly decorated of all birds, and in so many ways, that they must be seen to be appreciated [...] Male humming-birds almost vie with Birds of Paradise in their beauty, as every one will admit who has seen Mr. Gould's splendid volumes or his rich collection.[78]

Darwin provided a number of examples to convince the reader that the male birds are actively displaying their beauty. This is because his theory of sexual selection depends on the female selecting, that is choosing one (or more) birds to mate with to the exclusion of others and this had to be based on a discernible feature or features that one group of birds has to a greater degree than the others.

> All naturalists who have closely attended to the habits of birds, whether in a state of nature or under confinement, are unanimously of opinion that the males delight to display their beauty. Audubon frequently speaks of the male as endeavouring in various ways to charm the female. Mr. Gould, after describing some peculiarities in a male humming-bird, says he has no doubt that it has the power of displaying them to the greatest advantage before the female. Dr. Jerdon insists that the beautiful plumage of the male serves "to fascinate and attract the female." Mr. Bartlett, at the Zoological Gardens, expressed himself to me in the strongest terms to the same effect.[79] (pp. 86-7)

Darwin used the beauty of the Argus pheasant feathers to argue that the 'lower animals' have 'discrimination and taste' and an appreciation of 'refined beauty'.

> I have shewn this feather to several persons, and many have admired it even more than the ball-and-socket feathers, and have declared that it was more like a work of art than of nature. [...]The case of the male Argus pheasant is eminently interesting, because it affords good evidence that the most refined beauty may serve as a charm for the female, and for no other purpose. We must conclude that this is the case, as the primary wing-feathers are never displayed, and the ball-and-socket ornaments are not exhibited in full perfection, except when the male assumes the attitude of courtship. [...] Many will declare that it is utterly incredible that a female bird should be able to appreciate fine shading and exquisite patterns. It is undoubtedly a marvellous fact that she should possess this almost human degree of taste, though perhaps she admires the general effect rather than each separate detail. He who thinks that he can safely gauge the discrimination and taste of the lower animals, may deny that the female Argus pheasant can appreciate such refined beauty; but he will then be compelled to admit that the extraordinary attitudes assumed by the male during the act of courtship, by which the wonderful beauty of his plumage is fully displayed, are purposeless; and this is a conclusion which I for one will never admit.[80]

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[78] *ibid*., pp. 76-78.
[79] *ibid*., pp. 86-87.
[80] *ibid*., pp. 92-93.

Darwin argued from the disadvantages that beautiful ornaments bring to their owner that in some case beauty is more important than 'success in battle'.

> Sufficient facts have now been given to shew with what care male birds display their various charms, and this they do with the utmost skill. Whilst preening their feathers, they have frequent opportunities for admiring themselves and of studying how best to exhibit their beauty. But as all the males of the same species display themselves in exactly the same manner, it appears that actions, at first perhaps intentional, have become instinctive. If so, we ought not to accuse birds of conscious vanity; yet when we see a peacock strutting about, with expanded and quivering tail-feathers, he seems the very emblem of pride and vanity [...] As birds always breed when food is abundant, the males probably do not suffer much inconvenience in searching for food from their impeded powers of movement; but there can hardly be a doubt that they must be much more liable to be struck down by birds of prey. Nor can we doubt that the long train of the peacock and the long tail and wing-feathers of the Argus pheasant must render them a more easy prey to any prowling tiger-cat than would otherwise be the case. Even the bright colours of many male birds cannot fail to make them conspicuous to their enemies of all kinds. Hence it probably is, as Mr. Gould has remarked, that such birds are generally of a shy disposition, as if conscious that their beauty was a source of danger, and are much more difficult to discover or approach, than the sombre-coloured and comparatively tame females, or than the young and as yet unadorned males [...] From the foregoing facts we clearly see that the plumes and other ornaments of the male must be of the highest importance to him; and we further see that beauty in some cases is even more important than success in battle.[81]

Darwin argued that females do discriminate and prefer certain males because of their superior song or beauty.

> WHEN the sexes differ in beauty, in the power of singing, or in producing what I have called instrumental music, it is almost invariably the male which excels the female. These qualities, as we have just seen, are evidently of high importance to the male. When they are gained for only a part of the year, this is always shortly before the breeding-season. It is the male alone who elaborately displays his varied attractions, and often performs strange antics on the ground or in the air, in the presence of the female. Each male drives away or, if he can, kills all his rivals. Hence we may conclude, that it is the object of the male to induce the female to pair with him, and for this purpose he tries to excite or charm her in various ways; and this is the opinion of all those who have carefully studied the habits of living birds. However, there remains a question, which has an all important bearing on sexual selection, namely, does every male of the same species equally excite and attract the female? or does she exert a choice, and prefer certain males? This question can be answered in the affirmative by much direct and indirect evidence.[82]

Darwin used the evidence of birds looking at themselves in a mirror to justify describing their action as 'appreciating beauty'.

> As male birds display with so much care their fine plumage and other ornaments in the presence of the females, it is obviously probable that these appreciate the beauty of their suitors. It is, however, difficult to obtain direct evidence of their capacity to appreciate beauty. When birds gaze at themselves in a looking-glass (of which many instances have been recorded) we cannot feel sure that it is not from jealousy at a supposed rival, though this is not the conclusion of some observers. In other cases it is difficult to distinguish between mere curiosity and admiration.[83]

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81 *ibid*., pp. 96-98.
82 *ibid*., p. 99.
83 *ibid*., p. 111.

Darwin reported contrary evidence to the effect that females do not prefer certain males on account of their beauty but later explained this as resulting from their domestic environment:

> Turning now to domesticated and confined birds, I will commence by giving what little I have learnt respecting the courtship of fowls. I have received long letters on this subject from Messrs. Hewitt and Tegetmeier, and almost an essay from the late Mr. Brent. It will be admitted by every one that these gentlemen, so well known from their published works, are careful and experienced observers. They do not believe that the females prefer certain males on account of the beauty of their plumage; but some allowance must be made for the artificial state under which they have long been kept. Mr. Tegetmeier is convinced that a game-cock, though disfigured by being dubbed with his hackles trimmed, would be accepted as readily as a male retaining all his natural ornaments. Mr. Brent, however, admits that the beauty of the male probably aids in exciting the female; and her acquiescence is necessary.[84]

He equated the female birds selecting a mate at a lek with a pretty girl selecting a 'wooer' at a country fair:

> With respect to female birds feeling a preference for particular males, we must bear in mind that we can judge of choice being exerted, only by placing ourselves in imagination in the same position. If an inhabitant of another planet were to behold a number of young rustics at a fair, courting and quarrelling over a pretty girl, like birds at one of their places of assemblage, he would be able to infer that she had the power of choice only by observing the eagerness of the wooers to please her, and to display their finery. Now with birds, the evidence stands thus; they have acute powers of observation, and they seem to have some taste for the beautiful both in colour and sound. It is certain that the females occasionally exhibit, from unknown causes, the strongest antipathies and preferences for particular males. When the sexes differ in colour or in other ornaments, the males with rare exceptions are the most highly decorated, either permanently or temporarily during the breeding-season.[85]

Darwin justified the selection of beauty by birds by stating that their minds do not differ fundamentally from ours if reason is excluded:

> [...] we ought not to feel too sure that the female does not attend to each detail of beauty. We can judge, as already remarked, of choice being exerted, only from the analogy of our own minds; and the mental powers of birds, if reason be excluded, do not fundamentally differ from ours. From these various considerations we may conclude that the pairing of birds is not left to chance; but that those males, which are best able by their various charms to please or excite the female, are under ordinary circumstances accepted. If this be admitted, there is not much difficulty in understanding how male birds have gradually acquired their ornamental characters.[86]

Features of the male, such as brilliant colours, will be passed to offspring of both sexes and so it may be the males that do the selection even though it appears to be the females. Darwin reasoned that this is unlikely, as if this were the case then females would be at least 'to a slight degree' more beautiful than the males. He also considered the

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[84] *ibid*., p. 117.
[85] *ibid*., pp. 122-23.
[86] *ibid*., p. 124.

possibility that both sexes select each other but discounts this as one sex is more eager than the other and it would be less efficient.

> The brilliant or conspicuous colours which characterise many birds in the present class, can rarely or never be of service to them as a protection; so that they have probably been gained by the males through sexual selection, and then transferred to the females and the young. It is, however, possible that the males may have selected the more attractive females; and if these transmitted their characters to their offspring of both sexes, the same results would follow as from the selection of the more attractive males by the females. But there is some evidence that this contingency has rarely, if ever, occurred in any of those groups of birds, in which the sexes are generally alike; for if even a few of the successive variations had failed to be transmitted to both sexes, the females would have exceeded to a slight degree the males in beauty. Exactly the reverse occurs under nature; for in almost every large group, in which the sexes generally resemble each other, the males of some few species are in a slight degree more brightly coloured than the females. It is again possible that the females may have selected the more beautiful males, these males having reciprocally selected the more beautiful females; but it is doubtful whether this double process of selection would be likely to occur, owing to the greater eagerness of one sex than the other, and whether it would be more efficient than selection on one side alone. It is, therefore, the most probable view that sexual selection has acted, in the present class, as far as ornamental characters are concerned, in accordance with the general rule throughout the animal kingdom, that is, on the males; and that these have transmitted their gradually-acquired colours, either equally or almost equally, to their offspring of both sexes.[87]

Darwin pointed out that selection done during courtship is prolonged and a group affair. He also pointed out that males are more likely to have been those that were sexually selected for their beauty as they vary more than the females.

> The males display their charms with elaborate care and to the best effect; and this is done in the presence of the females. The courtship is sometimes a prolonged affair, and many males and females congregate at an appointed place. To suppose that the females do not appreciate the beauty of the males is to admit that their splendid decorations, all their pomp and display, are useless; and this is incredible. Birds have fine powers of discrimination, and in some few instances it can be shewn that they have a taste for the beautiful. The females, moreover, are known occasionally to exhibit a marked preference or antipathy for certain individual males.
>
> If it be admitted that the females prefer, or are unconsciously excited by the more beautiful males, then the males would slowly but surely be rendered more and more attractive through sexual selection. That it is this sex which has been chiefly modified we may infer from the fact that in almost every genus in which the sexes differ, the males differ much more from each other than do the females; this is well shewn in certain closely-allied representative species in which the females can hardly be distinguished, whilst the males are quite distinct.[88]

Sexual Selection, Mammals

Darwin recognized that beauty in some animals, such as the zebra, is not a result of sexual selection.

> The zebra is conspicuously striped, and stripes on the open plains of South Africa cannot afford any protection. Burchell in describing a herd says, "their sleek ribs glistened in the sun, and the brightness and regularity of their striped coats

[87] *ibid*., pp. 210-11.
[88] *ibid*., pp. 233-34.

> presented a picture of extraordinary beauty, in which probably they are not surpassed by any other quadruped." Here we have no evidence of sexual selection, as throughout the whole group of the Equidæ [the horse family] the sexes are identical in colour.[89]

Many mammals, such as the West African Diana Monkey, do have ornaments that appear to be sexually selected.

> In the Zoological Society's Gardens I have often overheard visitors admiring the beauty of another monkey, deservedly called Cercopithecus Diana; [...] In these and many other monkeys, the beauty and singular arrangement of their colours, and still more the diversified and elegant arrangement of the crests and tufts of hair on their heads, force the conviction on my mind that these characters have been acquired through sexual selection exclusively as ornaments.[90]

Secondary Sexual Characters of Man

This and the next section contain the central argument concerning beauty and human beings and the complete section is therefore relevant. The following extracts contain the main points of the argument. The original footnotes have been deleted unless directly relevant.

Darwin first outlined the physical differences between the sexes in humans. Note that 'Quadrumana', literally 'four-handed ones', is an early distinction between the apes and man based on the hand-like nature of apes feet that was later dropped by Darwin.

> With mankind the differences between the sexes are greater than in most species of Quadrumana, but not so great as in some, for instance, the mandrill. Man on an average is considerably taller, heavier, and stronger than woman, with squarer shoulders and more plainly-pronounced muscles. Owing to the relation which exists between muscular development and the projection of the brows, the superciliary ridge is generally more strongly marked in man than in woman. His body, and especially his face, is more hairy, and his voice has a different and more powerful tone. In certain tribes the women are said, whether truly I know not, to differ slightly in tint from the men; and with Europeans, the women are perhaps the more brightly coloured of the two, as may be seen when both sexes have been equally exposed to the weather.[91]

Darwin continued with a well-known passage describing the mental differences between men and women.

> Man is more courageous, pugnacious, and energetic than woman, and has a more inventive genius. His brain is absolutely larger, but whether relatively to the larger size of his body, in comparison with that of woman, has not, I believe been fully ascertained. In woman the face is rounder; the jaws and the base of the skull smaller; the outlines of her body rounder, in parts more prominent; and her pelvis is broader than in man; but this latter character may perhaps be considered rather as a primary than a secondary sexual character. She comes to maturity at an earlier age than man.[92]

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89 *ibid*., p. 302.
90 *ibid*., p. 312.
91 *ibid*., p. 316.
92 *ibid*., pp. 316-17.

He then described the development of both sexes and concludes that children ‘resemble the mature female much more closely, than the mature male’ and as the male characteristics develop later they are likely to be transmitted to the male sex alone. Racial differences are harder to detect in children and ‘Some have even maintained that race-differences cannot be detected in the infantile skull’.

On p. 318, he pointed out the similarity between the development in man and the Quadrumana in terms of the differences between the sexes and even the beard colour which if it differs is always lighter than the hair. Women of all races are less hairy than men and ‘male monkeys, like men, are bolder and fiercer than the females’. With some species, the difference between the sexes is greater than in man.

On p. 320 he described the secondary sexual characteristics and how they vary between races in terms of relative height, ‘the circumference of the neck and chest, and the length of the back-bone and arms, which were carefully made, nearly all shewed that the males differed much more from each other than did the females. This fact indicates that, as far as these characters are concerned, it is the male which has been chiefly modified, since the races diverged from their common and primeval source.’

The hairiness of men of different races varies ‘remarkably’ from no beards at all to ‘well-developed beards’. In some tribes, although body hair is absent in both sexes the hair on the head ‘attains an extraordinary length in both sexes, often reaching almost to the ground’.

Law of Battle

Darwin discusses the contest between males for females.

> Law of Battle.—With barbarous nations, for instance with the Australians, the women are the constant cause of war both between the individuals of the same tribe and between distinct tribes. So no doubt it was in ancient times; "nam fuit ante Helenam mulier teterrima belli causa.[For even before Helen (of Troy) a woman was a most hideous cause of war]" With the North American Indians, the contest is reduced to a system. That excellent observer, Hearne, says:—"It has ever been the custom among these people for the men to wrestle for any woman to whom they are attached; and, of course, the strongest party always carries off the prize. A weak man, unless he be a good hunter, and well-beloved, is seldom permitted to keep a wife that a stronger man thinks worth his notice." [93]

Darwin expanded on the physical differences between the sexes (p. 325). He put forward the argument that men are not stronger because they work harder, as women work just as hard. This argument implies a Lamarckian way of thinking, which was used to justify modern man continuing to be stronger because men now have to work harder

[93] *ibid*., pp. 323-24.

than women. His argument combines natural selection, sexual selection and inheritable characteristics with a Victorian view of the paterfamilias.

> There can be little doubt that the greater size and strength of man, in comparison with woman, together with his broader shoulders, more developed muscles, rugged outline of body, his greater courage and pugnacity, are all due in chief part to inheritance from some early male progenitor, who, like the existing anthropoid apes, was thus characterised. These characters will, however, have been preserved or even augmented during the long ages whilst man was still in a barbarous condition, by the strongest and boldest men having succeeded best in the general struggle for life, as well as in securing wives, and thus having left a large number of offspring. It is not probable that the greater strength of man was primarily acquired through the inherited effects of his having worked harder than woman for his own subsistence and that of his family; for the women in all barbarous nations are compelled to work at least as hard as the men. With civilised people the arbitrament of battle for the possession of the women has long ceased; on the other hand, the men, as a general rule, have to work harder than the women for their mutual subsistence; and thus their greater strength will have been kept up.[94]

Following this, he discussed the mental differences between men and women (p. 326-7). He referred later to J. Stuart Mill's *The Subjection of Women* (1869) and it is likely that 'some writers' refers to Mill. Darwin does appear to be trying to create a balanced list of characteristics but the problem with all such lists is that it is difficult to separate nature and nurture.

> Difference in the Mental Powers of the two Sexes.—With respect to differences of this nature between man and woman, it is probable that sexual selection has played a very important part. I am aware that some writers doubt whether there is any inherent difference; but this is at least probable from the analogy of the lower animals which present other secondary sexual characters. No one will dispute that the bull differs in disposition from the cow, the wild-boar from the sow, the stallion from the mare, and, as is well known to the keepers of menageries, the males of the larger apes from the females. Woman seems to differ from man in mental disposition, chiefly in her greater tenderness and less selfishness; and this holds good even with savages, as shewn by a well-known passage in Mungo Park's Travels, and by statements made by many other travellers. Woman, owing to her maternal instincts, displays these qualities towards her infants in an eminent degree; therefore it is likely that she should often extend them towards her fellow-creatures. Man is the rival of other men; he delights in competition, and this leads to ambition which passes too easily into selfishness. These latter qualities seem to be his natural and unfortunate birthright. It is generally admitted that with woman the powers of intuition, of rapid perception, and perhaps of imitation, are more strongly marked than in man; but some, at least, of these faculties are characteristic of the lower races, and therefore of a past and lower state of civilisation.[95]

Darwin continued by drawing conclusions that ignore the hegemony of a male dominated society.

> The chief distinction in the intellectual powers of the two sexes is shewn by man attaining to a higher eminence, in whatever he takes up, than woman can attain—whether requiring deep thought, reason, or imagination, or merely the use of the senses and hands. If two lists were made of the most eminent men and women in poetry, painting, sculpture, music, —comprising composition and performance, history, science, and philosophy, with half-a-dozen names under each subject,

[94] *ibid*., pp. 325-26.
[95] *ibid*., pp. 326-27.

> the two lists would not bear comparison. We may also infer, from the law of the deviation of averages, so well illustrated by Mr. Galton, in his work on 'Hereditary Genius,' that if men are capable of decided eminence over women in many subjects, the average standard of mental power in man must be above that of woman.[96]

Darwin suggested a Lamarckian interpretation when he mentions faculties that 'have been strengthened by use' and 'Consequently, in accordance with the principle often alluded to, we might expect that they would at least tend to be transmitted chiefly to the male offspring at the corresponding period of manhood' (p. 328).

He then went on to define genius as patience and perseverance as well as imagination and reason but he again suggested a Lamarckian interpretation in order, perhaps, to support the commonly held views of gender distinction.

> But these latter as well as the former faculties will have been developed in man, partly through sexual selection,—that is, through the contest of rival males, and partly through natural selection,—that is, from success in the general struggle for life; and as in both cases the struggle will have been during maturity, the characters thus gained will have been transmitted more fully to the male than to the female offspring. Thus man has ultimately become superior to woman. It is, indeed, fortunate that the law of the equal transmission of characters to both sexes has commonly prevailed throughout the whole class of mammals; otherwise it is probable that man would have become as superior in mental endowment to woman, as the peacock is in ornamental plumage to the peahen.[97]

On p. 329, he expanded on the Lamarckian idea but then appeared to have a problem trying to explain why equal education for both sexes would not then result in equality of the sexes. He called upon 'the severe struggle' that only men undergo to maintain themselves and their families as the reason that men would always continue to excel in mental powers.

> It must be borne in mind that the tendency in characters acquired at a late period of life by either sex, to be transmitted to the same sex at the same age, and of characters acquired at an early age to be transmitted to both sexes, are rules which, though general, do not always hold good. If they always held good, we might conclude (but I am here wandering beyond my proper bounds) that the inherited effects of the early education of boys and girls would be transmitted equally to both sexes; so that the present inequality between the sexes in mental power could not be effaced by a similar course of early training; nor can it have been caused by their dissimilar early training. In order that woman should reach the same standard as man, she ought, when nearly adult, to be trained to energy and perseverance, and to have her reason and imagination exercised to the highest point; and then she would probably transmit these qualities chiefly to her adult daughters. The whole body of women, however, could not be thus raised, unless during many generations the women who excelled in the above robust virtues were married, and produced offspring in larger numbers than other women. As before remarked with respect to bodily strength, although men do not now fight for the sake of obtaining wives, and this form of selection has passed away, yet they generally have to undergo, during manhood, a severe struggle in order to maintain themselves and their families; and this will tend to keep up or

[96] *ibid*., p. 327.
[97] *ibid*., pp. 328-29.

> even increase their mental powers, and, as a consequence, the present inequality between the sexes.[98]

From pp. 330 to 337, Darwin discussed the musical abilities of the human races and pointed out that there is no universal agreement on why we have the ability or why it differs between the races.

> With man song is generally admitted to be the basis or origin of instrumental music. As neither the enjoyment nor the capacity of producing musical notes are faculties of the least direct use to man in reference to his ordinary habits of life, they must be ranked amongst the most mysterious with which he is endowed. They are present, though in a very rude and as it appears almost latent condition, in men of all races, even the most savage; but so different is the taste of the different races, that our music gives not the least pleasure to savages, and their music is to us hideous and unmeaning.[99]

He then discussed the possible origin of the musical ability of humans. Darwin suggests it may have been part of courtship but his ideas are based on the Western Romantic tradition rather than the range of music around the world, which he dismisses as 'hideous and unmeaning'.

> Music affects every emotion, but does not by itself excite in us the more terrible emotions of horror, rage, &c. It awakens the gentler feelings of tenderness and love, which readily pass into devotion. It likewise stirs up in us the sensation of triumph and the glorious ardour for war. These powerful and mingled feelings may well give rise to the sense of sublimity. We can concentrate, as Dr. Seemann observes, greater intensity of feeling in a single musical note than in pages of writing. Nearly the same emotions, but much weaker and less complex, are probably felt by birds when the male pours forth his full volume of song, in rivalry with other males, for the sake of captivating the female. Love is still the commonest theme of our own songs. As Herbert Spencer remarks, music "arouses dormant sentiments of which we had not conceived the possibility, and do not know the meaning; or, as Richter says, tells us of things we have not seen and shall not see."[100] Conversely, when vivid emotions are felt and expressed by the orator or even in common speech, musical cadences and rhythm are instinctively used. Monkeys also express strong feelings in different tones—anger and impatience by low,—fear and pain by high notes. The sensations and ideas excited in us by music, or by the cadences of impassioned cratory, appear from their vagueness, yet depth, like mental reversions to the emotions and thoughts of a long-past age.[101]

Darwin speculated on the origins of music, which although not directly relevant to the visual arts does illuminate his thinking about how sexual selection can give rise to a

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98 *ibid*., p. 329.

99 *ibid*., p. 333.

100 Darwin adds the footnote, 'see the very interesting discussion on the *Origin and Function of Music*, by Mr. Herbert Spencer, in his collected 'Essays,' 1858, p. 359. Mr. Spencer comes to an exactly opposite conclusion to that at which I have arrived. He concludes that the cadences used in emotional speech afford the foundation from which music has been developed; whilst I conclude that musical notes and rhythm were first acquired by the male or female progenitors of mankind for the sake of charming the opposite sex. Thus musical tones became firmly associated with some of the strongest passions an animal is capable of feeling, and are consequently used instinctively, or through association, when strong emotions are expressed in speech. Mr. Spencer does not offer any satisfactory explanation, nor can I, why high or deep notes should be expressive, both with man and the lower animals, of certain emotions. Mr. Spencer gives also an interesting discussion on the relations between poetry, recitative, and song.'

101 Darwin, *Descent*, 1st edn (1871), II, pp. 335-36

characteristic that has become embedded so far into our cultural complex that we little suspect its origin. This passage is a good example of how scientific writing can have an impact outside of its strict terms because it appears to give an insight into what lies behind our day-to-day living. This metaphysical undercurrent is exploited by Darwin and it could have encouraged the unscientific speculations of Social Darwinism later in the century.

> All these facts with respect to music become to a certain extent intelligible if we may assume that musical tones and rhythm were used by the half-human progenitors of man, during the season of courtship, when animals of all kinds are excited by the strongest passions. In this case, from the deeply-laid principle of inherited associations, musical tones would be likely to excite in us, in a vague and indefinite manner, the strong emotions of a long-past age. Bearing in mind that the males of some quadrumanous animals have their vocal organs much more developed than in the females, and that one anthropomorphous species pours forth a whole octave of musical notes and may be said to sing, the suspicion does not appear improbable that the progenitors of man, either the males or females, or both sexes, before they had acquired the power of expressing their mutual love in articulate language, endeavoured to charm each other with musical notes and rhythm. So little is known about the use of the voice by the Quadrumana during the season of love, that we have hardly any means of judging whether the habit of singing was first acquired by the male or female progenitors of mankind. Women are generally thought to possess sweeter voices than men, and as far as this serves as any guide we may infer that they first acquired musical powers in order to attract the other sex. But if so, this must have occurred long ago, before the progenitors of man had become sufficiently human to treat and value their women merely as useful slaves. The impassioned orator, bard, or musician, when with his varied tones and cadences he excites the strongest emotions in his hearers, little suspects that he uses the same means by which, at an extremely remote period, his half-human ancestors aroused each other's ardent passions, during their mutual courtship and rivalry.[102]

On the Influence of Beauty in Determining the Marriages of Mankind

In this section, Darwin considered the various forms of beauty around the world and gave many examples of male and female ornaments. He speculated that a wife is selected by external appearance, which conflicted with his later observations.

> In civilised life man is largely, but by no means exclusively, influenced in the choice of his wife by external appearance; but we are chiefly concerned with primeval times, and our only means of forming a judgment on this subject is to study the habits of existing semi-civilised and savage nations. If it can be shewn that the men of different races prefer women having certain characteristics, or conversely that the women prefer certain men, we have then to enquire whether such choice, continued during many generations, would produce any sensible effect on the race, either on one sex or both sexes; this latter circumstance depending on the form of inheritance which prevails.[103]

The universal importance of appearance is described with examples.

> It will be well first to shew in some detail that savages pay the greatest attention to their personal appearance. That they have a passion for ornament is notorious; and an English philosopher goes so far as to maintain that clothes were first made for ornament and not for warmth. As Professor Waitz remarks, "however poor and miserable man is, he finds a pleasure in adorning himself." The

[102] *ibid*., pp. 336-37.
[103] *ibid*., p. 338.

> extravagance of the naked Indians of South America in decorating themselves is shewn "by a man of large stature gaining with difficulty enough by the labour of a fortnight to procure in exchange the chica necessary to paint himself red." [...] They paint themselves in the most diversified manner. "If painted nations," as Humboldt observes, "had been examined with the same attention as clothed nations, it would have been perceived that the most fertile imagination and the most mutable caprice have created the fashions of painting, as well as those of garments."[104]

Darwin gave many examples that show that beauty is culturally determined.

> In one part of Africa the eyelids are coloured black; in another the nails are coloured yellow or purple. In many places the hair is dyed of various tints. In different countries the teeth are stained black, red, blue, &c., and in the Malay Archipelago it is thought shameful to have white teeth like those of a dog. Not one great country can be named, from the Polar regions in the north to New Zealand in the south, in which the aborigines do not tattoo themselves. [...] In the Arab countries no beauty can be perfect until the cheeks "or temples have been gashed." [...] In Northern Africa "a man requires a period of from "eight to ten years to perfect his coiffure." With other nations the head is shaved, and in parts of South America and Africa even the eyebrows are eradicated. The natives of the Upper Nile knock out the four front teeth, saying that they do not wish to resemble brutes. Further south, the Batokas knock out the two upper incisors, which, as Livingstone remarks, gives the face a hideous appearance, owing to the growth of the lower jaw; but these people think the presence of the incisors most unsightly, and on beholding some Europeans, cried out, "Look at the great teeth!" The great chief Sebituani tried in vain to alter this fashion. In various parts of Africa and in the Malay Archipelago the natives file the incisor teeth into points like those of a saw, or pierce them with holes, into which they insert studs.[105]

The full paragraph is quoted below to show the wide range of examples and the strength of the feeling surrounding beauty. This makes it clear that the Western European paradigm of classical beauty is not a universal absolute whose ratios can be studied as a science.

> As the face with us is chiefly admired for its beauty, so with savages it is the chief seat of mutilation. In all quarters of the world the septum, and more rarely the wings of the nose are pierced, with rings, sticks, feathers, and other ornaments inserted into the holes. The ears are everywhere pierced and similarly ornamented, and with the Botucudos and Lenguas of South America the hole is gradually so much enlarged that the lower edge touches the shoulder. In North and South America and in Africa either the upper or lower lip is pierced; and with the Botocudos the hole in the lower lip is so large that a disc of wood four inches in diameter is placed in it. Mantegazza gives a curious account of the shame felt by a South American native, and of the ridicule which he excited, when he sold his tembeta,—the large coloured piece of wood which is passed through the hole. In central Africa the women perforate the lower lip and wear a crystal, which, from the movement of the tongue, has "a wriggling motion indescribably ludicrous during conversation. The wife of the chief of Latooka told Sir S. Baker that his wife would be much improved if she would extract her four front teeth from the lower jaw, and wear the long pointed polished crystal in her under lip." Further south with the Makalolo, the upper lip is perforated, and a large metal and bamboo ring, called a pelelé, is worn in the hole. "This caused the lip in one case to project two inches beyond the tip of the nose; and when the lady smiled the contraction of the muscles elevated it over the eyes. 'Why do the women wear “these things?” the venerable chief, Chinsurdi, was asked. Evidently surprised at such a stupid question, he replied, 'For beauty! They are the only beautiful things women have; men have beards, women have none. What kind of a person would

[104] *ibid*., pp. 338-39
[105] *ibid*., pp. 339-40

> she be without the pelelé? She would not be a woman at all with a mouth like a man, but no beard.'[106]

Beauty

There is some evidence that men are more highly ornamented:

> In most, but not all parts of the world, the men are more highly ornamented than the women, and often in a different manner; sometimes, though rarely, the women are hardly at all ornamented. As the women are made by savages to perform the greatest share of the work, and as they are not allowed to eat the best kinds of food, so it accords with the characteristic selfishness of man that they should not be allowed to obtain, or to use, the finest ornaments.[107]

However, women also go to great lengths to ornament themselves:

> Having made these preliminary remarks on the admiration felt by savages for various ornaments, and for deformities most unsightly in our eyes, let us see how far the men are attracted by the appearance of their women, and what are their ideas of beauty. As I have heard it maintained that savages are quite indifferent about the beauty of their women, valuing them solely as slaves, it may be well to observe that this conclusion does not at all agree with the care which the women take in ornamenting themselves, or with [344] their vanity. Burchell gives an amusing account of a Bush-woman, who used so much grease, red ochre, and shining powder, "as would have ruined any but a very rich husband." She displayed also "much vanity and too evident a consciousness of her superiority." Mr. Winwood Reade informs me that the negroes of the West Coast often discuss the beauty of their women. Some competent observers have attributed the fearfully common practice of infanticide partly to the desire felt by the women to retain their good looks. In several regions the women wear charms and love-philters to gain the affections of the men; and Mr. Brown enumerates four plants used for this purpose by the women of North-Western America.[108]

The idea of physical beauty in women also varies enormously:

> Hearne, who lived many years with the American Indians, and who was an excellent observer, says, in speaking of the women, 'Ask a Northern Indian what is beauty, and he will answer, a broad flat face, small eyes, high cheek-bones, three or four broad black lines across each cheek, a low forehead, a large broad chin, a clumsy hook nose, a tawny hide, and breasts hanging down to the belt.' Pallas, who visited the northern parts of the Chinese empire, says 'those women are preferred who have the Mandschú form; that is to say, a broad face, high cheek-bones, very broad noses, and enormous ears;' and Vogt remarks that the obliquity of the eye, which is proper to the Chinese and Japanese. [...] The Siamese have small noses with divergent nostrils, a wide mouth, rather thick lips, a remarkably large face, with very high and broad cheek-bones. It is, therefore, not wonderful that "beauty, according to our notion is a stranger to them. Yet they consider their own females to be much more beautiful than those of Europe.'[109]

Darwin then gave the famous example of the beauty of 'Hottentot' women. The term 'Hottentot', is now considered offensive as it meant "stutterer" or "stammerer" in the colonists' northern dialect of Dutch. The native people of southwestern Africa formerly described as Hottentot are the Khoikhoi, which means "people people" or "real people". The most famous Khoikhoi person in Victorian England was Saartjie or 'Sarah' Baartman

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[106] *ibid*., pp. 341-42
[107] *ibid*., p. 343
[108] *ibid*., pp. 343-44
[109] *ibid*., pp. 344-45

(1789-1815) one of at least two Khoikhoi women who were exhibited as sideshow attractions in 19th century Europe under the name Hottentot Venus.

> It is well known that with many Hottentot women the posterior part of the body projects in a wonderful manner; they are steatopygous; and Sir Andrew Smith is certain that this peculiarity is greatly admired by the men.[110] He once saw a woman who was considered a beauty, and she was so immensely developed behind, that when seated on level ground she could not rise, and had to push herself along until she came to a slope. Some of the women in various negro tribes are similarly characterised; and, according to Burton, the Somal men 'are said to choose their wives by ranging them in a line, and by picking her out who projects farthest a tergo, Nothing can be more hateful to a negro than the opposite form.'[111]

Beards and hairiness in men were fashionable in Victorian England but as Darwin pointed out, they were not universally admired.

> It is remarkable that throughout the world the races which are almost completely destitute of a beard dislike hairs on the face and body, and take pains to eradicate them. The Kalmucks are beardless, and they are well known, like the Americans, to pluck out all straggling hairs; and so it is with the Polynesians, some of the Malays, and the Siamese. Mr. Veitch states that the Japanese ladies "all objected to our whiskers, considering them very ugly, and told us to cut them off, and be like Japanese men." The New Zealanders are beardless; they carefully pluck out the hairs on the face, and have a saying that "There is no woman for a hairy man."
>
> On the other hand, bearded races admire and greatly value their beards; among the Anglo-Saxons every part of the body, according to their laws, had a recognised value; "the loss of the beard being estimated at twenty shillings, while the breaking of a thigh was fixed at only twelve." In the East men swear solemnly by their beards. We have seen that Chinsurdi, the chief of the Makalolo in Africa, evidently thought that beards were a great ornament. With the Fijians in the Pacific the beard is "profuse and bushy, and is his greatest pride;" whilst the inhabitants of the adjacent archipelagoes of Tonga and Samoa are "beardless, and abhor a rough chin." In one island alone of the Ellice group "the men are heavily bearded, and not a little proud thereof."
>
> We thus see how widely the different races of man differ in their taste for the beautiful. In every nation sufficiently advanced to have made effigies of their gods or of their deified rulers, the sculptors no doubt have endeavoured to express their highest ideal of beauty and grandeur. Under this point of view it is well to compare in our mind the Jupiter or Apollo of the Greeks with the Egyptian or Assyrian statues; and these with the hideous bas-reliefs on the ruined buildings of Central America.[112]

One conclusion was that ideal beauty consists in the exaggeration of those features that are naturally provided:

> The truth of the principle, long ago insisted on by Humboldt, that man admires and often tries to exaggerate whatever characters nature may have given him, is shewn in many ways. The practice of beardless races extirpating every trace of a

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[110] Steatopygia is a high degree of fat accumulation in and around the buttocks. At this point Darwin adds the footnote in Latin, 'Idem illustrissimus viator dixit mihi præcinctorium vel tabula fæminæ, quod nobis teterrimum est, quondam permagno æstimari ab hominibus in hac gente. Nunc res mutata est, et censet talem conformationem minime optandam est.' [The famous explorer told me that the very girdle or protuberance on women which we see as repulsive is thought to be of considerable value by the men of this tribe. Now, though, the case has changed and they think that such a shape is by no means desirable.]

[111] Darwin, *Descent*, 1st edn (1871), II, pp. 345-46.

[112] *ibid*., pp. 348-50.

> beard, and generally all the hairs on the body, offers one illustration. The skull has been greatly modified during ancient and modern times by many nations; and there can be little doubt that this has been practised, especially in N. and S. America, in order to exaggerate some natural and admired peculiarity. Many American Indians are known to admire a head flattened to such an extreme degree as to appear to us like that of an idiot. The natives on the northwestern coast compress the head into a pointed cone; and it is their constant practice to gather the hair into a knot on the top of the head, for the sake, as Dr. Wilson remarks, "of increasing the apparent elevation of the favourite conoid form." [...] As with the skull, so with the nose; the ancient Huns during the age of Attila were accustomed to flatten the noses of their infants with bandages, "for the sake of exaggerating a natural conformation." With the Tahitians, to be called long-nose is considered as an insult, and they compress the noses and foreheads of their children for the sake of beauty. [...] The Chinese have by nature unusually small feet; and it is well known that the women of the upper classes distort their feet to make them still smaller. Lastly, Humboldt thinks that the American Indians prefer colouring their bodies with red paint in order to exaggerate their natural tint; and until recently European women added to their naturally bright colours by rouge and white cosmetics; but I doubt whether many barbarous nations have had any such intention in painting themselves.
>
> In the fashions of our own dress we see exactly the same principle and the same desire to carry every point to an extreme; we exhibit, also, the same spirit of emulation.[113]

This principle he also argued applies when a breeder selects an individual:

> The same principle comes largely into play in the art of selection; and we can thus understand, as I have elsewhere explained, the wonderful development of all the races of animals and plants which are kept merely for ornament. Fanciers always wish each character to be somewhat increased; they do not admire a medium standard; they certainly do not desire any great and abrupt change in the character of their breeds; they admire solely what they are accustomed to behold, but they ardently desire to see each characteristic feature a little more developed.[114]

Darwin's conclusion regarding beauty is that there is no universal standard. He made an interesting point concerning 'perfect beauty' namely that it depends on difference and the desire for novelty and exaggeration. This is a very different conception of beauty from the idea of a Polyclitian canon based on absolute ratios.[115]

> No doubt the perceptive powers of man and the lower animals are so constituted that brilliant colours and certain forms, as well as harmonious and rhythmical sounds, give pleasure and are called beautiful; but why this should be so, we know no more than why certain bodily sensations are agreeable and others disagreeable. It is certainly not true that there is in the mind of man any universal standard of beauty with respect to the human body. It is, however, possible that certain tastes may in the course of time become inherited, though I know of no evidence in favour of this belief; and if so, each race would possess its own innate ideal standard of beauty. It has been argued that ugliness consists in an approach to the structure of the lower animals, and this no doubt is true with the more civilised nations, in which intellect is highly appreciated; but a nose twice as prominent, or eyes twice as large as usual, would not be an approach in structure to any of the lower animals, and yet would be utterly hideous. The men of each race prefer what they are accustomed to behold; they cannot endure any great change; but they like variety, and admire each characteristic point carried to a

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[113] *ibid*., pp. 351-52.
[114] *ibid*., p. 353.
[115] The fifth-century treatise on proportion and beauty by Polyclitus is now lost but is referred to by Galen (or Claudius Galenus, *c*. CE 129-200/217) who described the Greek *Canon* of beauty.

> moderate extreme.[116] Men accustomed to a nearly oval face, to straight and regular features, and to bright colours, admire, as we Europeans know, these points when strongly developed. On the other hand, men accustomed to a broad face, with high cheek-bones, a depressed nose, and a black skin, admire these points strongly developed. No doubt characters of all kinds may easily be too much developed for beauty. Hence a perfect beauty, which implies many characters modified in a particular manner, will in every race be a prodigy. As the great anatomist Bichat long ago said, if every one were cast in the same mould, there would be no such thing as beauty. If all our women were to become as beautiful as the Venus de Medici, we should for a time be charmed; but we should soon wish for variety; and as soon as we had obtained variety, we should wish to see certain characters in our women a little exaggerated beyond the then existing common standard.[117]

This is followed by Chapter 20, a continuation of the description of 'secondary sexual characteristics of man'. In the previous chapter, Darwin established that standards of beauty vary from race to race so he next looked for characteristics that are dependent on race.

> We have seen in the last chapter that with all barbarous races ornaments, dress, and external appearance are highly valued; and that the men judge of the beauty of their women by widely different standards. We must next inquire whether this preference and the consequent selection during many generations of those women, which appear to the men of each race the most attractive, has altered the character either of the females alone or of both sexes. With mammals the general rule appears to be that characters of all kinds are inherited equally by the males and females; we might therefore expect that with mankind any characters gained through sexual selection by the females would commonly be transferred to the offspring of both sexes. If any change has thus been effected it is almost certain that the different races will have been differently modified, as each has its own standard of beauty.[118]

At this point Darwin's argument becomes tied up with the complex cultural roles of middle-class Victorian courtship. Men are attracted by mental charms, wealth and social position rather than beauty. He then claimed that women have a 'free or almost free choice' of men but that they selected based on 'social position and wealth' which relied on their or their forefathers 'intellectual powers and energy'.

> With mankind, especially with savages, many causes interfere with the action of sexual selection as far as the bodily frame is concerned. Civilised men are largely attracted by the mental charms of women, by their wealth, and especially by their social position; for men rarely marry into a much lower rank of life. The men who succeed in obtaining the more beautiful women, will not have a better chance of leaving a long line of descendants than other men with plainer wives, with the exception of the few who bequeath their fortunes according to primogeniture. With respect to the opposite form of selection, namely of the more attractive men by the women, although in civilised nations women have free or almost free choice, which is not the case with barbarous races, yet their choice is largely influenced by the social position and wealth of the men; and the success of the latter in life largely depends on their intellectual powers and energy, or on the fruits of these same powers in their forefathers.[119]

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[116] Darwin adds the footnote, 'Mr. Bain has collected ('Mental and Moral Science,' 1868, p. 304-314) about a dozen more or less different theories of the idea of beauty; but none are quite the same with that here given.'

[117] Darwin, *Descent*, 1st edn (1871), II, pp. 353-54.

[118] *ibid*., p. 355.

[119] *ibid*., pp. 355-56.

This leads to a claim by Darwin that the aristocracy are handsomer than the middle-class because for generations aristocratic men have been selecting beautiful women, who although they have a 'free or almost free choice' would, he assumed, select the aristocrat. As the aristocrats' social position and wealth then pass to their son, any sexually inherited characteristics, including beauty, according to the European standard, would also be inherited. A debatable conclusion but one his letters made clear he and some of his colleagues believed. He then stated that the middle classes have conditions of life for the 'perfect development of the body' although it is not clear if he means this is a result of sexual selection and is inherited or if it is simply they have better food which is suggested by the following sentence or if he distinguished between the beauty of the aristocracy and the physical strength of the middle class body. Some of the ideas presented in the paragraph appear to be taken from a letter from Wallace (letter 4514, 29 May [1864]).

> There is, however, reason to believe that sexual selection has effected something in certain civilised and semi-civilised nations. Many persons are convinced, as it appears to me with justice, that the members of our aristocracy, including under this term all wealthy families in which primogeniture has long prevailed, from having chosen during many generations from all classes the more beautiful women as their wives, have become handsomer, according to the European standard of beauty, than the middle classes; yet the middle classes are placed under equally favourable conditions of life for the perfect development of the body. Cook remarks that the superiority in personal appearance "which is observable in the erees or nobles in all the other islands (of the Pacific) is found in the Sandwich islands;" but this may be chiefly due to their better food and manner of life.[120]

Darwin then provided two cases of beauty resulting from sexually selection but he is obviously not convinced by the evidence, perhaps as it is anecdotal and difficult to corroborate.

> The old traveller Chardin, in describing the Persians, says their "blood is now highly refined by frequent intermixtures with the Georgians and Circassians, two nations which surpass all the world in personal beauty. There is hardly a man of rank in Persia who is not born of a Georgian or Circassian mother." He adds that they inherit their beauty, "not from their ancestors, for without the above mixture, the men of rank in Persia, who are descendants of the Tartars, would be extremely ugly."[121] Here is a more curious case: the priestesses who attended the temple of Venus Erycina at San-Giuliano in Sicily, were selected for their beauty out of the whole of Greece; they were not vestal virgins, and Quatrefages, who makes this statement, says that the women of San-Giuliano are famous at the present day as the most beautiful in the island, and are sought by artists as models. But it is obvious that the evidence in the above cases is doubtful.[122]

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[120] *ibid*., p. 356.

[121] Darwin adds the footnote 'These quotations are taken from Lawrence ('Lectures on Physiology,' &c. 1822, p. 393), who attributes the beauty of the upper classes in England to the men having long selected the more beautiful women.'

[122] Darwin, *Descent*, 1st edn (1871), II, pp. 356-57.

Darwin gives an example of how a member of the Jolof Empire (an advanced West African empire that was in existence when the Portuguese arrived between 1444 and 1510) understood sexual selection because of its connection with animal breeding.

> The following case, though relating to savages, is well worth giving from its curiosity. Mr. Winwood Reade informs me that the Jollofs, a tribe of negroes on the west coast of Africa, "are remarkable for their "uniformly fine appearance. A friend of his asked one of these men, "How is it that every one whom I meet is "so fine-looking, not only your men, but your women? The Jollof answered, It is very easily explained: it has always been our custom to pick out our worse looking slaves and to sell them." It need hardly be added that with all savages female slaves serve as concubines. That this negro should have attributed, whether rightly or wrongly, the fine appearance of his tribe, to the long-continued elimination of the ugly women, is not so surprising as it may at first appear; for I have elsewhere shewn that negroes fully appreciate the importance of selection in the breeding of their domestic animals, and I could give from Mr. Reade additional evidence on this head.[123]

Darwin considered the factors that would prevent sexual selection in what he terms ‘savages’. These are the factors that prevent a choice being made by either sex, which results in chance mating. They are communal marriages or promiscuous intercourse, infanticide, especially of female infants, early betrothals and the low estimation in which women are held.

> Now it is asserted that there exist at the present day tribes which practise what Sir J. Lubbock by courtesy calls communal marriages; that is, all the men and women in the tribe are husbands and wives to each other. The licentiousness of many savages is no doubt astonishingly great, but it seems to me that more evidence is requisite before we fully admit that their existing intercourse is absolutely promiscuous.[124] Nevertheless all those who have most closely studied the subject, and whose judgment is worth much more than mine, believe that communal marriage was the original and universal form throughout the world, including the intermarriage of brothers and sisters. The indirect evidence in favour of this belief is extremely strong, and rests chiefly on the terms of relationship which are employed between the members of the same tribe, implying a connection with the tribe alone, and not with either parent. But the subject is too large and complex for even an abstract to be here given, and I will confine myself to a few remarks.[125]

Darwin pointed out that promiscuity does not prevent sexual selection from taking place.

> As far as sexual selection is concerned, all that is required is that choice should be exerted before the parents unite, and it signifies little whether the unions last for life or only for a season.[126] (p. 360)

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[123] *ibid*., pp. 357-58.

[124] Darwin adds the footnote ‘Sir J. Lubbock, 'The Origin of Civilisation,' 1870, chap. iii. especially p. 60-67. Mr. M'Lennan, in his extremely valuable work on 'Primitive Marriage,' 1865, p. 163, speaks of the union of the sexes "in the earliest times as loose, transitory, and in some degree promiscuous." Mr. M'Lennan and Sir J. Lubbock have collected much evidence on the extreme licentiousness of savages at the present time. Mr. L. H. Morgan, in his interesting memoir on the classificatory system of relationship ('Proc. American Acad. of Sciences,' vol. vii. Feb. 1868, p. 475) concludes that polygamy and all forms of marriage during primeval times were essentially unknown. It appears, also, from Sir J. Lubbock's work, that Bachofen likewise believes that communal intercourse originally prevailed.

[125] Darwin, *Descent*, 1st edn (1871), II, pp. 358-59.

[126] *ibid*., p. 360.

Darwin quoted Lubbock in describing how men of certain tribes always captured a wife from a neighbouring hostile tribe making her his sole and valuable property. He went on to quote the claim that licentious women were honoured. Darwin quoted Lubbock's *The Origin of Civilisation and the Primitive Condition of Man* (1870) which contains a comprehensive summary of the position of women, types of marriage, part-marriage, polyandry, polygamy, endogamy and exogamy across the world. It is unclear how much of this book reflects the nineteenth-century view of the degraded and licentious morals of 'savages' compared to the eighteenth century view of their simple and idyllic lives. For example,

> Sir J. Lubbock further gives a most curious body of facts shewing that in old times high honour was bestowed on women who were utterly licentious; and this, as he explains, is intelligible, if we admit that promiscuous intercourse was the aboriginal and therefore long revered custom of the tribe.[127]

Darwin discussed promiscuous intercourse as 'once extremely common' but nevertheless he feels that the example of monogamous gorillas, orang-utans and some monkeys suggests humans were originally monogamous. Nevertheless, sexual selection does not require monogamy only a particular male characteristic, such as strength, mating with a particular female characteristic, such as attractiveness, consistently over many generations.

> We may indeed conclude from what we know of the jealousy of all male quadrupeds, armed, as many of them are, with special weapons for battling with their rivals, that promiscuous intercourse in a state of nature is extremely improbable. The pairing may not last for life, but only for each birth; yet if the males which are the strongest and best able to defend or otherwise assist their females and young offspring, were to select the more attractive females, this would suffice for the work of sexual selection.[128]

Darwin appears to ignore the last sentence and he continued by imagining a family unit headed by a male. This particular conclusion is based on the structure of the gorilla unit but is undermined by the diversity and complexity of the groups structures found around the world as reported by Lubbock in *The Origin of Civilization*.

> Therefore, if we look far enough back in the stream of time, it is extremely improbable that primeval men and women lived promiscuously together. Judging from the social habits of man as he now exists, and from most savages being polygamists, the most probable view is that primeval man aboriginally lived in small communities, each with as many wives as he could support and obtain, whom he would have jealously guarded against all other men.[129]

Darwin then discussed infanticide, which in some tribes he reported is very common and 'In most cases a larger number of female than of male infants are destroyed'. The reasons range from a lack of resources to the loss of beauty in women brought about by trying to rear too many children. As a result, in the cases described the

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[127] *ibid*., pp. 360-61.
[128] *ibid*., pp. 361-62.
[129] *ibid*., pp. 362-63.

number of males far outweighs the number of females. One consequence is 'the habit of capturing wives from neighbouring tribes' which Darwin believed meant the most attractive women were unlikely to have been captured because of the difficulty of the exercise 'and this would have greatly interfered with the power of sexual selection in differentiating the tribes'. The scarcity of women would also lead to polyandry and 'Whenever two or more men are compelled to marry one woman, it is certain that all the women of the tribe will get married, and there will be no selection by the men of the more attractive women.' This though can lead to female selection.

> But under these circumstances the women no doubt will have the power of choice, and will prefer the more attractive men. Azara, for instance, describes how carefully a Guana woman bargains for all sorts of privileges, before accepting some one or more husbands; and the men in consequence take unusual care of their personal appearance. The very ugly men would perhaps altogether fail in getting a wife, or get one later in life, but the handsomer men, although the most successful in obtaining wives, would not, as far as we can see, leave more offspring to inherit their beauty than the less handsome husbands of the same women.[130]

Darwin pointed out that early betrothal 'effectually prevent preference being exerted on either side according to personal appearance. But it would not prevent the more attractive women from being afterwards stolen or taken by force from their husbands by the more powerful men'. Also, if women were valued 'almost exclusively as slaves or beasts of burden' then 'The men, however, at all times would prefer the handsomest slaves according to their standard of beauty.' In conclusion, Darwin argued that sexual selection often does not apply but natural selection would still apply:

> We thus see that several customs prevail with savages which would greatly interfere with, or completely stop, the action of sexual selection. On the other hand, the conditions of life to which savages are exposed, and some of their habits, are favourable to natural selection; and this always comes into play together with sexual selection. Savages are known to suffer severely from recurrent famines; they do not increase their food by artificial means; they rarely refrain from marriage, and generally marry young. Consequently they must be subjected to occasional hard struggles for existence, and the favoured individuals will alone survive.[131]

Darwin then engaged in a highly speculative recreation of 'primeval times' that involves parental love, polygamy or monogamy, no promiscuity, 'powerful and able males' and both sexes choosing attractive partners. It was a time when all 'all the conditions for sexual selection would have been much more favourable'. He explained this was because 'They would have been governed more by their instincts and even less by their reason' and he blamed the later issues of infanticide, early betrothals and promiscuity on the advance in 'intellectual powers'.

> Turning to primeval times when men had only doubtfully attained the rank of manhood, they would probably have lived, as already stated, either as

[130] *ibid*., p. 366.
[131] *ibid*., pp. 366-67.

> polygamists or temporarily as monogamists. Their intercourse, judging from analogy, would not then have been promiscuous. They would, no doubt, have defended their females to the best of their power from enemies of all kinds, and would probably have hunted for their subsistence, as well as for that of their offspring. The most powerful and able males would have succeeded best in the struggle for life and in obtaining attractive females. At this early period the progenitors of man, from having only feeble powers of reason, would not have looked forward to distant contingencies. They would have been governed more by their instincts and even less by their reason than are savages at the present day. They would not at that period have partially lost one of the strongest of all instincts, common to all the lower animals, namely the love of their young offspring; and consequently they would not have practised infanticide. There would have been no artificial scarcity of women, and polyandry would not have been followed; there would have been no early betrothals; women would not have been valued as mere slaves; both sexes, if the females as well as the males were permitted to exert any choice, would have chosen their partners, not for mental charms, or property, or social position, but almost solely from external appearance. All the adults would have married or paired, and all the offspring, as far as that was possible, would have been reared; so that the struggle for existence would have been periodically severe to an extreme degree. Thus during these primordial times all the conditions for sexual selection would have been much more favourable than at a later period, when man had advanced in his intellectual powers, but had retrograded in his instincts. Therefore, whatever influence sexual selection may have had in producing the differences between the races of man, and between man and the higher Quadrumana, this influence would have been much more powerful at a very remote period than at the present day.[132]

Darwin worked forward from this idyllic period to one subtly different from the previous description based on Lubbock's book. In this imagined world, Darwin chose a tribal structure with a chief who 'generally have been able to select the more attractive women'. He went on to describe a different Eden in which sexual selection does take place:

> We have seen that each race has its own style of beauty, and we know that it is natural to man to admire each characteristic point in his domestic animals, dress, ornaments, and personal appearance, when carried a little beyond the common standard. If then the several foregoing propositions be admitted, and I cannot see that they are doubtful, it would be an inexplicable circumstance, if the selection of the more attractive women by the more powerful men of each tribe, who would rear on an average a greater number of children, did not after the lapse of many generations modify to a certain extent the character of the tribe.[133]

He went on to introduce the idea of unconscious selection using the analogy of the breeder who finds his animals reflect his own choices.

> With our domestic animals, when a foreign breed is introduced into a new country, or when a native breed is long and carefully attended to, either for use or ornament, it is found after several generations to have undergone, whenever the means of comparison exist, a greater or less amount of change. This follows from unconscious selection during a long series of generations—that is, the preservation of the most approved individuals—without any wish or expectation of such a result on the part of the breeder. So again, if two careful breeders rear during many years animals of the same family, and do not compare them together or with a common standard, the animals are found after a time to have become to the surprise of their owners slightly different. Each breeder has impressed, as Von Nathusius well expresses it, the character of his own mind—

[132] *ibid*., pp. 367-68.
[133] *ibid*., p. 369.

> his own taste and judgment—on his animals. What reason, then, can be assigned why similar results should not follow from the long-continued selection of the most admired women by those men of each tribe, who were able to rear to maturity the greater number of children? This would be unconscious selection, for an effect would be produced, independently of any wish or expectation on the part of the men who preferred certain women to others.[134]

Darwin argued that geographic dispersal of tribes in which sexual selection took place would result in 'greater and greater' differences in appearance.

> Let us suppose the members of a tribe, in which some form of marriage was practised, to spread over an unoccupied continent; they would soon split up into distinct hordes, which would be separated from each other by various barriers, and still more effectually by the incessant wars between all barbarous nations. The hordes would thus be exposed to slightly different conditions and habits of life, and would sooner or later come to differ in some small degree. As soon as this occurred, each isolated tribe would form for itself a slightly different standard of beauty; and then unconscious selection would come into action through the more powerful and leading savages preferring certain women to others.[135] Thus the differences between the tribes, at first very slight, would gradually and inevitably be increased to a greater and greater degree.[136]

Darwin argued that males would have been selected for both strength, through competition for females, and appearance, through female sexual selection. He then introduced the case of the Rhesus monkey where the female is more highly ornamented than the male.

> With animals in a state of nature, many characters proper to the males, such as size, strength, special weapons, courage and pugnacity, have been acquired through the law of battle. The semi-human progenitors of man, like their allies the Quadrumana, will almost certainly have been thus modified; and, as savages still fight for the possession of their women, a similar process of selection has probably gone on in a greater or less degree to the present day. Other characters proper to the males of the lower animals, such as bright colours and various ornaments, have been acquired by the more attractive males having been preferred by the females. There are, however, exceptional cases in which the males, instead of having been the selected, have been the selectors. We recognise such cases by the females having been rendered more highly ornamented than the males,—their ornamental characters having been transmitted exclusively or chiefly to their female offspring. One such case has been described in the order to which man belongs, namely, with the Rhesus monkey.[137]

Darwin argued from the Rhesus monkey to humans and male sexual selection based on the evidence of female decoration using the 'plumes of male birds'. It is here that Darwin justified female beauty resulting from sexual selection although the evidence seems to be anecdotal ('as most persons will admit').

> Man is more powerful in body and mind than woman, and in the savage state he keeps her in a far more abject state of bondage than does the male of any other

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[134] *ibid*., pp. 369-70.

[135] Darwin added the footnote, 'An ingenious writer argues, from a comparison of the pictures of Raphael, Rubens, and modern French artists, that the idea of beauty is not absolutely the same even throughout Europe: see the 'Lives of Haydn and Mozart,' by M. Bombet, English translator. p. 278.'

[136] Darwin, *Descent*, 1st edn (1871), II, pp. 370-71.

[137] *ibid*., p. 371.

> animal; therefore it is not surprising that he should have gained the power of selection. Women are everywhere conscious of the value of their beauty; and when they have the means, they take more delight in decorating themselves with all sorts of ornaments than do men. They borrow the plumes of male birds, with which nature decked this sex in order to charm the females. As women have long been selected for beauty, it is not surprising that some of the successive variations should have been transmitted in a limited manner; and consequently that women should have transmitted their beauty in a somewhat higher degree to their female than to their male offspring. Hence women have become more beautiful, as most persons will admit, than men. Women, however, certainly transmit most of their characters, including beauty, to their offspring of both sexes; so that the continued preference by the men of each race of the more attractive women, according to their standard of taste, would tend to modify in the same manner all the individuals of both sexes belonging to the race.[138]

He then used the more common case, in lower animals, of female selection to explain the male beard but relegates this to 'inheritance from an ancient progenitor'. He then described tribes in which the female selects the male based on appearance as 'utterly barbarous'.

> With respect to the other form of sexual selection (which with the lower animals is much the most common), namely, when the females are the selectors, and accept only those males which excite or charm them most, we have reason to believe that it formerly acted on the progenitors of man. Man in all probability owes his beard, and perhaps some other characters, to inheritance from an ancient progenitor who gained in this manner his ornaments. But this form of selection may have occasionally acted during later times; for in utterly barbarous tribes the women have more power in choosing, rejecting, and tempting their lovers, or of afterwards changing their husbands, than might have been expected. As this is a point of some importance, I will give in detail such evidence as I have been able to collect.[139]

Darwin gave ten examples where the female appears to have a limited ability to select or reject a male in an essentially male dominated selection process.

> We thus see that with savages the women are not in quite so abject a state in relation to marriage as has often been supposed. They can tempt the men whom they prefer, and can sometimes reject those whom they dislike, either before or after marriage. Preference on the part of the women, steadily acting in any one direction, would ultimately affect the character of the tribe; for the women would generally choose not merely the handsomer men, according to their standard of taste, but those who were at the same time best able to defend and support them. Such well-endowed pairs would commonly rear a larger number of offspring than the less well endowed. The same result would obviously follow in a still more marked manner if there was selection on both sides; that is if the more attractive, and at the same time more powerful men were to prefer, and were preferred by, the more attractive women. And these two forms of selection seem actually to have occurred, whether or not simultaneously, with mankind, especially during the earlier periods of our long history.[140]

Having established female selection and its consequence in attractive and more powerful men Darwin next went on to discuss the absence of hair on the body.

> From the presence of the woolly hair or lanugo on the human fœtus, and of rudimentary hairs scattered over the body during maturity, we may infer that man

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[138] *ibid*., pp. 371-72.
[139] *ibid*., p. 372.
[140] *ibid*., pp. 374-75.

> is descended from some animal which was born hairy and remained so during life. The loss of hair is an inconvenience and probably an injury to man even under a hot climate, for he is thus exposed to sudden chills, especially during wet weather. As Mr. Wallace remarks, the natives in all countries are glad to protect their naked backs and shoulders with some slight covering. No one supposes that the nakedness of the skin is any direct advantage to man, so that his body cannot have been divested of hair through natural selection.[141] Nor have we any grounds for believing, as shewn in a former chapter, that this can be due to the direct action of the conditions to which man has long been exposed, or that it is the result of correlated development.[142]

He argued that as women tend to be less hairy than men it must be a characteristics that evolved from the sexual selection of less hairy females by males.

> The absence of hair on the body is to a certain extent a secondary sexual character; for in all parts of the world women are less hairy than men. Therefore we may reasonably suspect that this is a character which has been gained through sexual selection. We know that the faces of several species of monkeys, and large surfaces at the posterior end of the body in other species, have been denuded of hair; and this we may safely attribute to sexual selection, for these surfaces are not only vividly coloured, but sometimes, as with the male mandrill and female rhesus, much more vividly in the one sex than in the other. As these animals gradually reach maturity the naked surfaces, as I am informed by Mr. Bartlett, grow larger, relatively to the size of their bodies. The hair, however, appears to have been removed in these cases, not for the sake of nudity, but that the colour of the skin should be more fully displayed. So again with many birds the head and neck have been divested of feathers through sexual selection, for the sake of exhibiting the brightly-coloured skin.[143]

As the lack of hair is common to all races, it must have taken place ‘at an extremely remote period’. The evolution of nudity is strange as it makes individuals less fitted to the environment but Darwin justified it as ‘innumerable strange characters have thus been esteemed’.

> As woman has a less hairy body than man, and as this character is common to all races, we may conclude that our female semi-human progenitors were probably first partially divested of hair; and that this occurred at an extremely remote period before the several races had diverged from a common stock. As our female progenitors gradually acquired this new character of nudity, they must have transmitted it in an almost equal degree to their young offspring of both sexes; so that its transmission, as in the case of many ornaments with mammals and birds, has, not been limited either by age or sex. There is nothing surprising in a partial loss of hair having been esteemed as ornamental by the ape-like progenitors of man, for we have seen that with animals of all kinds innumerable strange characters have been thus esteemed, and have consequently been modified

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[141] Darwin added the footnote ‘Contributions to the Theory of Natural Selection,' 1870, p. 346. Mr. Wallace believes (p. 350) ‘that some intelligent power has guided or determined the development of man;’ and he considers the hairless condition of the skin as coming under this head. The Rev. T. R. Stebbing, in commenting on this view ('Transactions of Devonshire Assoc. for Science,' 1870) remarks, that had Mr. Wallace ‘employed his usual ingenuity on the question of man's hairless skin, he might have seen the possibility of its selection through its superior beauty or the health attaching to superior cleanliness. At any rate it is surprising that he should picture to himself a superior intelligence plucking the hair from the backs of savage men (to whom, according to his own account it would have been useful and beneficial), in order that the descendants of the poor shorn wretches might after many deaths from cold and damp in the course of many generations, have been forced to raise themselves in the scale of civilisation through the practice of various arts, in the manner indicated by Mr. Wallace.’

[142] Darwin, *Descent*, 1st edn (1871), II, pp. 375-76.

[143] *ibid*., pp. 376-77.

> through sexual selection. Nor is it surprising that a character in a slight degree injurious should have been thus acquired; for we know that this is the case with the plumes of some birds, and with the horns of some stags.[144]

The Siamese hairy family Darwin referred to was suffering from the autosomal dominant syndrome congenital hypertrichosis lanuginose (see p. 66).

> The females of certain anthropoid apes, as stated in a former chapter, are somewhat less hairy on the under surface than are the males; and here we have what might have afforded a commencement for the process of denudation. With respect to the completion of the process through sexual selection, it is well to bear in mind the New Zealand proverb, "there is no woman for a hairy man." All who have seen photographs of the Siamese hairy family will admit how ludicrously hideous is the opposite extreme of excessive hairiness. Hence the king of Siam had to bribe a man to marry the first hairy woman in the family, who transmitted this character to her young offspring of both sexes.[145]

The first man suffering from this genetic defect was Shwe-Maong who married a wife 'chosen for him by the King from the beautiful women of his retinue'.[146] However, Darwin was correct in that it was transmitted to both sexes.

Darwin then dealt with an issue regarding what was later called degeneracy. If humans were originally hairy and became naked through sexual selection then the hairy races, such as Europeans, must be more primitive. Darwin dismissed this 'partial reversion' as of a minor nature and at the end of the paragraph dismissed it further as extremely variable and not remarkable. It is interesting to speculate what Darwin would have written if Europeans had been more hairless.

> Some races are much more hairy than others, especially on the male side; but it must not be assumed that the more hairy races, for instance Europeans, have retained a primordial condition more completely than have the naked races, such as the Kalmucks or Americans. It is a more probable view that the hairiness of the former is due to partial reversion, for characters which have long been inherited are always apt to return. It does not appear that a cold climate has been influential in leading to this kind of reversion; excepting perhaps with the negroes, who have been reared during several generations, in the United States, and possibly with the Ainos, who inhabit the northern islands of the Japan archipelago. But the laws of inheritance are so complex than we can seldom understand their action. If the greater hairiness of certain races be the result of reversion, unchecked by any form of selection, the extreme variability of this character, even within the limits of the same race, ceases to be remarkable.[147]

Darwin described the male beard as sexually selected as it is only in the male and develops at maturity. He also described the beard as an example of reversion, or what would later be called degeneracy, and used it as an example of the variability between races of characteristics regarded as sexually attractive.

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[144] *ibid*., p. 377.
[145] *ibid*., pp. 377-78.
[146] Bondeson and Miles, 'The Hairy Family of Burma: A Four Generation Pedigree of Congenital Hypertrichosis Lanuginosa', *Journal of the Royal Society of Medicine,* 89 (July, 1996), 403-08 (p. 403).
[147] Darwin, *Descent*, 1st edn (1871), II, pp. 378-79.

> With respect to the beard, if we turn to our best guide, namely the Quadrumana, we find beards equally well developed in both sexes of many species, but in others, either confined to the males, or more developed in them than in the females. From this fact, and from the curious arrangement, as well as the bright colours, of the hair about the heads of many monkeys, it is highly probable, as before explained, that the males first acquired their beards as an ornament through sexual selection, transmitting them in most cases, in an equal or nearly equal degree, to their offspring of both sexes. We know from Eschricht that with mankind, the female as well as the male fœtus is furnished with much hair on the face, especially round the mouth; and this indicates that we are descended from a progenitor, of which both sexes were bearded. It appears therefore at first sight probable that man has retained his beard from a very early period, whilst woman lost her beard at the same time when her body became almost completely divested of hair. Even the colour of the beard with mankind seems to have been inherited from an ape-like progenitor; for when there is any difference in tint between the hair of the head and the beard, the latter is lighter coloured in all monkeys and in man. There is less improbability in the men of the bearded races having retained their beards from primordial times, than in the case of the hair on the body; for with those Quadrumana, in which the male has a larger beard than that of the female, it is fully developed only at maturity, and the later stages of development may have been exclusively transmitted to mankind. We should then see what is actually the case, namely, our male children, before they arrive at maturity, as destitute of beards as are our female children. On the other hand the great variability of the beard within the limits of the same race and in different races indicates that reversion has come into action. However this may be, we must not overlook the part which sexual selection may have played even during later times; for we know that with savages, the men of the beardless races take infinite pains in eradicating every hair from their faces, as something odious, whilst the men of the bearded races feel the greatest pride in their beards. The women, no doubt, participate in these feelings, and if so sexual selection can hardly have failed to have effected something in the course of later times.[148]

Darwin describes hair length as sexually selected although it occurs in both sexes but not all races.

> It is rather difficult to form a judgment how the long hair on our heads became developed. Eschricht states that in the human fœtus the hair on the face during the fifth month is longer than that on the head; and this indicates that our semi-human progenitors were not furnished with long tresses, which consequently must have been a late acquisition. This is likewise indicated by the extraordinary difference in the length of the hair in the different races; in the negro the hair forms a mere curly mat; with us it is of great length, and with the American natives it not rarely reaches to the ground. Some species of Semnopithecus [grey langur monkeys from India] have their heads covered with moderately long hair, and this probably serves as an ornament and was acquired through sexual selection. The same view may be extended to mankind, for we know that long tresses are now and were formerly much admired, as may be observed in the works of almost every poet; St. Paul says, "if a woman have long hair, it is a glory

[148] *ibid*., pp. 379-80. Darwin added the footnote, ‘Mr. Sproat ('Scenes and Studies of Savage Life,' 1868, p. 25) suggests, with reference to the beardless natives of Vancouver's Island, that the custom of plucking out the hairs on the face, "continued from one generation to another, would perhaps at last produce a race distinguishable by a thin and straggling growth of beard." But the custom would not have arisen until the beard had already become, from some independent cause, greatly reduced. Nor have we any direct evidence that the continued eradication of the hair would lead to any inherited effect. Owing to this cause of doubt, I have not hitherto alluded to the belief held by some distinguished ethnologists, for instance M. Gosse of Geneva, that artificial modifications of the skull tend to be inherited. I have no wish to dispute this conclusion; and we now know from Dr. Brown-Séquard's remarkable observations, especially those recently communicated (1870) to the British Association, that with guinea-pigs the effects of operations are inherited.’

> to her;" and we have seen that in North America a chief was elected solely from the length of his hair.[149]

The colour of the skin is thought not to be due to sexual selection as the skin colour is the same in both sexes. However, the attractiveness of skin colour suggests it could be sexually selected although Darwin seemed to consider black skin unattractive and suggested that the Brazilian monkey Pithecia Satanas resembles a black person. *The Penny Cyclopaedia* from which Darwin probably extracted this information actually makes the claim about Pithecia Melanocephala 'reminding the spectator of an old negro', although this text is immediately underneath an illustration of Pithecia Satanas, which may explain his mistake.[150]

> The best kind of evidence that the colour of the skin has been modified through sexual selection is wanting in the case of mankind; for the sexes do not differ in this respect, or only slightly and doubtfully. On the other hand we know from many facts already given that the colour of the skin is regarded by the men of all races as a highly important element in their beauty; so that it is a character which would be likely to be modified through selection, as has occurred in innumerable instances with the lower animals. It seems at first sight a monstrous supposition that the jet blackness of the negro has been gained through sexual selection; but this view is supported by various analogies, and we know that negroes admire their own blackness. With mammals, when the sexes differ in colour, the male is often black or much darker than the female; and it depends merely on the form of inheritance whether this or any other tint shall be transmitted to both sexes or to one alone. The resemblance of Pithecia satanas with his jet black skin, white rolling eyeballs, and hair parted on the top of the head, to a negro in miniature, is almost ludicrous.[151]

Darwin summarised the chapter by saying man's characteristics were acquired in 'primeval times' and have been augmented by male rivalry. The 'greater intellectual vigour and power of invention in man' (I assume he means men) he associated with natural selection. The male ape-like progenitor acquired beards to 'excite the opposite sex' and females were 'denuded of hair' as a sexual ornament but this attribute was transmitted almost equally to both sexes. He also explained women's 'sweeter voices' and greater beauty as a result of sexual selection.

'Early times', he thought were a period when humans were 'guided more by his instinctive passions, and less by foresight or reason' and when sexual selection could take place as people were not 'so utterly licentious', 'each male would have jealously guarded his wife or wives', 'he would not then have practised infanticide; nor valued wives merely as useful slaves; nor have been betrothed to them during infancy'.

> Hence we may infer that the races of men were differentiated, as far as sexual selection is concerned, in chief part during a very remote epoch; and this conclusion throws light on the remarkable fact that at the most ancient period, of

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149 *ibid*., pp. 380-81.

150 We know Darwin read the encyclopaedia as he quoted it on page 320, footnote 10 of D*escent of Man.* The edition quoted here is *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* (London: Charles Knight, 1841), 20, p. 324.

151 Darwin, *Descent*, 1st edn (1871), II, pp. 381-82.

> which we have as yet obtained any record, the races of man had already come to differ nearly or quite as much as they do at the present day.[152]

Darwin admitted that we cannot say which characteristics have been sexually selected but that the wide variety of attributes regarded as attractive by each tribe suggests that they were gradually selected over many generations.

> The views here advanced, on the part which sexual selection has played in the history of man, want scientific precision. He who does not admit this agency in the case of the lower animals, will properly disregard all that I have written in the later chapters on man. We cannot positively say that this character, but not that, has been thus modified; it has, however, been shewn that the races of man differ from each other and from their nearest allies amongst the lower animals, in certain characters which are of no service to them in their ordinary habits of life, and which it is extremely probable would have been modified through sexual selection. We have seen that with the lowest savages the people of each tribe admire their own characteristic qualities,—the shape of the head and face, the squareness of the cheek-bones, the prominence or depression of the nose, the colour of the skin, the length of the hair on the head, the absence of hair on the face and body, or the presence of a great beard, and so forth. Hence these and other such points could hardly fail to have been slowly and gradually exaggerated from the more powerful and able men in each tribe, who would succeed in rearing the largest number of offspring, having selected during many generations as their wives the most strongly characterised and therefore most attractive women. For my own part I conclude that of all the causes which have led to the differences in external appearance between the races of man, and to a certain extent between man and the lower animals, sexual selection has been by far the most efficient.[153]

General Summary and Conclusions

The final twenty pages of the book summarize the findings. The most important point he makes is that 'man is the co-descendant with other mammals of a common progenitor'.

> The main conclusion arrived at in this work, and now held by many naturalists who are well competent to form a sound judgment, is that man is descended from some less highly organised form. The grounds upon which this conclusion rests will never be shaken, for the close similarity between man and the lower animals in embryonic development, as well as in innumerable points of structure and constitution, both of high and of the most trifling importance,—the rudiments which he retains, and the abnormal reversions to which he is occasionally liable,—are facts which cannot be disputed. They have long been known, but until recently they told us nothing with respect to the origin of man. Now when viewed by the light of our knowledge of the whole organic world, their meaning is unmistakeable. The great principle of evolution stands up clear and firm, when these groups of facts are considered in connection with others, such as the mutual affinities of the members of the same group, their geographical distribution in past and present times, and their geological succession. It is incredible that all these facts should speak falsely. He who is not content to look, like a savage, at the phenomena of nature as disconnected, cannot any longer believe that man is the work of a separate act of creation. He will be forced to admit that the close resemblance of the embryo of man to that, for instance, of a dog—the construction of his skull, limbs, and whole frame, independently of the uses to which the parts may be put, on the same plan with that of other mammals—the occasional reappearance of various structures, for instance of several distinct muscles, which man does not normally possess, but which are common to the

[152] *ibid*., p. 383.
[153] *ibid*., pp. 383-84.

> Quadrumana—and a crowd of analogous facts—all point in the plainest manner to the conclusion that man is the co-descendant with other mammals of a common progenitor.[154]

He went on to make what appears to be a Lamarckian statement:

> We may feel assured that the inherited effects of the long-continued use or disuse of parts will have done much in the same direction with natural selection. […] Something may be attributed to the direct and definite action of the surrounding conditions of life, such as abundant food, heat, or moisture [155]

He considered the idea that races may be sub-species but concluded that all the races had a 'common progenitor' that would 'rank as man'.

> Through the means just specified, aided perhaps by others as yet undiscovered, man has been raised to his present state. But since he attained to the rank of manhood, he has diverged into distinct races, or as they may be more appropriately called sub-species. Some of these, for instance the Negro and European, are so distinct that, if specimens had been brought to a naturalist without any further information, they would undoubtedly have been considered by him as good and true species. Nevertheless all the races agree in so many unimportant details of structure and in so many mental peculiarities, that these can be accounted for only through inheritance from a common progenitor; and a progenitor thus characterised would probably have deserved to rank as man.[156]

Darwin then seemed to make the point that there was no single pair that gave rise to the human race although there is always a 'Most Recent Common Ancestor'.[157]

> It must not be supposed that the divergence of each race from the other races, and of all the races from a common stock, can be traced back to any one pair of progenitors. On the contrary, at every stage in the process of modification, all the individuals which were in any way best fitted for their conditions of life, though in different degrees, would have survived in greater numbers than the less well fitted.[158]

The following paragraph appears to be the one that gave rise to the caricatures of Darwin shown with a tail and of the cartoons showing an evolutionary sequence with one object gradually transmuting into another over a series of intermediate stages.

> By considering the embryological structure of man,—the homologies which he presents with the lower animals,—the rudiments which he retains,—and the reversions to which he is liable, we can partly recall in imagination the former condition of our early progenitors; and can approximately place them in their proper position in the zoological series. We thus learn that man is descended from a hairy quadruped, furnished with a tail and pointed ears, probably arboreal in its habits, and an inhabitant of the Old World. This creature, if its whole structure had been examined by a naturalist, would have been classed amongst the Quadrumana, as surely as would the common and still more ancient progenitor of the Old and New World monkeys. The Quadrumana and all the higher mammals are probably derived from an ancient marsupial animal, and this through a long line of diversified forms, either from some reptile-like or some amphibian-like creature, and this again from some fish-like animal. In the dim

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154 *ibid*., pp. 385-86.
155 *ibid*., p. 387.
156 *ibid*., p. 388.
157 The Most Recent Common Ancestor is discussed in Richard Dawkins and Yan Wong, *The Ancestor's Tale: A Pilgrimage to the Dawn of Evolution* (New York: First Mariner Books, 2005), pp. 41-47.
158 Darwin, *Descent*, 1st edn (1871), II, p. 388.

> obscurity of the past we can see that the early progenitor of all the Vertebrata must have been an aquatic animal, provided with branchiæ, with the two sexes united in the same individual, and with the most important organs of the body (such as the brain and heart) imperfectly developed. This animal seems to have been more like the larvæ of our existing marine Ascidians than any other known form.[159]

Darwin explained how the lower animals could through gradual steps evolve into humans and he then considered some human attributes, such as tool making and language. He went on to consider the 'moral qualities' which arose from 'social instincts' of love and sympathy which are 'highly beneficial to the species' and so 'they have in all probability been acquired through natural selection'. He considered that what we mean by conscience is when we resolve to act differently in future if our 'temporary desire or passion' master our 'social instincts' leaving a 'sense of dissatisfaction'. As humans are able to express desires in words motives are influenced by praise and blame which are in turn based on the social instinct, sympathy.

> As all men desire their own happiness, praise or blame is bestowed on actions and motives, according as they lead to this end; and as happiness is an essential part of the general good, the greatest-happiness principle indirectly serves as a nearly safe standard of right and wrong. As the reasoning powers advance and experience is gained, the more remote effects of certain lines of conduct on the character of the individual, and on the general good, are perceived; and then the self-regarding virtues, from coming within the scope of public opinion, receive praise, and their opposites receive blame. But with the less civilised nations reason often errs, and many bad customs and base superstitions come within the same scope, and consequently are esteemed as high virtues, and their breach as heavy crimes.[160]

Darwin argued that education and stimulating the intellectual faculties would enable past impressions to be more readily recalled leading to a reinforcement of conscience and therefore improving our moral character:

> The moral faculties are generally esteemed, and with justice, as of higher value than the intellectual powers. But we should always bear in mind that the activity of the mind in vividly recalling past impressions is one of the fundamental though secondary bases of conscience. This fact affords the strongest argument for educating and stimulating in all possible ways the intellectual faculties of every human being. No doubt a man with a torpid mind, if his social affections and sympathies are well developed, will be led to good actions, and may have a fairly sensitive conscience. But whatever renders the imagination of men more vivid and strengthens the habit of recalling and comparing past impressions, will make the conscience more sensitive, and may even compensate to a certain extent for weak social affections and sympathies.[161]

Darwin therefore explained moral conscience through strictly evolutionary terms before introducing 'an all-seeing Deity' as a form of more sophisticated social control.

> The moral nature of man has reached the highest standard as yet attained, partly through the advancement of the reasoning powers and consequently of a just public opinion, but especially through the sympathies being rendered more tender

[159] *ibid*., pp. 389-90.
[160] *ibid*., p. 393.
[161] *ibid*., pp. 393-94.

> and widely diffused through the effects of habit, example, instruction, and reflection. It is not improbable that virtuous tendencies may through long practice be inherited. With the more civilised races, the conviction of the existence of an all-seeing Deity has had a potent influence on the advancement of morality. Ultimately man no longer accepts the praise or blame of his fellows as his chief guide, though few escape this influence, but his habitual convictions controlled by reason afford him the safest rule. His conscience then becomes his supreme judge and monitor. Nevertheless the first foundation or origin of the moral sense lies in the social instincts, including sympathy; and these instincts no doubt were primarily gained, as in the case of the lower animals, through natural selection.[162]

He then considered the origins of our believe in God and explained that it is not innate but a result of a 'long-continued culture'.

> The belief in God has often been advanced as not only the greatest, but the most complete of all the distinctions between man and the lower animals. It is however impossible, as we have seen, to maintain that this belief is innate or instinctive in man. On the other hand a belief in all-pervading spiritual agencies seems to be universal; and apparently follows from a considerable advance in the reasoning powers of man, and from a still greater advance in his faculties of imagination, curiosity and wonder. I am aware that the assumed instinctive belief in God has been used by many persons as an argument for His existence. But this is a rash argument, as we should thus be compelled to believe in the existence of many cruel and malignant spirits, possessing only a little more power than man; for the belief in them is far more general than of a beneficent Deity. The idea of a universal and beneficent Creator of the universe does not seem to arise in the mind of man, until he has been elevated by long-continued culture.[163]

He also considered how the belief in the immortality of the soul might have arisen and pointed out that it is by no means clear when an individual becomes immortal or which of our ancestral species became immortal.

> He who believes in the advancement of man from some lowly-organised form, will naturally ask how does this bear on the belief in the immortality of the soul. The barbarous races of man, as Sir J. Lubbock has shewn, possess no clear belief of this kind; but arguments derived from the primeval beliefs of savages are, as we have just seen, of little or no avail. Few persons feel any anxiety from the impossibility of determining at what precise period in the development of the individual, from the first trace of the minute germinal vesicle to the child either before or after birth, man becomes an immortal being; and there is no greater cause for anxiety because the period in the gradually ascending organic scale cannot possibly be determined.[164]

He summarised the conclusions regarding sexual selection.

> In the most distinct classes of the animal kingdom, with mammals, birds, reptiles, fishes, insects, and even crustaceans, the differences between the sexes follow almost exactly the same rules. The males are almost always the wooers; and they alone are armed with special weapons for fighting with their rivals. They are generally stronger and larger than the females, and are endowed with the requisite qualities of courage and pugnacity. They are provided, either exclusively or in a much higher degree than the females, with organs for producing vocal or instrumental music, and with odoriferous glands. They are ornamented with infinitely diversified appendages, and with the most brilliant or conspicuous colours, often arranged in elegant patterns, whilst the females are left unadorned. When the sexes differ in more important structures, it is the male which is provided with special sense-organs for discovering the female, with locomotive

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[162] *ibid*., p. 394.
[163] *ibid*., pp. 394-95.
[164] *ibid*., p. 395.

> organs for reaching her, and often with prehensile organs for holding her. These various structures for securing or charming the female are often developed in the male during only part of the year, namely the breeding season. They have in many cases been transferred in a greater or less degree to the females; and in the latter case they appear in her as mere rudiments. They are lost by the males after emasculation. Generally they are not developed in the male during early youth, but appear a short time before the age for reproduction. Hence in most cases the young of both sexes resemble each other; and the female resembles her young offspring throughout life. In almost every great class a few anomalous cases occur in which there has been an almost complete transposition of the characters proper to the two sexes; the females assuming characters which properly belong to the males. This surprising uniformity in the laws regulating the differences between the sexes in so many and such widely separated classes, is intelligible if we admit the action throughout all the higher divisions of the animal kingdom of one common cause, namely sexual selection.[165]

Darwin then summarised natural selection and the two types of sexual selection.

> Sexual selection depends on the success of certain individuals over others of the same sex in relation to the propagation of the species; whilst natural selection depends on the success of both sexes, at all ages, in relation to the general conditions of life. The sexual struggle is of two kinds; in the one it is between the individuals of the same sex, generally the male sex, in order to drive away or kill their rivals, the females remaining passive; whilst in the other, the struggle is likewise between the individuals of the same sex, in order to excite or charm those of the opposite sex, generally the females, which no longer remain passive, but select the more agreeable partners. This latter kind of selection is closely analogous to that which man unintentionally, yet effectually, brings to bear on his domesticated productions, when he continues for a long time choosing the most pleasing or useful individuals, without any wish to modify the breed.[166]

Darwin speculated on the 'laws of inheritance' although little was known at the time about how characteristics were inherited.

> The laws of inheritance determine whether characters gained through sexual selection by either sex shall be transmitted to the same sex, or to both sexes; as well as the age at which they shall be developed. It appears that variations which arise late in life are commonly transmitted to one and the same sex. Variability is the necessary basis for the action of selection, and is wholly independent of it. It follows from this, that variations of the same general nature have often been taken advantage of and accumulated through sexual selection in relation to the propagation of the species, and through natural selection in relation to the general purposes of life. Hence secondary sexual characters, when equally transmitted to both sexes can be distinguished from ordinary specific characters only by the light of analogy. The modifications acquired through sexual selection are often so strongly pronounced that the two sexes have frequently been ranked as distinct species, or even as distinct genera. Such strongly-marked differences must be in some manner highly important; and we know that they have been acquired in some instances at the cost not only of inconvenience, but of exposure to actual danger.[167]

Darwin described the mechanism of sexual selection and pointed out that in most cases it is the male that is selected.

> The belief in the power of sexual selection rests chiefly on the following considerations. The characters which we have the best reason for supposing to have been thus acquired are confined to one sex; and this alone renders it

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[165] *ibid*., pp. 396-97.
[166] *ibid*., p. 398.
[167] *ibid*., pp. 398-99.

> probable that they are in some way connected with the act of reproduction. These characters in innumerable instances are fully developed only at maturity; and often during only a part of the year, which is always the breeding-season. The males (passing over a few exceptional cases) are the most active in courtship; they are the best armed, and are rendered the most attractive in various ways. It is to be especially observed that the males display their attractions with elaborate care in the presence of the females; and that they rarely or never display them excepting during the season of love. It is incredible that all this display should be purposeless. Lastly we have distinct evidence with some quadrupeds and birds that the individuals of the one sex are capable of feeling a strong antipathy or preference for certain individuals of the opposite sex.[168]

He explained that the attractiveness of males resulted from the consistent selection by discerning females over many generations. This consistent standard of beauty implies that taste is inherited by the female.

> Bearing these facts in mind, and not forgetting the marked results of man's unconscious selection, it seems to me almost certain that if the individuals of one sex were during a long series of generations to prefer pairing with certain individuals of the other sex, characterised in some peculiar manner, the offspring would slowly but surely become modified in this same manner. I have not attempted to conceal that, excepting when the males are more numerous than the females, or when polygamy prevails, it is doubtful how the more attractive males succeed in leaving a larger number of off-spring to inherit their superiority in ornaments or other charms than the less attractive males; but I have shewn that this would probably follow from the females,—especially the more vigorous females which would be the first to breed, preferring not only the more attractive but at the same time the more vigorous and victorious males.[169]

Darwin then recognized that such inherited taste appeared astonishing, particularly in fish and insects but it is supported by the evidence. The discernment is so strong that peahens prevented from mating with an admired peacock ‘remain widows during a whole season’.

> Although we have some positive evidence that birds appreciate bright and beautiful objects, as with the Bower-birds of Australia, and although they certainly appreciate the power of song, yet I fully admit that it is an astonishing fact that the females of many birds and some mammals should be endowed with sufficient taste for what has apparently been effected through sexual selection; and this is even more astonishing in the case of reptiles, fish, and insects. But we really know very little about the minds of the lower animals. It cannot be supposed that male Birds of Paradise or Peacocks, for instance, should take so much pains in erecting, spreading, and vibrating their beautiful plumes before the females for no purpose. We should remember the fact given on excellent authority in a former chapter, namely that several peahens, when debarred from an admired male, remained widows during a whole season rather than pair with another bird.[170]

The case of the Argus pheasant is interesting as the feathers appear three-dimensional, almost as if they have been painted by an artist:

> Nevertheless I know of no fact in natural history more wonderful than that the female Argus pheasant should be able to appreciate the exquisite shading of the ball-and-socket ornaments and the elegant patterns on the wing-feathers of the male. He who thinks that the male was created as he now exists must admit that the great plumes, which prevent the wings from being used for flight, and which,

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[168] *ibid*., p. 399.
[169] *ibid*., pp. 399-400.
[170] *ibid*., p. 400.

> as well as the primary feathers, are displayed in a manner quite peculiar to this one species during the act of courtship, and at no other time, were given to him as an ornament. If so, he must likewise admit that the female was created and endowed with the capacity of appreciating such ornaments. I differ only in the conviction that the male Argus pheasant acquired his beauty gradually, through the females having preferred during many generations the more highly ornamented males; the æsthetic capacity of the females having been advanced through exercise or habit in the same manner as our own taste is gradually improved. In the male, through the fortunate chance of a few feathers not having been modified, we can distinctly see how simple spots with a little fulvous shading on one side might have been developed by small and graduated steps into the wonderful ball-and-socket ornaments; and it is probable that they were actually thus developed.[171]

Darwin speculated that we admire the plumage of birds and other vertebrates as we have a similar structure of nerve cells because of our common ancestry.

> Everyone who admits the principle of evolution, and yet feels great difficulty in admitting that female mammals, birds, reptiles, and fish, could have acquired the high standard of taste which is implied by the beauty of the males, and which generally coincides with our own standard, should reflect that in each member of the vertebrate series the nerve-cells of the brain are the direct offshoots of those possessed by the common progenitor of the whole group. It thus becomes intelligible that the brain and mental faculties should be capable under similar conditions of nearly the same course of development, and consequently of performing nearly the same functions.[172]

He pointed out that as sexual selection involves taste, discernment and selection the development of the mind ('the cerebral system') went hand-in-hand with the bodily structures selected:

> He who admits the principle of sexual selection will be led to the remarkable conclusion that the cerebral system not only regulates most of the existing functions of the body, but has indirectly influenced the progressive development of various bodily structures and of certain mental qualities. Courage, pugnacity, perseverance, strength and size of body, weapons of all kinds, musical organs, both vocal and instrumental, bright colours, stripes and marks, and ornamental appendages, have all been indirectly gained by the one sex or the other, through the influence of love and jealousy, through the appreciation of the beautiful in sound, colour or form, and through the exertion of a choice; and these powers of the mind manifestly depend on the development of the cerebral system.[173]

Darwin then considered the consequences of selecting a person 'inferior in body or mind' and first suggested that both sexes 'ought to refrain from marriage'. He thought that this would be unlikely to happen and suggested more research into the principles of inheritance followed by legislation based on whether closely related people should marry. We know Darwin was concerned about whether his own children were more susceptible to disease because he married his first cousin Emma Wedgwood (they both shared the same grandparents, Josiah and Sarah Wedgwood).

> Man scans with scrupulous care the character and pedigree of his horses, cattle, and dogs before he matches them; but when he comes to his own marriage he rarely, or never, takes any such care. He is impelled by nearly the same motives

[171] *ibid*., pp. 400-01.
[172] *ibid*., pp. 401-02.
[173] *ibid*., p. 402.

> as are the lower animals when left to their own free choice, though he is in so far superior to them that he highly values mental charms and virtues. On the other hand he is strongly attracted by mere wealth or rank. Yet he might by selection do something not only for the bodily constitution and frame of his offspring, but for their intellectual and moral qualities. Both sexes ought to refrain from marriage if in any marked degree inferior in body or mind; but such hopes are Utopian and will never be even partially realised until the laws of inheritance are thoroughly known. All do good service who aid towards this end. When the principles of breeding and of inheritance are better understood, we shall not hear ignorant members of our legislature rejecting with scorn a plan for ascertaining by an easy method whether or not consanguineous marriages are injurious to man.[174]

He then recommended that the poor should not marry but was concerned that, as Galton pointed out, if the reckless marry then 'inferior members will tend to supplant the better members of society'. He explained that the moral qualities are advanced more through habit and instruction than natural selection but our moral sense is based on 'social instincts' which are inherited.

> The advancement of the welfare of mankind is a most intricate problem: all ought to refrain from marriage who cannot avoid abject poverty for their children; for poverty is not only a great evil, but tends to its own increase by leading to recklessness in marriage. On the other hand, as Mr. Galton has remarked, if the prudent avoid marriage, whilst the reckless marry, the inferior members will tend to supplant the better members of society. Man, like every other animal, has no doubt advanced to his present high condition through a struggle for existence consequent on his rapid multiplication; and if he is to advance still higher he must remain subject to a severe struggle. Otherwise he would soon sink into indolence, and the more highly-gifted men would not be more successful in the battle of life than the less gifted. Hence our natural rate of increase, though leading to many and obvious evils, must not be greatly diminished by any means. There should be open competition for all men; and the most able should not be prevented by laws or customs from succeeding best and rearing the largest number of offspring. Important as the struggle for existence has been and even still is, yet as far as the highest part of man's nature is concerned there are other agencies more important. For the moral qualities are advanced, either directly or indirectly, much more through the effects of habit, the reasoning powers, instruction, religion, &c., than through natural selection; though to this latter agency the social instincts, which afforded the basis for the development of the moral sense, may be safely attributed.[175]

Darwin preferred to be descended from a heroic monkey or baboon than be associated with the 'savage who delights to torture his enemies':

> The main conclusion arrived at in this work, namely that man is descended from some lowly-organised form, will, I regret to think, be highly distasteful to many persons. But there can hardly be a doubt that we are descended from barbarians. The astonishment which I felt on first seeing a party of Fuegians on a wild and broken shore will never be forgotten by me, for the reflection at once rushed into my mind—such were our ancestors. These men were absolutely naked and bedaubed with paint, their long hair was tangled, their mouths frothed with excitement, and their expression was wild, startled, and distrustful. They possessed hardly any arts, and like wild animals lived on what they could catch; they had no government, and were merciless to every one not of their own small tribe. He who has seen a savage in his native land will not feel much shame, if forced to acknowledge that the blood of some more humble creature flows in his veins. For my own part I would as soon be descended from that heroic little monkey, who braved his dreaded enemy in order to save the life of his keeper; or

[174] *ibid*., pp. 402-03.
[175] *ibid*., pp. 403-04.

> from that old baboon, who, descending from the mountains, carried away in triumph his young comrade from a crowd of astonished dogs—as from a savage who delights to torture his enemies, offers up bloody sacrifices, practises infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions.[176]

And he ended with a Shakespearian summary.[177]

> […] man with all his noble qualities, with sympathy which feels for the most debased, with benevolence which extends not only to other men but to the humblest living creature, with his god-like intellect which has penetrated into the movements and constitution of the solar system—with all these exalted powers—Man still bears in his bodily frame the indelible stamp of his lowly origin.[178]

Darwin Descent of Man, Second Edition, 1872

Darwin extended the first paragraph in the Section 'Sense of Beauty'.

> Sense of Beauty.—This sense has been declared to be peculiar to man. I refer here only to the pleasure given by certain colours, forms, and sounds, and which may fairly be called a sense of the beautiful; with cultivated men such sensations are, however, intimately associated with complex ideas and trains of thought. 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. As we shall see later, the nests of humming-birds, and the playing passages of bower-birds are tastefully ornamented with gaily-coloured objects; and this shews that they must receive some kind of pleasure from the sight of such things. With the great majority of animals, however, the taste for the beautiful is confined, as far as we can judge, to the attractions of the opposite sex. The sweet strains poured forth by many male birds during the season of love, are certainly admired by the females, of which fact evidence will hereafter be given. If female birds had been incapable of appreciating the beautiful colours, the ornaments, and voices of their male partners, all the labour and anxiety exhibited by the latter in displaying their charms before the females would have been thrown away; and this it is impossible to admit. Why certain bright colours should excite pleasure cannot, I presume, be explained, any more than why certain flavours and scents are agreeable; but habit has something to do with the result, for that which is at first unpleasant to our senses, ultimately becomes pleasant, and habits are inherited. With respect to sounds, Helmholtz has explained to a certain extent on physiological principles, why harmonies and certain cadences are agreeable. But besides this, sounds frequently recurring at irregular intervals are highly disagreeable, as every one will admit who has listened at night to the irregular flapping of a rope on board ship. The same principle seems to come into play with vision, as the eye prefers symmetry or figures with some regular recurrence. Patterns of this kind are employed by even the lowest savages as ornaments; and they have been developed through sexual selection for the adornment of some male animals. Whether we can or not give any reason for the pleasure thus derived from vision and hearing, yet man and many of the lower animals are alike pleased by the same colours, graceful shading and forms, and the same sounds.
>
> The taste for the beautiful, at least as far as female beauty is concerned, is not of a special nature in the human mind; for it differs widely in the different races of man, and is not quite the same even in the different nations of the same race.

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[176] *ibid*., pp. 404-05.

[177] Shakespeare, *Hamlet, Prince of Denmark*, Act II, scene II, 'What a piece of work is a man, how noble in reason, how infinite in faculty, in form and moving how express and admirable, in action, how like an angel, in apprehension, how like a god: the beauty of the world, the paragon of animals—and yet, to me, what is this quintessence of dust?'

[178] Darwin, *Descent*, 1st edn (1871), II, p. 405.

> Judging from the hideous ornaments, and the equally hideous music admired by most savages, it might be urged that their æsthetic faculty was not so highly developed as in certain animals, for instance, as in birds. Obviously no animal would be capable of admiring such scenes as the heavens at night, a beautiful landscape, or refined music; but such high tastes are acquired through culture, and depend on complex associations; they are not enjoyed by barbarians or by uneducated persons.
>
> Many of the faculties, which have been of inestimable service to man for his progressive advancement, such as the powers of the imagination, wonder, curiosity, an undefined sense of beauty, a tendency to imitation, and the love of excitement or novelty, could hardly fail to lead to capricious changes of customs and fashions. I have alluded to this point, because a recent writer has oddly fixed on Caprice "as one of the most remarkable and typical differences between savages and brutes." But not only can we partially understand how it is that man is from various conflicting influences rendered capricious, but that the lower animals are, as we shall hereafter see, likewise capricious in their affections, aversions, and sense of beauty. There is also reason to suspect that they love novelty, for it [*sic*] own sake. [179]

The Expression of the Emotions in Man and Animals (1872)

There are only six occurrences of the word beauty in the first edition of *Expression of the Emotions*. The second edition of 1890 has one extra occurrence in a footnote but it was used descriptively.

The first two occur when Darwin listed the various ways he went about his research into the expression of emotions:

> Fourthly, I had hoped to derive much aid from the great masters in painting and sculpture, who are such [15] close observers. Accordingly, I have looked at photographs and engravings of many well-known works; but, with a few exceptions, have not thus profited. The reason no doubt is, that in works of art, beauty is the chief object; and strongly contracted facial muscles destroy beauty. The story of the composition is generally told with wonderful force and truth by skilfully given accessories.[180]

The third is when he referred to the Laocoön to point out what he regarded as an anatomical mistake:

> The ancient Greek sculptors were familiar with the expression, as shown in the statues of the Laocoön and Arrotino; but, as Duchenne remarks, they carried the transverse furrows across the whole breadth of the forehead, and thus committed a great anatomical mistake: this is likewise the case in some modern statues. It is, however, more probable that these wonderfully accurate observers intentionally sacrificed truth for the [185] sake of beauty, than that they made a mistake; for rectangular furrows on the forehead would not have had a grand appearance on the marble. The expression, in its fully developed condition, is, as far as I can discover, not often represented in pictures by the old masters, no doubt owing to the same cause; but a lady who is perfectly familiar with this expression, informs me that in Fra Angelico's 'Descent from the Cross,' in Florence, it is clearly exhibited in one of the figures on the right-hand; and I could add a few other instances.[181]

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[179] Darwin, *Descent*, 2nd, tenth thousand edn (1874), pp. 92-93.
[180] Darwin, *Expression, 1st Edn* (1872), pp. 14-15.
[181] *ibid*., pp. 184-85.

The fourth points out that the face is ‘the chief seat of beauty and of ugliness, and throughout the world is the most ornamented.[182]

In the section on blushing where Darwin points out that it is difficult to explain why it would have been designed by the Creator, particularly as it is not visible in dark-skinned races, he adds, ‘No doubt a slight blush adds to the beauty of a maiden's face; and the Circassian women who are capable of blushing, invariably fetch a higher price in the seraglio of the Sultan than less susceptible women’.[183] At the end of the section on blushing he adds, ‘It can hardly be doubted that many animals are capable of appreciating beautiful colours and even forms, as is shown by the pains which the individuals of one sex take in displaying their beauty before those of the opposite sex’.[184]

The Effects of Cross and Self Fertilisation in the Vegetable Kingdom (1876)

There are four occurrences of the word ‘beauty’ but they are all used descriptively.

The Various Contrivances by Which Orchids are Fertilised by Insects (1877)

Published by John Murray in 1862 (first edition) and 1877 (second edition). The first and second editions contain similar references, this, for example, is from pp. 352-3 of the first edition,

> Some naturalists believe that numberless structures have been created for the sake of mere variety and beauty,—much as a workman would make a set of different patterns. I, for one, have often and often doubted whether this or that detail of structure could be of any service; yet, if of no good, these structures could not have been modelled by the natural preservation of useful variations; such details could only be vagely accounted for by the direct action of the conditions of life, or the mysterious laws of correlation of growth.
>
> To give nearly all the instances of trifling details of structure in the flowers of Orchids, which are certainly of high importance, would be to recapitulate a great portion of this volume. But I will recall to the reader's memory a few cases. I do not here refer to the fundamental framework of the plant, such as the remnants of the fifteen primary organs [353] arranged alternately in the five worls; for nearly all those who believe in the modification of organic beings will admit that their presence is due to inheritance from a remote parent-form. A series of facts with respect to the use of the variously shaped and placed petals and sepals has just been enumerated. So, again, the importance of the slight differences in the shape of the caudicle of the pollinium of the Bee Ophrys, compared with that of the other species of the genus, has just been referred to: to this might be added the doubly-bent caudicle of the Fly Ophrys: indeed, the important relation of the length and shape of the caudicle, with reference to the position of the stigma, might be cited throughout whole tribes.[185]

[182] *ibid*., p. 329.
[183] *ibid*., p. 338.
[184] *ibid*., p. 364.
[185] Darwin, *On the Various Contrivances by Which British and Foreign Orchids Are Fertilised by Insects, and on the Good Effects of Intercrossing* (1862), pp. 352-53.

Flowers and their Unbidden Guests (1878)

Two mentions of the word 'beauty' where Darwin pointed out that understanding the structure of flowers does not lessen their beauty.

Erasmus Darwin (1879)

There are seven occurrences of the word 'beauty', three concerned with the poem 'Universal Beauty' by Henry Brooke, which Darwin dismissed as 'merely devoted to a representation of the glories of creation of the same character as the physico-theologies of that period'.[186] The other interesting reference is 'As regards smiling and the expression of the agreeable sensations, the author refers them, as well as the feeling of the beauty of undulating lines and of rounded surfaces, to the pleasure of the first nourishment derived from the soft and gently rounded maternal breast'.[187] Darwin appears to be relating beauty to a universal attribute 'of undulating lines and of rounded surfaces'.

The Formation of Vegetable Mould, Through the Action of Worms (1881)

In the last paragraph of his last great book he used the word 'beauty' to describe the landscape created by worms and this seems to summarize Darwin's work uncovering the hidden forces at work behind the complexity of life.

> When we behold a wide, turf-covered expanse, we should remember that its smoothness, on which so much of its beauty depends, is mainly due to all the inequalities having been slowly levelled by worms. It is a marvellous reflection that the whole of the superficial mould over any such expanse has passed, and will again pass, every few years through the bodies of worms. The plough is one of the most ancient and most valuable of mans inventions; but long before he existed the land was in fact regularly ploughed, and still continues to be thus ploughed by earth-worms. It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organised creatures. Some other animals, however, still more lowly organised, namely corals, have done far more conspicuous work in having constructed innumerable reefs and islands in the great oceans; but these are almost confined to the tropical zones.[188]

The Autobiography of Charles Darwin 1809-1882

Darwin's autobiography was a private document written for his family but it was published in 1958 by Collins, London. In it, Darwin pointed out that when young he visited art galleries and found his taste was confirmed by experts and he read Reynolds's *Discourses.*

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[186] Charles Darwin, *Erasmus Darwin* (London: John Murray, 1879), p. 188.
[187] *ibid*., p. 167.
[188] Darwin, *The Formation of Vegetable Mould, through the Action of Worms*, 1st edn (1881), p. 313.

> But I am glad to think that I had many other friends of a widely different nature. I was very intimate with Whitley, who was afterwards Senior Wrangler, and we used continually to take long walks together. He inoculated me with a taste for pictures and good engravings, of which I bought some. I frequently went to the Fitzwilliam Gallery, and my taste must have been fairly good, for I certainly admired the best pictures, which I discussed with the old curator. I read also with much interest Sir J. Reynolds' book. This taste, though not natural to me, lasted for several years and many of the pictures in the National Gallery in London gave me much pleasure; that of Sebastian del Piombo exciting in me a sense of sublimity.[189] (p. 61)
>
> I have said that in one respect my mind has changed during the last twenty or thirty years. Up to the age of thirty, or beyond it, poetry of many kinds, such as the works of Milton, Gray, Byron, Wordsworth, Coleridge, and Shelley, gave me great pleasure, and even as a schoolboy I took intense delight in Shakespeare, especially in the historical plays. I have also said that formerly pictures gave me considerable, and music very great delight. But now for many years I cannot endure to read a line of poetry: I have tried lately to read Shakespeare, and found it so intolerably dull that it nauseated me. I have also almost lost any taste for pictures or music.—Music generally sets me thinking too energetically on what I have been at work on, instead of giving me pleasure. I retain some taste for fine scenery, but it does not cause me the exquisite delight which it formerly did. On the other hand, novels which are works of the imagination, though not of a very high order, have been for years a wonderful relief and pleasure to me, and I often bless all novelists. A surprising number have been read aloud to me, and I like all if moderately good, and if they do not end unhappily—against which a law ought to be passed. A novel, according to my taste, does not come into the first class unless it contains [139] some person whom one can thoroughly love, and if it be a pretty woman all the better.
>
> This curious and lamentable loss of the higher aesthetic tastes is all the odder, as books on history, biographies and travels (independently of any scientific facts which they may contain), and essays on all sorts of subjects interest me as much as ever they did. My mind seems to have become a kind of machine for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone, on which the higher tastes depend, I cannot conceive. A man with a mind more highly organised or better constituted than mine, would not I suppose have thus suffered; and if I had to live my life again I would have made a rule to read some poetry and listen to some music at least once every week; for perhaps the parts of my brain now atrophied could thus have been kept active through use. The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature.[190]

The Life and Letters of Charles Darwin (1887)

The Life and Letters of Charles Darwin, Including an Autobiographical Chapter (London: John Murray, 1887) is by Francis Darwin and published in three volumes. In the first volume there are ten occurrences of ‘beauty’ but all of them used descriptively including a touching description of Darwin’s tender love of the beauty of flowers, ‘I used to like to hear him admire the beauty of a flower; it was a kind of gratitude to the flower itself, and a personal love for its delicate form and colour. I seem to remember him gently touching a flower he delighted in; it was the same simple admiration that a child might have. ¶ He could not help personifying natural things’.[191]

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[189] Darwin, *The Autobiography of Charles Darwin* (1887), p. 61.
[190] *ibid*., pp. 138-39.
[191] *The Life and Letters of Charles Darwin*, ed. by Darwin, I, p. 117.

In Volume 2, there is only one occurrence, which used the word descriptively.

Volume 3 contains the letter to Lyell listed below as Letter 4752 with four occurrences of ‘beauty’. Four further occurrences in the volume use the word ‘beauty’ descriptively.

Francis Darwin includes a note concerning an incident described by Mr. Romanes, which is worth quoting in full:

> "I have always remembered the following little incident as a good example of Mr. Darwin's extreme solicitude on the score of accuracy. One evening at Down there was a general conversation upon the difficulty of explaining the evolution of some of the distinctively human emotions, especially those appertaining to the recognition of beauty in natural scenery. I suggested a view of my own upon the subject, which, depending upon the principle of association, required the supposition that a long line of ancestors should have inhabited regions, the scenery of which is now regarded as beautiful. Just as I was about to observe that the chief difficulty attaching to my hypothesis arose from feelings of the sublime (seeing that these are associated with awe, and might therefore be expected not to be agreeable), Mr. Darwin anticipated the remark, by asking how the hypothesis was to meet the case of these feelings. In the conversation which followed, he said the occasion in his own life, when he was most affected by the emotions of the sublime was when he stood upon one of the summits of the Cordillera, and surveyed the magnificent prospect all around. It seemed, as he quaintly observed, as if his nerves had become fiddle-strings, and had all taken to rapidly vibrating. This remark was only made incidentally, and the conversation passed into some other branch. About an hour afterwards Mr. Darwin retired to rest, while I sat up in the smoking-room with one of his sons. We continued smoking and talking for several hours, when at about one o'clock in the morning the door gently opened and Mr. Darwin appeared, in his slippers and [55] dressing-gown. As nearly as I can remember, the following are the words he used:—
>
> "'Since I went to bed I have been thinking over our conversation in the drawing-room, and it has just occurred to me that I was wrong in telling you I felt most of the sublime when on the top of the Cordillera; I am quite sure that I felt it even more when in the forests of Brazil. I thought it best to come and tell you this at once in case I should be putting you wrong. I am sure now that I felt most sublime in the forests.'
>
> "This was all he had come to say, and it was evident that he had come to do so, because he thought that the fact of his feeling 'most sublime in forests' was more in accordance with the hypothesis which we had been discussing, than the fact which he had previously stated. Now, as no one knew better than Mr. Darwin the difference between a speculation and a fact, I thought this little exhibition of scientific conscientiousness very noteworthy, where the only question concerned was of so highly speculative a character. I should not have been so much impressed if he had thought that by his temporary failure of memory he had put me on a wrong scent in any matter of fact, although even in such a case he is the only man I ever knew who would care to get out of bed at such a time of night in order to make the correction immediately, instead of waiting till next morning. But as the correction only had reference to a flimsy hypothesis, I certainly was very much impressed by this display of character." [192]

In a letter to Lyell of 1 June 1867, Darwin wrote regarding George Campbell, ‘Still odder, it seems to me, all that he says on beauty, which I should have thought a

[192] *ibid*., pp. 54-55.

nonentity, except in the mind of some sentient being. He might have as well said that love existed during the secondary or Palæozoic periods'.[193]

He also included Letter 4510, shown below, that states that beauty differs widely between different races.

In a letter to Wallace of 26 February 1867, he wrote: 'With respect to the beauty of male butterflies, I must as yet think that it is due to sexual selection'.[194] Again in a letter to Wallace (23 September, year unknown) he wrote: 'I value the cases of bright-coloured, incubating male fishes, and brilliant female butterflies, solely as showing that one sex may be made brilliant without any necessary transference of beauty to the other sex; for in these cases I cannot suppose that beauty in the other sex was checked by selection'.[195]

In a letter to August Weismann he wrote: 'I may have erred on many points, and extended the doctrine too far, but I feel a strong conviction that sexual selection will hereafter be admitted to be a powerful agency. I cannot agree with what you say about the taste for beauty in animals not easily varying'.[196]

In a letter to the Marquis de Saporta of 24 December 1877 he wrote: 'I formerly showed that we might fairly assume that the beauty of flowers, their sweet odour and copious nectar, may be attributed to the existence of flower-haunting insects, but your idea, which I hope you will publish, goes much further and is much more important'.[197]

More Letters of Charles Darwin (1903)

Francis Darwin and A. C. Seward published *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters* in 1903 as two volumes. Volume 1 has thirteen occurrences of the word 'beauty' but they are either descriptive or the letters are included in the Darwin Correspondence Project below.

In Volume 2, there is one letter not in the Darwin Correspondence Project, a letter 30 April 1868 to Wallace. Darwin wrote:

> I am not shaken about the female protected butterflies. I will grant (only for argument) that the life of the male is of very little value,—I will grant that the males do not vary, yet why has not the protective beauty of the female been transferred by inheritance to the male? The beauty would be a gain to the male, as far as we can see, as a protection; and I cannot believe that it would be

[193] *ibid*., p. 65.
[194] *ibid*., p. 94.
[195] *ibid*., p. 126.
[196] *ibid*., p. 157.
[197] *ibid*., p. 285.

> repulsive to the female as she became beautiful. But we shall never convince each other. I sometimes marvel how truth progresses, so difficult is it for one man to convince another, unless his mind is vacant. Nevertheless, I myself to a certain extent contradict my own remark, for I believe far more in the importance of protection than I did before reading your articles.
>
> [...] That is an excellent remark of yours about no known case of male alone assuming protective colours; but in the cases in which protection has been gained by dull colours, I presume that sexual selection would interfere with the male losing his beauty. If the male alone had acquired beauty as a protection, it would be most readily overlooked, as males are so often more beautiful than their females.[198]

Another letter not in the Darwin Correspondence Project is Darwin's reply to Tate dated 12 March 1869, he wrote:

> I have received your two letters of March 2nd and 5th, and I really do not know how to thank you enough for your extraordinary kindness and energy.
>
> [...] In regard to beauty, I do not feel the difficulty which you and some others experience. In the last edition of my Origin I have discussed the question, but necessarily very briefly. A new and I hope amended edition of the Origin is now passing through the press, and will be published in a month or two, and it will give me great pleasure to send you a copy.[199]

Letters from the Darwin Correspondence Project

The following correspondence is from the Darwin Correspondence Project and the letter numbers are theirs. Their online search lists one hundred and thirty two letters that match the word 'beauty' exactly. Matches with 'beautiful' were found but the word was used descriptively. Letters that use the word 'beauty' descriptively or add little to the debate on beauty have been removed. For most of the letters a summary or short extract is quoted that gives an idea of the context of the use of the word 'beauty'. The summaries and footnotes are taken from the Darwin Correspondence Project and are shown in quotes. Footnotes are only included and shown in square brackets if they provided additional information regarding Darwin's theory of beauty. In each case, the person the letter is from is listed first and so the quoted text is written by that person.

Letter 399 — Darwin, C. R. to Wynne, [Feb–July 1838]

Darwin asks about the 'Idea of beauty in animals: do females prefer certain males? or vice versa.' This indicates he was considering sexual selection four years before his brief pencil sketch of a theory of 'descent with modification' in 1842. His theory of sexual selection was not fully developed and published until *Descent of Man* in 1871 but this letter and his notebooks indicate that sexual selection and beauty were fundamental constituents of his thinking about evolution from the beginning.

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[198] *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters*, ed. by Darwin and Seward, pp. 76-77.

[199] *ibid*., p. 382.

Letter 6520 — Darwin, C. R. to Mantell, W. B. D., [before 10 Apr 1856]

Darwin ‘asks whether New Zealand tribes have an idea of beauty in women which is "like ours"; Mantell answers, "Yes".’

Letter 1850 — Andersson, C. J. to Darwin, C. R., [6 Apr 1856]

> … with regard to the beau ideal satisfactorily; for amongst us Europeans it is well known that one man selects his partner for a handsome face, whilst another make his choice of a good figure without much regard to beauty. All I can say is that savages generally select their partners more for any attraction the body may posses than for beauty of face.

Andersson was a Swedish-born explorer of Africa. Darwin also asked Walter Baldock Durrant Mantell (1820-1895) the same question about sexual selection among indigenous populations (see letter to W. B. D. Mantell, 10 April [1856]). Neither Mantell nor Andersson was cited in *Descent*.

Letter 1663 — Darwin, C. R. to Mantell, W. B. D., 10 Apr [1856]

Darwin wrote: ‘Finally, do the uncivilised natives have the same ideal of [human] beauty as Europeans? Lastly, I fear you cannot answer my question whether the beau ideal of beauty amongst the less civilised natives (ie those least influenced by being accustomed to European faces) would agree with ours; viz whether we & they would pick out the same kind of beauty.’

Letter 2581 — Darwin, C. R. to Galton, Francis, 13 Dec [1859]

Darwin wrote: ‘Thank you for the other notes: till I compare all my notes, I feel very doubtful about the share males & females play in sexual selection; I suspect that the male will pair with any female, & that the females select the victorious or most beautiful cock, or him with beauty & courage combined.’

Galton's notes may have been in the part of the letter from Francis Galton, 9 December 1859 that is now missing.

Letter 2640 — Darwin, C. R. to Bridges, Thomas (b), 6 Jan 1860

Darwin wrote: ‘What ideas of feminine beauty have the Fuegians? do they admire women with strong American cast of countenance, or such as at all approach Europeans in appearance?’

Letter 2697 — Thwaites, G. H. K. to Darwin, C. R., [14 Feb 1860]

> It is not easy to understand how, with a similar capability of modification in all, some cells should remain in their originally simple condition whilst others should, within the same period, have become modified by mere natural selection into the most highly organized & complicated structures.

Thwaites asked Darwin how ‘mere natural selection’ can give rise to ‘such exquisite beauty & symmetry as we see in every organized structure?’

Letter 2731 — Darwin, C. R. to Thwaites, G. H. K., 21 Mar [1860]

> I have also a M.S. discussion on beauty—but do you really suppose that for instance Diatomaceæ were created beautiful that man after millions of generations shd. admire them through the microscope?[200] I should attribute most of such structures to quite unknown laws of growth; and mere repetition of parts is to our eyes one main element of beauty. When any structure is of use (and I can show what curiously minute particulars are often of highest use), I can see with my prejudiced eyes no limit to the perfection of the coadaptations which could be effected by Natural Selection.[201]

Darwin here made an important point about beauty, that ‘mere repetition of parts’ is a main element. His central theory explains the beauty of sexual partners through selection and inheritance and the beauty of flowers partly because of our common ancestry with insects and partly because of our love of bright colours. The beauty we find in landscape he regarded as a complex cultural phenomenon although later writers speculate it may be because of an inherited attraction towards landscapes that were beneficial to hunter-gatherer ancestors.

Letter 3118 — Darwin, C. R. to Tegetmeier, W. B., 14 Apr [1861]

> There can hardly be a doubt that the beauty of male Bird is to charm the female. Now it has occurred to me to ask you to observe, whether Hens yield to your Hen-tailed Game, as readily as to other cocks. He would be victor, & so have enormous advantage, but would his want of beauty at all interfere with his amatory success, supposing any other & gorgeous cock were present.— I formerly thought of clipping and mutilating the feathers of a cock & observing, but I could not spare time to observe.

Letter 3166 — Tegetmeier, W. B. to Darwin, C. R., [28 May 1861]

This and the next letter from B. P. Brent provided contrary evidence to Darwin’s theory of sexual selection and he dismissed them because the environment was artificial.

> I believe that as a general rule a hen when with egg will yield to any cock I do not think she refuses (as with pigeons) when she requires impregnating

Letter 3167 — Brent, B. P. to Darwin, C. R., 29 May 1861

> I do not think the hen cares for the beauty, of the cock she may for his attentions, beauty may assist as a charm, perhaps may assist in exciting her feelings but I do not think they ever think about it or make any choice other than to satisfy their desire by the first offer. the only fact of choice I can call to mind is that an old hen will sometimes run away from a young officious bird and seek the protection of the old cock, just to escape the annoyances of the juvenile.

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[200] Thwaites was an expert on the Diatomaceae, what we now call diatoms, one of the most common forms of phytoplankton. Phytoplankton account for half of all photosynthesis on Earth.

[201] Letter from Darwin to Thwaites, 'Short How Can Natural Selection Produce Beauty?', 21 March [1860]

Letter 3426 — Kingsley, Charles to Darwin, C. R., 31 Jan 1862

Charles Kingsley defended Darwin's theory at a shooting party with the Bishop of Oxford and the Duke of Argyll. Kingsley then puts forward an early 'scientific' theory concerning elves and fairies that was based on them being an as yet undiscovered race of small people that lived before modern man. Kinglsey proposed, 'proposed that mythological races, e.g., elves and dwarfs, were intermediate species between man and apes, and have become extinct by natural selection. The Elves Fairies & Dwarfs puzzle me, the 2 first being represented, originally, as of great beauty, the Elves dark, & the Fairies fair; & the Dwarfs as cunning magicians, & workers in metal— They may be really conquered aborigines.'

Letter 3430 — Hooker, J. D. to Darwin, C. R., [31 Jan – 8 Feb 1862]

Wrote a "frightful screed" about aristocracy's being a necessary consequence of natural selection, and then burnt it. H. W. Bates is the only man "thinking out" natural selection to any purpose. "I think I have driven Bates back to Nat. Sel. as the only way of solving his difficulties." HWB's mimetic butterflies. JDH wishes he had time to do the same thing with plants. Owen and Huxley involved in a "contemptible" squabble in the Edinburgh…

The following three letters concern beauty and the aristocracy, an early discussion of social Darwinism.

Letter 3480 — Hooker, J. D. to Darwin, C. R., [23 Mar 1862]

Hooker puts forward some light-hearted thoughts on "the development of an Aristocracy" after a visit to Walcot Hall, Shropshire. Hooker does not see why this is not "itself a variation, not necessarily induced by domestication, but accompanying some variety artificially selected".

Letter 4224 — Hooker, J. D. to Darwin, C. R., [29] June 1863

The letter presents Hooker's social dogma, "Brains x Beauty = Breeding + wealth".

Letter 4510 — Darwin, C. R. to Wallace, A. R., 28 [May 1864]

With respect to the differences of race, a conjecture has occurred to me that much may be due to the correlation of complexion (& consequently Hair) with constitution. Assume that a dusky individual best escaped miasma & you will readily see what I mean: I persuaded the Director Gen. of the Med. depart. of the army to send printed forms to the surgeons of all Regiments in Tropical countries to ascertain this point, but I dare say I shall never get any returns. Secondly I suspect that a sort of sexual selection has been the most powerful means of changing the races of man. I can shew that the difft races have a widely difft standard of beauty. Among savages the most powerful men will have the pick of the women & they will generally leave the most descendants.[f18] [...] Our aristocracy is handsomer (more hideous according to a Chinese or Negro) than middle classes from [having the] pick of women; but oh what a scheme is primogeniture for destroying N. Selection."—[f20].

[f18]. Darwin discussed sexual selection in Origin, pp. 87-90 and 156-7, but not in relation to humans; see also Correspondence vol. 9, letter to H. W. Bates, 4 April [1861]. Some of Darwin's early notes, made from 1838 to 1840, touched on differing ideals of beauty in humans and on mate selection (see Notebooks, Notebook D, 99; Notebook M, 32; Notebook N, 26-9; and `Old and useless notes', 8, 14, 22-4; see also Barrett 1980). Darwin later made queries regarding the sense of beauty in different races (see Correspondence vol. 6, letter from C. J. Andersson, [6 April 1856], letter to W. B. D. Mantell, 10 April [1856] and n. 5, and Correspondence vol. 8, letter to Thomas Bridges, 6 January 1860). The second part of Descent was devoted to sexual selection in animals, including humans; in Descent 1: 249-50 and 2: 316-84 and 396-402, Darwin discussed sexual

selection in humans. For Darwin's application of sexual selection to human racial change, see Descent 1: 249-50 and 2: 368-71. See also Durant 1985, pp. 297-301.

[f20] For Darwin's earlier comments on inheritance by the first-born, and on the English aristocracy, see Correspondence vol. 3, letter to J. S. Henslow, 25 July 1845, and Correspondence vol. 10, letter to J. D. Hooker, 25 [and 26] January [1862]. See also Descent 1: 170. For Darwin on notions of beauty in different races, see n. 18, above. On Victorian ideals of beauty, see Cowling 1989.

Letter 4514 — Wallace, A. R. to Darwin, C. R., 29 May [1864]

Wallace gave Darwin complete credit for the theory of natural selection but was concerned that 'warfare and sex' are very uncertain means of selection, he added:

> The sexual selection you allude to will also I think have been equally uncertain in its results—In the very lowest tribes there is rarely much polygamy & women are more or less a matter of purchase— There is also little difference of social condition & I think it rarely happens that any healthy & un-deformed man remains without wife & children. I very much doubt the often-repeated assertion that our aristocracy are more beautiful than the middle classes are. I allow that they present specimens of the highest kind of beauty, but I doubt the average. I have noticed in country places a greater average amount of good looks among the middle classes, & besides we unavoidably combine in our idea of beauty, intellectual expression & refinement of manners, which often make the less appear the more beautiful. Mere physical beauty,—that is, a healthy & regular development of the body & features approaching to the mean or type of European man,—I believe is quite as frequent in one class of society as the other & much more frequent in rural districts than in cities.

Letter 4746 — Lyell, Charles to Darwin, C. R., 16 Jan 1865

> He [Duke of Argyll] ought also to define beauty, and tell us whether it is in reference to man or bird. I have no objection to the idea of beauty or variety for its own sake, but to assume it so positively is philosophical.

Letter 4752 — Darwin, C. R. to Lyell, Charles, 22 Jan [1865]

> The Duke who knows my orchis book so well might have learnt a lesson of caution from it, with respect to his doctrine of differences for mere variety or beauty.[f8] It may be confidently said that no tribe of plants presents such grotesque & beautiful differences which no one until lately conjectured were of any use; but now in almost every case, I have been able to shew their important service.
>
> It should be remembered that with humming birds or orchids a modification in one part will cause correlated changes in other parts.[f9] I agree with what you say about beauty. I formerly thought a good deal on the subject & was led quite to repudiate the doctrine of beauty being created for beauty's sake.[f10]"

[f8] Against the view that natural structures were created for the sake of beauty or variety, Darwin argued in Orchids, pp. 346-60, that the unusual or beautiful forms of the orchid flowers facilitated pollination by insects. Campbell had reviewed Orchids in the October 1862 issue of the Edinburgh Review ([G. D. Campbell] 1862).

[f9] Darwin discussed the principle of correlation of growth in Origin, pp. 11-12 and 143-50. According to this principle, when slight variations occur in one part of an organism, and are accumulated through natural selection, other parts of the organism are modified.

[f10] In Origin, p. 199, Darwin briefly discussed the question of beauty in relation to selection, stating: `[some naturalists] believe that very many structures have been created for beauty in the eyes of man, or for mere variety. This doctrine, if true, would be absolutely fatal to my theory.' The discussion of beauty is expanded in Origin 4th ed., pp. 238-41. Darwin began to make notes on

differing ideals of beauty in humans and on mate selection between 1838 and 1840 (see Notebooks, Notebook D, 99; Notebook M, 32; Notebook N, 26-9; and Old and useless notes, 8, 14, 22-4; see also Barrett 1980). See also Correspondence vol. 8, letter to G. H. K. Thwaites, 21 March [1860], and Correspondence vol. 12, letter to A. R. Wallace, 28 [May 1864] and n. 18.

Letter 4939 — Shaw, James to Darwin, C. R., 20 Nov 1865

Some strictures were lately passed on your hypothesis by the Duke of Argyll.[f7] I endeavoured to point out where his Lordship was at fault. Of some of my objections to his criticism he took notice but to other of my objections he was silent. Out of that communication there is only one suggestion which I think is worth transmitting to you, but if the smallest scintillation of mine is acceptable for the light which you have shed on me you are welcome.

His Lordship (vide Good Words 1865) is puzzled to understand why there is so much beauty in the world—beauty in the shell—beauty in the flower—exquisite beauty, wonderful patterns of colour, in the plumes of humming birds. Then he proceeds to account for it not on your hypothesis but on the hypothesis that beauty affords a direct pleasure to its creator, remarking that your hypothesis is not yet wide enough to treat this subject. Now I have no objection to the Creator being delighted with beauty and making it to please himself, but not being taken in to his confidence at the creation of it, I cannot give an opinion on the subject.

But to return to observation. Does his Grace deny all sense or love of beauty in the brutes? (To this query he returns no answer) Comte says the religion of brutes is the reverence gratitude and obedience which they display towards their masters. If dogs be credited with religion why should birds be denied all aesthetical faculty? Birds like benighted Africans are fond of glittering pieces. Witness how larks in France are caught by twirling for them. The gorgeous Birds of Paradise are extremely attentive to their plumage and exceedingly sensitive concerning its cleaness &c &c His Grace points to the savage as an example of the width of range of the love of ornament, and Carlyle suggests that rather than the desire of comfort the love of ornament was the first step towards clothes. Strange if a passion diffused throughout all humanity should have no counterpart in other regions of life. Beauty like song is developed in the male chiefly at the breeding season. If the female give preference to the male of gaudiest hue or richest plumage it will be a chance for the preservation of such. The question propounded concerning the beautiful in Nature is I grant wider than this answer—but I think this answer ought not to be forgot in favour of your hypothesis.

[f7] In his article `The reign of law' in the religious weekly Good Words, George Douglas Campbell, eighth duke of Argyll, had criticised Darwin's theory of natural selection for failing to explain adequately the beauty and variety in nature (G. D. Campbell 1865, p. 231): The evidence is indeed abundant, that ornament and variety are provided for in nature for themselves and by themselves, separate from all other use whatever. Any theory on the origin of species which is too narrow to hold this fact, must be taken back for enlargement and repair. Campbell had made the same criticism in his address to the Royal Society of Edinburgh on 5 December 1864 (G. D. Campbell 1864). For a discussion of Campbell's address and Darwin's response, see the letter from Charles Lyell, 16 January 1865 and nn. 6-11, and the letter to Charles Lyell, 22 January [1865] and nn. 5-14.

Letter 4943 — Darwin, C. R. to Shaw, James, 30 Nov 1865

I have reflected much on the question of beauty.[f3] It is a very complicated one. I quite agree with what you say on the beauty of birds, and the same view may be extended to butterflies and some other beings.[f4] I think I can show that the beauty of flowers and of many kinds of fruit is solely to attract, in the former case, insects for their intercrossing, and in the latter case, to attract birds for the dissemination of the seed.”

[f3] For Darwin's early interest in the subject of beauty in relation to natural selection, see the letter to Charles Lyell, 22 January [1865] and n. 10.

[f4] In Origin, pp. 88-90 and 199, Darwin suggested that many beautiful characteristics, such as the ornamental plumage of birds, could arise through sexual selection. Darwin expanded his discussion of beauty in Origin 4th ed., pp. 238-41. On the subject of beauty in birds, see also the letter from Charles Lyell, 16 January 1865, n. 11, and Descent 2: 108-24. On the operation of sexual selection in butterflies, moths, and other insects, see Descent 1: 386-423.

Letter 5003f — Shaw, James to Darwin, C. R., 6-10 Feb 1866 [f1]

This letter is worth quoting in full as it solely concerns the appreciation of beauty.

To Dr Darwin | with Mr Shaw's Compls

The Appreciation of Beauty by Animals.

At a meeting of the Natural History & Antiquarian Society held in Dumfries on Tuesday 6th. Feb. 1866 Mr Shaw of Tynron read a paper on the above topic. Sir Wm. Jardine Bart of Applegirth in the Chair.[f2]

Mr Shaw remarked the subject of beauty in animal and vegetable had, in an Essay by the Duke of Argyll, been called a theological one, not a natural-history one, and that his Grace had thrown it by way of a stumbling block in front of Dr Darwin's theory.[f3] The writer had reason to believe that Dr Darwin was not likely to fall over this stumbling block but that he saw his way to at least a partial solution of the problem.

Mr Shaw then attempted to prove that in man from the most civilized to the most barbarous, from the infant to the man of grey hairs, tribute was paid to external loveliness, and that passion was so remarkable in the savage that a great modern thinker had suggested that ornament not comfort was at the origin of clothes.[f4] At considerable length he adduced striking instances of taste, love of cleanliness, pleasure in personal decoration, courtesy towards their own image in mirror or picture, pride and ostentation, in some of the most lively and loving birds.

He then showed that in certain cases some birds, as the Australian Bower Bird, the Magpie, the Cornish chough, the Raven, the Daw &c went beyond themselves and out of their own species in their appreciation of beauty and their attempts to conserve it—their tastes being, as was to be expected, more similar to those of savages and apes & children in the objects of their selection than to those of civilized men.[f5]

Having quoted Mr Montagu's observations concerning the manner in which singing birds attract towards them the females at the mating season by means of song, he repelled that naturalist's conclusion that the ear alone guided the female to its choice, since Nature at the pairing season was at as much pains to please the eye as to delight the ear.[f6] He then asked if it was merely a coincidence or was it that beauty was attractive to the beautiful that humming-birds & butterflies were so often found hovering over flowers the rivals of themselves in gorgeousness.

Mr. Darwin thought these flowers might be decoys, by which their seed-sower was drawn to its task.[f7]

Allusion was made to the intoxicating effect of light on insects, so like its effects on human babies and to the fact that it was among insects that the fire-flies are found. The fire-flies were attracted into the dwellings in St. Domingo by torches for the purpose of killing mosquitoes, and what more likely than that their own torches should be elements of sexual attraction & an animal having a little more gayety, a little more light, in its organization than its companions of the same species would thus draw more readily towards it a partner and by its beauty secure further perpetuity and extension of the charm. More than one observer has connected this living light with the attractions of sex.

The writer then remarked on the wonderful similarity of the construction of the eye and on the fact that although beauty in animal & vegetable was wide-spread—so in the kingdoms of animated nature was the seeing faculty, and doubtless other eyes, as well as human had preferences in the things that they saw.[f8]

A conversation ensued.

Dr. Dickson[f9] thought that this paper went to undermine Dr. Darwin's theory, as it exalted feebleness into a favoured condition by allowing beauty to be an element in the preservation of races or of individuals.

Dr. Grierson[f10] thought that beauty and health went together—the beauty of a peach-cheek depended on the health of its possessor.

Mr. Shaw thought that Dr. Dickson misconceived Dr. Darwin's views if he was under the impression that they accounted only for the existence of the strongest. Take the illustration of the wolves, where adaptation, not strength was the favouring circumstance.[f11]

The Chairman, Sir Wm. Jardine, said that more facts ought to be collected before forming such high conclusions.

In reply to a question Mr. Shaw said that it seemed to him that nature had placed its spangles and glowing colours just where they were most readily seen. Birds and some other beasts had got their crowns and their coronets, their breast-knots & shoulder-knots their trains and painted eyes and ornamented cheeks and ears like Kings and Queens. In cases where the animal ornaments were not patent at once powerful muscles were provided for erection and display.[f12]

Footnotes

[f1] The date range is established by the date on which Shaw read his paper (see n. 2, below) and by Darwin's reply to Shaw of 11 February [1866].

[f2] The text, which is handwritten, is that of a newspaper report of the paper Shaw read to the Dumfriesshire and Galloway Natural History and Antiquarian Society on 6 February 1866; the newspaper in which it was published has not been identified. A fuller account of Shaw's paper later appeared in the Transactions and Journal of the Proceedings of the Dumfriesshire and Galloway Natural History and Antiquarian Society for the session 1864-5.

[f3] Shaw's paper referred to `The reign of law', by George Douglas Campbell, eighth duke of Argyll (G. D. Campbell 1865, pp. 229-31). Campbell accepted that the development of natural processes could be accounted for by Darwin's transmutation theory but maintained that their origination was under divine control; he also challenged Darwin's belief in the functional origin of beauty as expressed in, for example, Orchids, pp. 351-2 (G. D. Campbell 1862, pp. 394-5). For further discussion on the natural or divine origins of beauty, see Correspondence vol. 13, letter to Charles Lyell, 22 January [1865], and letter from James Shaw, 20 November 1865 and n. 7. For a commentary on the tensions between religion and science in Darwin's philosophy of nature, see Sloan 2001; for a Christian perspective on beauty as a product of the evolutionary process, see, for example, Haught 2000, pp. 126-37.

[f4] Shaw refers to Thomas Carlyle and to Sartor Resartus ([Carlyle] 1838). See also R. Wallace ed. 1899, p. lviii, and Correspondence vol. 13, letter from James Shaw, 20 November 1865.

[f5] In the full published version (Shaw 1866a, see n. 2 above), Shaw suggested that an interest in shiny objects was common to Africans, children, and many other human groups.

[f6] The writer refers to a passage on birdsong in Montagu 1831, pp. 475-80; George Montagu wrote that male songbirds did not in general search for females but attracted them by song (ibid., p. 475). Montagu was later cited on this point by Darwin (Descent 2: 52 and n.). Montagu also wrote, `we cannot suppose birds discriminate the colours … because some distinct species are so exactly alike that a mixture might take place' (Montagu 1831, p. 475).

[f7] In Shaw 1866a, the flower of the bee orchis (or ophrys) is cited as Darwin's example of a decoy. However, the bee ophrys, Ophrys apifera, is frequently self-pollinated and rarely attracts insects (Orchids, pp. 63-72). Shaw was apparently mistaken in citing this example, although Darwin gave examples of various mechanisms by which many other species of orchid lured pollinators to their flowers (Orchids, pp. 346-60 and passim).

[f8] Darwin discussed the development of the eye by natural selection in Origin, pp. 186-90.

[f9] John Dickson was a co-founder and secretary of the Dumfriesshire and Galloway Natural History and Antiquarian Society (Gladstone 1913, pp. 9-10, 34).

[f10] Thomas Boyle Grierson was a co-founder and vice-president of the Dumfriesshire and Galloway Natural History and Antiquarian Society (Gladstone 1913, p. 10).

[f11] Shaw's reference was to Origin, pp. 90-1, where Darwin used the example of wolves to argue that different environments would lead to the selection of different adaptations and ultimately to the emergence of distinct varieties.

[f12] Shaw's point about beauty in animals being prominently positioned, such as on the head, is developed further in Shaw 1866b. See also Descent 2: 71 and n.

Letter 5004 — Darwin, C. R. to Shaw, James, 11 Feb [1866]

Darwin's reply to the previous letter from James Shaw.

> I am much obliged to you for your kindness in sending me an abstract of your paper on beauty. In my opinion you take quite a correct view of the subject. It is clear that Dr. Dickson has either never seen my book, or overlooked the discussion on sexual selection. If you have any precise facts on birds' `courtesy towards their own image in mirror or picture' I should very much like to hear them. Butterflies offer an excellent instance of beauty being displayed in conspicuous parts; for those kinds which habitually display the underside of the wing have this side gaudily coloured, and this is not so in the reverse case.

Letter 5005 — Shaw, James to Darwin, C. R., 14 Feb 1866

The letter reported instances of two birds and a cat admiring their images in mirrors or on pictures. This was provided as evidence of the self-awareness of beauty in non-human animals.

Letter 5060 — Shaw, James to Darwin, C. R., 19 Apr 1866

James Shaw provided more examples of birds admiring themselves in mirrors.

Letter 5006 — Darwin, C. R. to Shaw, James, [23 Apr 1866]

Darwin mentioned his new discussion of beauty in the fourth edition of *Origin*, pp. 237-41. He briefly discussed cases in which birds looked at themselves in a mirror in *Descent* 2: 111.

Letter 5270 — Shaw, James to Darwin, C. R., 7 Nov 1866

> The difference between the tastes of cultivated man & that of savages & birds is not so great when we expand your remark on the modern feeling for scenery &c by tracing how gradually it has arisen.[f2]
>
> (Cosmos vol II.)[f3] The Sublime & Beautiful of the heroic ages were accessory to Power & Love. De Quincy somewhere remarks that Shakespeare was the first English poet who has alluded to clouds per se & that in terms far removed from Shelley's rapturous poem.[f4]
>
> What we call ugliness may sometimes be for an animals' good as is its stench, repulsive to its enemies as perfume is attractive to its mate; witness the manner

of frightening birds by horrid painted screens, depriving them almost of sense for a little (practised in Palestine), & then shooting or catching them.

Keats's exquisite description of a venomous serpent:— ``She was a Gordian shape of dazzling hue, vermilion spotted, golden, green, & blue''[f5] &c shows that the idea of danger being eliminated as regards the describer something remains pleasing to the eye.

[f2] Shaw refers to Darwin's comment, `The idea also of beauty in natural scenery has arisen only within modern times' (Origin 4th ed., p. 239).

[f3] Shaw refers to volume 2 of Humboldt 1846-58 (Cosmos: sketch of a physical description of the universe); volume 2 has two sections, `Incitements to the study of nature' and `History of the physical contemplation of the universe'. Darwin read this volume in May 1848 (see Darwin's reading notebooks, Correspondence vol. 4, Appendix IV, 119: 21a; see also Correspondence vol. 4, letter to Edward Cresy, [May 1848]). There is a copy of it in the Darwin Library-Down.

[f4] Thomas De Quincey wrote in his essay `On Wordsworth's poetry' that cloud architecture had been little noticed by earlier poets, claiming that there was no distinct sketch of the appearance of clouds before William Shakespeare's Antony and Cleopatra (see Masson ed. 1889-90, 11: 317-18). Shaw refers to Percy Bysshe Shelley's poem `The cloud' (Shelley 1834, 2: 469-72).

[f5] The quotation is from John Keats's poem `Lamia' (Keats 1820, p. 6).

[f6] Darwin had added a new passage to the fourth edition of Origin criticising the view that organic beings had been created beautiful for the benefit of human beings (Origin 4th ed., pp. 238-41). In it he claimed (ibid., p. 240) that the beauty of fruits served `merely as a guide to birds and beasts', so that the fruit might be eaten and the seeds disseminated.

Letter 5284a — Darwin, C. R. to Shaw, James, 24 Nov [1866]

Darwin wrote to James Shaw saying he admired his article on beauty in the *Athenæum.* See `Feeling of beauty among the animals', 24 November 1866 issue of the *Athenæum* (Shaw 1866b). Darwin cited the article in *Descent* 2:71. Also see letters 11 February [1866] and [23 or 30 April 1866], and the letters from James Shaw, [6-10 February 1866], 14 February 1866, 19 April 1866, and 7 November 1866.

Letter 5968 — Wallace, A. R. to Darwin, C. R., 2 Mar [1867]

[…] I certainly cannot yet see my way to any action of sexual selection in forming the races of man.[f7] Stealing wives from other tribes for instance is a very common practice, & it would I imagine tend to check any selective action. Youth is almost the only thing a savage cares about, and the handsomest & finest women very often become prostitutes & leave few or no offspring. The women certainly don't choose the men, & the men want chiefly in a wife, a servant. Beauty is I believe a very small consideration with most savages, as it is very rare to find a woman so plain as not to leave as many or more offspring than the most beautiful.[f8] This of course is a delicate subject to go into.

My present impression is, that the distinctive characters of human races are almost wholly due to correlation with constitutional adaptations to climate soil food & other external conditions. You must have facts of which I am quite ignorant,—& at all events your essay will be most welcome & is sure to be valuable.[f9]'

[f7] See letter to A. R. Wallace, 26 February [1867] and n. 5. Wallace maintained this view when he expanded his earlier essay on the origin of human races (A. R. Wallace 1864b) in A. R. Wallace 1870, pp. 303-31. For Darwin's and Wallace's differing views of the importance of sexual selection in the origin of the human races, see Kottler 1985, pp. 420-4, and Fichman 2004, pp. 266-70.

[f8] In Descent 2: 343, Darwin suggested that the view that male `savages' were indifferent to the beauty of women did not agree with the care women took in ornamenting themselves; he presented European opinions of how men of different peoples considered beauty in women in *Descent* 2: 344-54. Darwin mentioned the effective enslavement of women among `savages' as a practice that could counteract sexual selection (see Descent 2: 358, 366). For Wallace's views on peoples of the Malayan archipelago, see A. R. Wallace 1864c and A. R. Wallace 1869.

[f9] For Darwin's `essay' on human descent, see letter to A. R. Wallace, 26 February [1867]. Darwin touched on the roles of beauty and wealth in human sexual selection in *Descent* 1: 170, and 2: 356, 371. See also Correspondence vol. 12, letter to A. R. Wallace, 28 [May 1864] and n. 20.

Letter 5431 — Darwin, C. R. to Tegetmeier, W. B., 5 Mar [1867]

Darwin writes to ask for further evidence that a female will not select a male bird whose plumage has been damaged. ‘it has been stated that if the 2 long feathers in the tail of the male widow-Bird at the C. of Good Hope are pulled out, no female will pair with him.’

Darwin wrote in Descent 2:120: `the female widow-bird (Chera progne) disowns the male, when robbed of the long tail-feathers with which he is ornamented during the breeding-season.' He noted that he read this observation of Martin Karl Heinrich Lichtenstein's in *Rudolphi* (1812), p. 184; an annotated copy of *Rudolphi* is in the Darwin Library.

Letter 5465 — Smith, Andrew to Darwin, C. R., 26 Mar 1867

I strongly suspect will not find it very easy to give you any thing satisfactory as to what kind of women savage men prefer—[f6] so far as the Hottentot is concerned I can with certainty say he regards a woman with huge posteriors as first rate[f7] and he some time ago used to value highly such of the females as had very lengthened Nympæ but now he rather views these ugly developements as undesirable if not as deformities I have been told of some who had them so elongated as that they were able during sexual intercourse to encircle the mans loins and fix him by them until the appetite of both was thoroughly satisfied. I have never seen what would admit of any thing like that being effected still I have seen them pretty long.[f8] Now you must reconcile this speciality in the Hottentot's formation and let me know what brought it into existence. You must not say it is artificial seeing it comes without their using weights to bring it into existence and as a proof that it is not a formation of their manifacture it still begins to appear at puberty though there is nothing they would not now do to prevent it. In regard to the large posteriors I may mention that I once came in communication with a woman more than ordinarly gifted in that way and it was all but an impossibility for her to get on her feet when she was sitting unless where she could avail herself of some slope of the ground— Where such was open to her she had to work herself round till her back was directed up the slope and if it was considerable she rose with tolerable facility.— This Lady was esteemed a beauty and was the mother of several children.[f9]

[f6] Darwin had also discussed sexual selection as a means of forming the human races with Alfred Russel Wallace (see, for example, letter to A. R. Wallace, 26 February [1867] and n. 5, and letter from A. R. Wallace, 2 March [1867]).

[f7] Darwin recorded Smith's certainty on this point in Descent 2: 345. For nineteenth-century European perceptions of Khoikhoin women and of steatopygia, see Qureshi 2004.

[f8] Darwin placed Smith's information on the lengthened nymphae (inner labia) in a footnote written in Latin in Descent 2: 345 n. 53. Earlier in the century,

Georges Cuvier had lent scientific authority to travellers' accounts when he examined the cadaver of an African woman and described what he called the `Hottentot apron' (Cuvier 1817 in Fausto-Sterling 1995, pp. 33-6). On the fascination of nineteenth-century European naturalists with the genitalia of African women, including elongated labia, see also Schiebinger 1994, pp. 164-8.

[f9] Darwin included Smith's account of this woman in Descent 2: 346.

Letter 5473 — Tegetmeier, W. B. to Darwin, C. R., 29 Mar 1867

Tegetmeier stated that he did not think the appearance of the cock makes any difference to the female.

Letter 5475 — Darwin, C. R. to Tegetmeier, W. B., 30 Mar [1867]

Nevertheless I am still inclined from many facts strongly to believe that the beauty of the male bird determines choice of female with wild Birds, however it may be under domestication.

Letter 5565 — Kingsley, Charles to Darwin, C. R., 6 June 1867

The Duke of Argyll's book is very fair & manly. He cannot agree with you, but he writhes about under you as one who feels himself likely to be beat. What he says about the humming birds is his weakest part. He utterly overlooks sexual selection by the females, as one great branch of Natural selection. Why on earth are the males only (to use his teleological view) ornamented, save for the amusement of the females first? In his earnestness to press the point—(wh. I think you have really overlooked too much) that beauty in animals & plants is intended for the æsthetic education & pleasure of man, And (as I believe in my old fashioned way), for the pleasure of a God who rejoices in his works as a painter in his picture— In his hurry, I say, to urge this truth, he has overlooked that beauty in any animal must surely first please the animals of that species, & that beauty in males alone, is a broad hint that the females are meant to be charmed thereby—& once allow that any striking new colour wd. attract any single female, you have an opening for endless variation. His argument that the females of each species are as distinct as the males, is naught—for a change in the embryo wh. wd reproduce the peculiar markings of the father, in a male wd be surely likely to produce some change of markings in a female.

The Darwin Correspondence Project points out, ‘In January 1867, the duke of Argyll, George Douglas Campbell, published *The Reign of Law* (G. D. Campbell 1867), a book based on a series of articles that had appeared in 1865. In it he challenged aspects of Darwin's theory, especially the notion that beauty had an adaptive function, arguing instead that beauty in nature was designed by the creator for the aesthetic education of humans.’

Letter 5567 — Darwin, C. R. to Kingsley, Charles, 10 June [1867]

I have just finished reading the Duke's book & N. Brit. Rev.; & I shd very much like for my own sake to make some remarks on them, & as my amanuensis writes so clearly, I hope it will not plague you. The Duke's book strikes me as very well written, very interesting, honest & clever & very arrogant. How coolly he says that even J. S. Mill does not know what he means. Clever as the book is, I think some parts are weak, as about rudimentary organs, & about the diversified structure of humming birds. How strange it is that he shd freely admit that every detail of structure is of service in the flowers of orchids, & not in the beak of birds. His argument with respect to diversity of structure is much the same as if he were to say that a mechanic wd succeed better in England if he cd do a little work in many trades, than by being a first-rate workman in one trade. I shd like you to

read what I have said upon diversity of structure at 226 in the new Ed. of Origin, which I have ordered to be sent to you. Please also read what I have said (p. 238) on Beauty.) Other explanations with respect to beauty will no doubt be found out: I think the enclosed ingenious letter by Wallace is worth yr notice. Is is not absurd to speak of beauty as existing independently of any sentient being to appreciate it? And yet the Duke seems to me thus to speak. With respect to the Deity having created objects beautiful for his own pleasure, I have not a word to say against it but such a view cd hardly come into a scientific book. In regard to the difference between female birds I believe what you say is very true; & I can shew with fowls that the 2 sexes often vary in correlation. I am glad that you are inclined to admit sexual selection. I have lately been attending much to this subject, & am more than ever convinced of the truth of the view. You will see in the discussion on beauty that I allude to the cause of female birds not being beautiful; but Mr Wallace is going to generalize the same view to a grand extent, for he finds there is almost always a relation between the nature of the nest & the beauty of the female.

No doubt sexual selection seems very improbable when one looks at a peacock's tail, but it is an error to suppose that the female selects each detail of colour. She merely selects beauty, & laws of growth determine the varied zones of colour: thus a circular spot wd almost certainly become developed into circular zones, in the same manner as I have seen the black wing-bar in pigeons become converted into 3 bars of colour elegantly shaded into each other. The Duke is not quite fair in his attack on me with respect to “correlation of growth”'; for I have defined what I mean by it, tho' the term may be a bad one, whilst he uses another definition: “correlation of variation”' wd perhaps have been a better term for me. He depreciates the importance of natural selection, but I presume he wd not deny that Bakewell, Collins, &c had in one sense made our improved breeds of cattle, yet of course the initial variations have naturally arisen; but until selected, they remained unimportant, & in this same sense natural selection seems to me all-important.’

Letter 5648 — Darwin, C. R. to Wallace, A. R., 12–13 Oct [1867]

With respect to Beauty yr remarks on hideous objects & on flowers not being made beautiful except when of practical use to them strike me as very good.[f5]

On this one point of Beauty I can hardly think that the Duke was quite candid. I have used in the concluding paragraph of my present book precisely the same argument as you have, even bringing in the bull dog, with respect to variations not having been specially ordained.[f6]

[f5] See A. R. Wallace 1867c, p. 482. Campbell had argued that beauty conferred no selective advantage and therefore could only be explained with reference to a `Creator' (see, for example, G. D. Campbell 1867, pp. 242-8, and A. R. Wallace 1867c, pp. 480-1).

[f6] See A. R. Wallace 1867c, p. 484, and Variation 2: 431, where Darwin wrote, `Did [the Creator] cause the frame and mental qualities of the dog to vary in order that a breed might be formed of indomitable ferocity, with jaws fitted to pin down the bull for man's brutal sport?'

Letter 6002 — Darwin, C. R. to Forbes, David, [20 Mar 1868]

Darwin requested any notes on ideas of human beauty by natives who have little association with Europeans.

Letter 6754 — Darwin, C. R. to Reade, W. W., 21 May [1868]

Darwin asked about African ideas of beauty.

Letter 6639 — Tait, W. C. to Darwin, C. R., 2 Mar 1869

Tait described the evolution of behaviour and beauty by natural selection and Darwin's reply is in the book *Further Letters of Charles Darwin* (1903) described above.

Letter 6728 — Lyell, Charles to Darwin, C. R., 5 May 1869

> At the same time I told Wallace that I thought his arguments—as to the hand, the voice, the beauty, the symmetry, the naked skin & other attributes of man implying a preparation for his subsequent development—might easily be controverted. That a parrot endowed with the powers of Shakspeare might dictate the 'Midsummer Nights Dream' & that Michael Angelo if he had no better hand than belongs to some of the higher apes might have executed the statue of Lorenzo di Medici.
>
> In reply to this & other analogous comments Wallace said 'It seems to me that if we once admit the necessity of any action beyond "natural selection" in developing man we have no reason whatever for confining that action to his brain. On the mere doctrine of chances it seems to me in the highest degree improbable, that so many points of structure all tending to favour his mental developement should concur in man & in man alone of all animals. If the erect posture, the freedom of the anterior limbs from purposes of locomotion the powerful & opposable thumb, the naked skin, the great symmetry of form the perfect organs of speech & his mental faculties—calculations of numbers, ideas of symmetry, of justice, of abstract reasoning of the infinite of a future state & many others can not be shown to be each & all useful to man in the very lowest state of civilization, how are we to explain their coexistence in him alone of the whole series of organized beings? Years ago I saw a Bushman boy and girl in London & the girl played very nicely on the piano. Blind Tom the idiot negro had a musical ear or brain superior perhaps to that of any living man. Unless Darwin can shew me how this rudimentary or latent musical faculty in the lowest races can have been developed by survival of the fittest—can have been of use to the individual or the race, so as to cause those who possessed it to win in the struggle for life, I must believe that some other power caused that developement & so on with every other especially human characteristic. It seems to me that the 'onus probandi' will lie with those who maintain that man, body & mind, could have been developed from a quadrumanous animal by Natural Selection.'

Letter 7216 — Reade, W. W. to Darwin, C. R., 4 June 1870

Reade maintains the Negro's idea of beauty is the same as Whiteman's.

Letter 7227 — Mivart, St G. J. to Darwin, C. R., 11 June 1870

Mivart asks by what action Darwin believes bee, spider, and fly orchids came to resemble their namesakes and how the beauty of bivalves could have been produced by natural or sexual selection.

Letter 7228a — Darwin, C. R. to Mivart, St G. J., 13 June [1870]

In his reply to [7227] Darwin 'questions the significance of the supposed likeness of the bee, spider, and fly orchids to their presumed namesakes. He thinks that the beauty of shells is altogether incidental and of no use to the animals.'

Letter 7255 — Darwin, C. R. to Reade, W. W., 30 June [1870]

Darwin ‘thanks Reade for information on the Negro idea of beauty and other facts relating to expression.’

Letter 7363 — Reade, W. W. to Darwin, C. R., 9 Nov 1870

Reade writes that the ‘ideas of female beauty of W. African Negroes are on the whole the same as those of Europeans.’

Letter 7429 — Reade, W. W. to Darwin, C. R., 6 Jan [1871]

Reade writes about ‘sexual selection and the sense of beauty among the W. African Negroes.’

Letter 7435 — Reade, W. W. to Darwin, C. R., 10 Jan 1871

Reade ‘sends a quotation about Lycurgus and Spartan exposure of infants who were deemed defective and bibliographic references on sense of beauty and morals.’

Letter 7576 — Matthew, Patrick to Darwin, C. R., 12 Mar 1871

Matthew ‘encloses an article he wrote for the Scotsman [9 Mar 1871, p. 5]. Wishes he had time to write a critique of Descent . There is evidence of design and benevolence in nature. Beauty cannot be accounted for by natural selection.’

Letter 7617 — Darwin, C. R. to Morley, John, 24 Mar 1871

This letter is in Volume 1 of *More Letters of Charles Darwin*, pp. 324-7.[202] The letter is a reply to the notices of the *Descent of Man*, published in the *Pall Mall Gazette* of March 20th and 21st, 1871. In the article John Morley wrote:

> Mr. Darwin's work is one of those rare and capital achievements of intellect which effect a grave modification throughout all the highest departments of the realm of opinion[...]There is throughout the description and examination of Sexual Selection a way of speaking of beauty, which seems to us to be highly unphilosophical, because it assumes a certain theory of beauty, which the most competent modern thinkers are too far from accepting, to allow its assumption to be quite judicious[...]Why should we only find the aesthetic quality in birds wonderful, when it happens to coincide with our own? In other words, why attribute to them conscious aesthetic qualities at all? There is no more positive reason for attributing aesthetic consciousness to the Argus pheasant than there is for attributing to bees geometric consciousness of the hexagonal prisms and rhombic plates of the hive which they so marvellously construct. Hence the phraseology which Mr. Darwin employs in this part of the subject, though not affecting the degree of probability which may belong to this theory, seems to us to be very loose scientifically, and philosophically most misleading.

Darwin wrote in reply:

[202] *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters*, ed. by Darwin and Seward

> [...] You say that my phraseology on beauty is "loose scientifically, and philosophically most misleading." This is not at all improbable, as it is almost a lifetime since I attended to the philosophy of aesthetics, and did not then think that I should ever make use of my conclusions. Can you refer me to any one or two books (for my power of reading is not great) which would illumine me? or can you explain in one or two sentences how I err? Perhaps it would be best for me to explain what I mean by the sense of beauty in its lowest stage of development, and which can only apply to animals. When an intense colour, or two tints in harmony, or a recurrent and symmetrical figure please the eye, or a single sweet note pleases the ear, I call this a sense of beauty; and with this meaning I have spoken (though I now see in not a sufficiently guarded manner) of a taste for the beautiful being the same in mankind (for all savages admire bits of bright cloth, beads, plumes, etc.) and in the lower animals. If the blue and yellow plumage of a macaw pleases the eye of this bird, I should say that it had a sense of beauty, although its taste was bad according to our standard. Now, will you have the kindness to tell me how I can learn to see the error of my ways? Of course I recognise, as indeed I have remarked in my book, that the sense of beauty in the case of scenery, pictures, etc., is something infinitely complex, depending on varied associations and culture of the mind. From a very interesting review in the Spectator, and from your and Wallace's review, I perceive that I have made a great oversight in not having said what little I could on the acquisition of the sense for the beautiful by man and the lower animals. It would indeed be an immense advantage to an author if he could read such criticisms as yours before publishing.

Letter 7645 — Morley, John to Darwin, C. R., 30 Mar 1871

Morley questioned Darwin’s attribution of a sense of beauty to animals and his use of natural selection to explain phenomena and he felt it more appropriate to describe this as social selection.

Letter 7650 — Darwin, C. R. to Harrison, Frederic, 1 Apr [1871]

Darwin ‘discusses his concept of beauty. “I daresay I have made too much of natural selection”.’

Letter 7805 — Rohlf, G. F. to Darwin, C. R., 6 June 1871

Rohlf wrote about the ‘Natives' ideas of female beauty.’

Letter 8160 — Aubertin, J. J. to Darwin, C. R., 16 Jan 1872

Aubertin wrote that Capt. [Richard?] Burton disagreed with Darwin's notion of beauty in the abstract, and would like to meet him.

Letter 10971 — Darwin, C. R. to Romanes, G. J., 23 May 1877

Darwin thanked G. J. Romanes for the book by Grant Allen, *Physiological Aesthetics* (1877) and commented on the dispute over spontaneous generation and his investigation of Spiritualism.

Letter 10973 — Darwin, C. R. to Romanes, G. J., 27 May [1877]

Darwin commented on Romanes investigation of Spiritualism and the Grant Allen book.

Letter 10996 — Darwin, C. R. to Romanes, G. J., 11 June [1877]

Darwin discussed the effects of natural selection, the absence of blending between geographical races as a problem, the effect of natural selection on the productivity of an organism and on Romane's review of Grant Allen's book *Physiological Aesthetics*.

Letter 11004 — Romanes, G. J. to Darwin, C. R., 16 June [1877]

Romanes thinks Grant Allen has not made out his point in *Physiological Aesthetics*, but his fundamental principle probably has much truth.

Letter 11226a — Austin, A. D. to Darwin, C. R., 6 Nov 1877

Austin wrote of: 'his discovery that in the binocular vision of the stereoscope faces can be blended with decided improvement in beauty and suggests the possibility of experiments in thus photographing the faces of animals, different races and orders of men.'

Letter 11969 — Darwin, C. R. to Krause, E. L., 2 Apr 1879

Darwin wrote that it is "useless to hunt for correspondence between Dr Darwin and Samuel Johnson. They met only once and hated one another. Dr Darwin is said to have taken Henry Brooke, who published a poem entitled 'Universal Beauty', as a model.

Letter 12230 — Darwin, C. R. to Marshall, V. A. E. G., 14 September 1879

Darwin acknowledged that Ruskin was right about his feeling 'a deep and tender interest about the highly coloured hinder half of certain monkeys'.

Letter 13701 — Collier, John to Darwin, C. R., 22 Feb 1882

Collier 'thanks Darwin for his note on his book on the sense of beauty, *A Primer on Art* (1882)'.

More Letters of Charles Darwin

Francis Darwin and A. C. Seward (eds.) published *More Letters of Charles Darwin. A Record of His Work in a Series of Hitherto Unpublished Letters*, Vol. 1 (London: John Murray, 1903) in which the following letter is not included above but discussed aesthetics.

Letter 241: to John Morley, pp. 324-327

Down, March 24th, 1871.

> From the spirit of your review in the Pall Mall Gazette of my last book, which has given me great pleasure, I have thought that you would perhaps inform me on one point, withholding, if you please, your name.

You say that my phraseology on beauty is "loose scientifically, and philosophically most misleading."[203] This is not at all improbable, as it is almost a lifetime since I attended to the philosophy of aesthetics, and did not then think that I should ever make use of my conclusions. Can you refer me to any one or two books (for my power of reading is not great) which would illumine me? or can you explain in one or two sentences how I err? Perhaps it would be best for me to explain what I mean by the sense of beauty in its lowest stage of development, and which can only apply to animals. When an intense colour, or two tints in harmony, or a recurrent and symmetrical figure please the eye, or a single sweet note pleases the ear, I call this a sense of beauty; and with this meaning I have spoken (though I now see in not a sufficiently guarded manner) of a taste for the beautiful being the same in mankind (for all savages admire bits of bright cloth, beads, plumes, etc.) and in the lower animals. If the blue and yellow plumage of a macaw pleases the eye of this bird, I should say that it had a sense of beauty, although its taste was bad according to our standard.[204] Now, will you have the kindness to tell me how I can learn to see the error of my ways? Of course I recognise, as indeed I have remarked in my book, that the sense of beauty in the case of scenery, pictures, etc., is something infinitely complex, depending on varied associations and culture of the mind. From a very interesting review in the Spectator, and from your and Wallace's review, I perceive that I have made a great oversight in not having said what little I could on the of the sense for the beautiful by man and the lower animals. It would indeed be an immense advantage to an author if he could read such criticisms as yours before publishing. At page 11 of your review you accidentally misquote my words placed by you within inverted commas, from my Volume II., page 354: I say that "man cannot endure any great change," and the omitted words "any great" make all the difference in the discussion.[205]

Permit me to add a few other remarks. I believe your criticism is quite just about my deficient historic spirit, for I am aware of my ignorance in this line.[206] On the other hand, if you should ever be led to read again Chapter III., and especially Chapter V., I think you will find that I am not amenable to all your strictures; though I felt that I was walking on a path unknown to me and full of pitfalls; but I had the advantage of previous discussions by able men. I tried to say most emphatically that a great philosopher, law-giver, etc., did far more for the progress of mankind by his writings or his example than by leaving a numerous offspring. I have endeavoured to show how the struggle for existence between

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[203] ‘Mr. Darwin's work is one of those rare and capital achievements of intellect which effect a grave modification throughout all the highest departments of the realm of opinion[...]There is throughout the description and examination of Sexual Selection a way of speaking of beauty, which seems to us to be highly unphilosophical, because it assumes a certain theory of beauty, which the most competent modern thinkers are too far from accepting, to allow its assumption to be quite judicious[...]Why should we only find the aesthetic quality in birds wonderful, when it happens to coincide with our own? In other words, why attribute to them conscious aesthetic qualities at all? There is no more positive reason for attributing aesthetic consciousness to the Argus pheasant than there is for attributing to bees geometric consciousness of the hexagonal prisms and rhombic plates of the hive which they so marvellously construct. Hence the phraseology which Mr. Darwin employs in this part of the subject, though not affecting the degree of probability which may belong to this theory, seems to us to be very loose scientifically, and philosophically most misleading.’, *Pall Mall Gazette*, March 21st, 1871, page 1075.

[204] ‘What man deems the horrible contrasts of yellow and blue attract the macaw, while ball-and-socket-plumage attracts the Argus pheasant’, *Pall Mall Gazette*, March 21st, 1871, page 1075.

[205] ‘Mr. Darwin tells us, and gives us excellent reasons for thinking, that 'the men of each race prefer what they are accustomed to behold; they cannot endure change.' Yet is there not an inconsistency between this fact and the other that one race differs from another exactly because novelties presented themselves, and were eagerly seized and propagated?’, *Pall Mall Gazette*, March 21st, 1871.

[206] ‘In the historic spirit, however, Mr. Darwin must fairly be pronounced deficient. When, for instance, he speaks of the 'great sin of slavery' having been general among primitive nations, he forgets that, though to hold a slave would be a sinful degradation to a European to-day, the practice of turning prisoners of war into slaves, instead of butchering them, was not a sin at all, but marked a decided improvement in human manners.’, *Pall Mall Gazette*, March 21st, 1871.

> tribe and tribe depends on an advance in the moral and intellectual qualities of the members, and not merely on their capacity of obtaining food. When I speak of the necessity of a struggle for existence in order that mankind should advance still higher in the scale, I do not refer to the most, but "to the more highly gifted men" being successful in the battle for life; I referred to my supposition of the men in any country being divided into two equal bodies-viz., the more and the less highly gifted, and to the former on an average succeeding best.
>
> But I have much cause to apologise for the length of this ill-expressed letter. My sole excuse is the extraordinary interest which I have felt in your review, and the pleasure which I have experienced in observing the points which have attracted your attention. I must say one word more. Having kept the subject of sexual selection in my mind for very many years, and having become more and more satisfied with it, I feel great confidence that as soon as the notion is rendered familiar to others, it will be accepted, at least to a much greater extent than at present. With sincere respect and thanks...

Articles

Of the two hundred and fifty six articles listed on the Darwin Online website only one mentions ‘beauty’ and that is ‘Sexual selection in relation to monkeys’, *Nature, A Weekly Illustrated Journal of Science* 15 (2 November 1876), pp. 18-19.

> In the second place, I presume that no supporter of the principle of sexual selection believes that the females select particular points of beauty in the males; they are merely excited or attracted in a greater degree by one male than by another, and this seems often to depend, especially with birds, on brilliant colouring. Even man, excepting perhaps an artist, does not analyse the slight differences in the features of the woman whom he may admire, on which her beauty depends.

Darwin makes it clear that beauty is appreciated as a whole and is not seen as a collection of features except by someone specifically analysing slight differences. He also makes it clear that the reaction to beauty is simply excitation or attraction rather than aesthetic contemplation.

Early Writings of Charles Darwin (1974)

This section by Paul H. Barrett, called ‘Early Writings of Charles Darwin’ in Howard E. Gruber, *Darwin on Man: A Psychological Study of Scientific Creativity*; together with Darwin's early and unpublished notebooks was transcribed and annotated by Barrett, with a commentary by Gruber and a foreword by Jean Piaget, published by Wildwood House, London. It brings together the notebooks and various other notes by Darwin.

The Notebooks on Man, Mind and Materialism,

> Again there is beauty in rhythm & symmetry, of form—the beauty of [illegible] as Norfolk Isd fir shows this, or sea weed, etc., etc.—this gives beauty to a single tree,—& the leaves of the fore-ground either owe their beauty to absolute form or to the repetition of similar forms as in angular leaves,—(this Rhythmical beauty is shown by Humboldt from occurrence in Mexican & Graecian to be single cause)25 this symmetry & rhythm applies | to the view as a whole.[See note 26] —Colour /and light/ has very much to do, as may be known by autumn, on clear day.—3d pleasure association warmth, exercise, birds singings (p. 273, this repeats Notebook M above but adds the note 29)

> Why do bulls & horses, animals of different orders turn up their nostrils when excited by love? Stallion licking udders of mare strictly analogous to men's affect for women's breasts. Dr. Darwin's [see note 49] theory probably wrong, otherwise horses would have idea of beautiful forms. (p. 278)
>
> 26. In Zoonomia, p. 145, Erasmus Darwin says, "A Grecian temple may give us the pleasurable idea of sublimity [...]" and "[...] when any object of vision is presented to us, which by its waving or spiral lines bears any similitude to the form of the female bosom, whether it be found in a landscape with soft gradations of rising and descending surface, or in the form of some antique vases [...] , we feel a general glow of delight." See also n. 49.
>
> 49. Zoonomia, p. 145: "Our perception of beauty consists in our recognition by the sense of vision of those objects, first, which have before inspired our love by the pleasure, which they have afforded to many of our senses; as to our sense of warmth, of touch, of smell, of taste, hunger and thirst; and secondly, which bear any analogy of form to such objects." And on page 253: "So universally does repetition contribute to our pleasure in the fine arts, that beauty itself has been defined by some writers to consist in a due combination of uniformity and variety." See also n. 26.

Barrett comments on Darwin's writing on free will, beauty and instinct:

> Birds are born with a capacity to sing: those in England do so, but those in Tierra del Fuego do not. This shows that birds have "hereditary knowledge like that of man [...]" (M 32) The reader should notice that in choosing this example Darwin may be shifting away from his earlier certainty that man is unique in his capacity for cultural transmission of knowledge. (M 27, pp. 309-9)
>
> Another example of the interaction of heredity and experience captures his attention. All men, he believes, have "an instinctive feeling" for beauty. What it is that particular men admire depends on particular circumstances which determine the "acquiring" of particular notions of beauty.
>
> But if it is true, as he argues in this passage, that "every action [is] determined by hereditary constitution, example of others or teaching of others" (M 27), then the question arises: what need have we for the notion of free will? Which thought or action of a large number of possibilities will actually occur may depend not on free will but on natural law: "I verily believe free will & chance are synonymous.—Shake ten thousand grains of sand together & one will be uppermost,—so in thoughts one will rise according to law." (M 31)
>
> "Mine is a bold theory, which attempts to explain, or asserts to be explicable every instinct in animals." (D 26)
>
> Beauty and imagination. We see from Darwin's general attitude that he has taken the whole province of living things as his subject matter. The topic of instinct is included, and as we have just seen, in his view, a feeling for beauty is instinctive. This provides adequate justification for him to take time out to consider the psychology of aesthetics and imagination. We now know how Darwin eventually used these ideas in writing the Descent of Man, but if we consider only what he wrote up to this point it is not clear exactly how these notes fit into the argument he is developing at the moment. (pp. 28, 29, 33-41)
>
> He expands on a remark made by his sister, leading to the following points: It is worth distinguishing among various related mental processes—memory, imagination, and invention. Early memories are largely of things seen, and in the form of visual images, "a set of sketches." Again, he makes a point about the distinction between what is stored in memory traces and what can be voluntarily remembered—children can recognize a familiar story that they "have not imagination enough to recall." (M 28)
>
> The preceding points are intrusions in another line of thought, with his remark on page 32 about beauty as an instinct providing the bridge between his just previous discussion of memory and instinct and the present discussion of beauty and imagination.

The Reynolds's *Discourse* mentioned above in Notebook N refers to:

> Reynolds, Joshua, The Literary Works of Sir Joshua Reynolds to Which Is Prefixed a Memoir of the Author by H. W. Beechy, 2 vols., Cadell, London, 1835, Vol. 2, pp. 131–132: "[A study of Italian Masters] will show how much their principles are founded on reason, and, at the same time, discover the origin of our ideas of beauty[...] . To distinguish beauty, then, implies the having seen many individuals of that species [...] a Naturalist, before he chose one as a sample [blade of grass] [...] selects as a Painter does, the most beautiful, that is, the most general form of nature."

Also, the taste referred to in Notebook N, could refer to:

> In his copy of Zoonomia, Vol. 1 (now in the Cambridge University Library), p. 253, Darwin wrote in pencil in the margin: "tastes hereditary do [ditto]." In the adjacent text Erasmus discusses the role of repetition and imitation in developing concepts of pleasure and beauty: "So universally does repetition contribute to our pleasure in the fine arts, that beauty itself has been defined by some writers to consist in a due combination of uniformity and variety[...] . The origin of this propensity to imitation has not, that I recollect, been deduced from any known principle. [...]" p. 254: "[...] our perceptions themselves are copies, that is, imitations of some properties of external matter; and the propensity to imitation [...] thus constitutes all the operations of our minds." See also Macculloch, John, Proofs and Illustrations of the Attributes of God, etc., 3 vols., Duncan, London, 1837, Vol. 3, Chapters: "On the Pleasures provided through the Senses of Odour and Taste; Sense of Seeing, Beauty; Sense of Hearing, Music, and on Pain."

Barrett also notes with reference to Notebook N, pp. 25-33:

> The origin of taste. In Darwin's view, aesthetic taste is acquired, both in the history of the individual and in the history of the species. Some idea of beauty is universal, but the particular objects to which we attach it depend on our inheritance from our immediate ancestors: "a mountaineer born out of country yet would love mountains"—he would not need personal experience with mountains to acquire a taste for them. (N 26)
>
> But Darwin does not seem to mean that there is an entirely arbitrary connection between experience and our ideas of beauty. He cites, a bit vaguely, two counter-examples. There is something intrinsically ugly about "great masses of rock"—which, because of the connection, makes new buildings look ugly, but not old ones like Windsor Castle. In language there are intrinsically gentle sounds, and other sounds for other feelings, which accounts for some of the expressive power of poetry.
>
> In two ways, then, Darwin avoids a radical empiricism: The relevant experience need not occur in the individual life history; and the development of aesthetic taste depends, at least in part, on certain intrinsic properties of the sensuous experience.
>
> In his quotation from the Discourses on Art of Sir Joshua Reynolds, his own point of view is clear. There is both a universal and a particular aspect to the expression of feeling: "'The general idea of showing respect is by making yourself less, but the manner … is matter of custom.'" (N 32)

Barrett analyses Darwin's *Old and Useless Notes* (c. 1837).

> [OUN22] Lessing's Laocoön 2d Lect—The object of art, sculpture & painting, is beauty—which he thinks is a better definition than Winklemen's, who says it is simplicity with grandeur of character.—Hence Lessing shows expression of pain cannot be respected.[47, see note below] But what is beauty?—it is an ideal standard, by which real objects are judged: & how obtained—implanted in our bosoms—how comes it there?
>
> [OUN23] Laocoön p. 75 "The beauties developed in a work of art are not approved by the eye itself, but by the imagination through the medium of the eye;" he will allow the secondary pleasure of harmonious colours etc etc surely to be added.

[OUN24] Lessings Laocoön, p. 125—says new subjects are not fit for painter or sculpture, but rather subjects which we know,[49, see note below] it is therefore the embodying of a floating idea,—as statue of beauty, is of the "beau ideal," my instinctive impression

47. Lessing, Gotthold Ephraim, Laocoön. Nathan the Wise. Minna von Barnhelm, William A. Steel, Ed., London, J. M. Dent, 1930: "The general distinguishing excellence of the Greek masterpieces in painting and sculpture Herr Winkelmann places in a noble simplicity… . in arrangement and in expression." And: "And if we now refer this to the Laocoön, the motive for which I am looking becomes evident. The master was striving after the highest beauty, under the given circumstances of bodily pain. This, in its full deforming violence, it was not possible to unite with that… . the aspect of pain excites discomfort without the beauty of the suffering subject changing this discomfort into the sweet feeling of compassion."

49. Lessing, Laocoön: "[The artist] remains within the narrow range of a few designs, become familiar both to him and to everybody, and directs his inventive faculty merely to changes in the already known and to new combinations of old subjects. That, too, is actually the idea which the manuals of painting connect with the word Invention …

Books to be Read (1838-1851)

Darwin kept a notebook called *Books to be Read* in which he listed the books he intended to read and the books he had read. It is noteworthy that the list does not include Plato, Burke, Hogarth or Kant which we know he read so it not a complete list. There is a brief mention that he must read Aristotle but no specific books are mentioned. Note that I have not included literary works, of which there are many, including works of Shakespeare, Austin, Dickens, Carlyle, various books of poetry and many more.

Reynolds's *Discourses* [Reynolds 1778]. Joshua Reynolds, 1778. *Seven Discourses Delivered in the Royal Academy by the President*, London. [Edition unknown].

Lessing's *Laocoön* [Lessing 1836]. Gotthold Ephraim Lessing, 1836. *Laocoön; or, the Limits of Poetry and Painting*, translated by William Ross, London.

Sir. Charles Bell *Anatomy of Expression*. [Bell 1806]. Charles Bell, 1806, *Essays on the Anatomy of Expression in Painting, London*, [3d ed. (1844) in Darwin Library].

Leslie's *Life of Constable* [Leslie 1843]. Charles Robert Leslie, 1843, *Memoirs of the Life of John Constable, R.A.*, composed chiefly of his letters. London. [Edition unknown].

Life of Sir D. Wilkie [Cunningham 1843]. Allan Cunningham, 1843, *The Life of Sir David Wilkie; with his Journals, Tours, and Critical Remarks on Works of Art*. [Edited by Peter Cunningham.] 3 vols. London.

Jeffrey, *Alison on Taste*. *Review* [Jeffrey 1811]. Francis Jeffrey, 1811, 'Alison on Taste', *Edinburgh Review*, 18, pp. 1-46.

Books Read and to be Read (1852-1860)

Knox on *Anatomy & Art*. London Library (read) [Knox 1852]. Robert Knox, 1852, *Great Artists and Great Anatomists; a Biographical and Philosophical Study*, London.

Haydon's *Autobiography* (very interesting) [Haydon 1853]. Benjamin Haydon, 1853, *The Life of B. R. Haydon from his Autobiography and Journals*, edited and compiled by Tom Taylor. 3 vols. London.

He also read many literary books including William Wilkie Collins, *The Woman in White* (1860) and miscellaneous books such as Samuel Smiles *Self Help* (1859).

Manuscripts

There are images of about 20,000 manuscripts and private papers on the Darwin Online website and a search on the stem 'beaut*' gives three hundred and thirty five references although most use the term descriptively. The following entries are those that discuss beauty. The 'Beagle Diary' entries and notebook entries were discussed earlier and so are excluded.

CUL-DAR189.113, no date, an abstract of Hogarth's *Analysis of Beauty* 'Laocoön': including pp. 234-252.

CUL-DAR85.A65, no date, Bichat says if everyone cast in same mould there wd be no beauty.

CUL-DAR85.A91, 1856.05.05, Galton / He thinks savages & ourselves have different ideas of Beauty

CUL-DAR47.20, 1864.12.00, D[uke] of Argyll has advanced beauty - Humming Birds

CUL-DAR47.21, 1865.09.30, Utilitarianism / Nat[ural] Selection / After Birds & Butterflies beauty

CUL-DAR84.1.181, 1866.11.24, Feeling of beauty among animals `Athenaeum': 681

CUL-DAR53.1.B35, 1872.11.14, From remark in Athenaeum about beauty, in "Introduction" when I speak of

CUL-DAR87.90-91, 1871.05.24, Beauty / An object is beautiful when it excites pleasure from form colour. These two pages are interesting, as they were only

transcribed by Kees Rookmaaker and John van Wyhe in July 2012. The following transcription was made:

> Beauty May 24 — 71
>
> ~~An~~
>
> An object is beautiful when it excites pleasure from form, colour, *[*shiny*]* &c in some beholder, & so into certain sounds in former or in certain *[*succeccions*]*. The beholder may be any animal or man; but we generally ~~took~~ consider the latter alone.
>
> Beauty in certain or most birds we very easily infer excites the sense of beauty of the individuals of the same species (whether of any other animal is very doubtful) & of man. — There is ~~not to~~ no best reason to suppose that the most beautiful ~~coral~~ shells, & certainly not the most beautiful corals or flowers excite a sense of beauty in other shells or corals or flowers but only in the mind of men; so that to question why such objects are beautiful resolves itself into why the mind of men is so constituted that ~~we~~ it receives pleasure from certain shells, corals & flowers —
>
> Then again in its simplest form apparently reduces itself at why the *[*eyes*]* have pleasure from certain [91] brilliant colours & symmetrical or complex forms & curves which we call graceful.
>
> In the case of the higher animals their beauty vary, & we have good reason to believe does give pleasure to individuals of the same species, & then when confined to one sex, we have a right to enquire why the beauty has been acquired by one sex, & to *[illeg]* if it by the other sex or by both sexes. —

This document does not appear to have been examined closely before. It appears to be notes for certain sections of *Descent*, 1st edn, Vol. 1, such as pp. 64, 105, 76-78 and 353-354 but *Descent* was published in January and the notes are dated May so they may be further thoughts for the second edition published in 1874. It also reads like some notes from his ‘Notebook M’, pp. 36-37. What makes it interesting is that it is one of the few places where Darwin appears to suggest that simple beauty is perceived by man and not by other animals.[207] Darwin implies that other animals do not find corals, shells and flowers beautiful. He says that only the 'mind of men is so constituted'. That is, he has identified a capability that distinguishes us from other animals, something he denies elsewhere. For example, in *Expression* he writes: ‘It can hardly be doubted that many animals are capable of appreciating beautiful colours and even forms, as is shown by the pains which the individuals of one sex take in displaying their beauty before those of the opposite sex’ (p. 364).

In Descent, p 353 he wrote: ‘No doubt the perceptive powers of man and the lower animals are so constituted that brilliant colours and certain forms, as well as harmonious and rhythmical sounds, give pleasure and are called beautiful’. In this note, he starts by writing: ‘The beholder [of a beautiful object] may be any animal or man’. Therefore, it is likely that in the second paragraph he was thinking about humans rather than excluding other animals.

[207] He also wrote in ‘Notebook B’, p. 161: ‘Animals have no notions of beauty, therefore instinctive feelings against other species for sexual ends, whereas man has such instincts very little.’

Appendix 2: Selected Quotations

This Appendix brings together a small number of selected quotations from primary sources and a summary of the views of important authors.

George Campbell (8th Duke of Argyll)

The following extracts are from the *Reign of Law*.

> Even now there is abundant evidence that although Man was intended to admire beauty, beauty was not intended only for Man's admiration. Nowhere is ornament more richly given, nowhere is it seen more separate from the use, than in those organisms of whose countless millions the microscope alone enables a few men for a few moments to see a few examples, There is no better illustration of this than a class of forms belonging to the border-land of animal and vegetable life called the *Diatomaceae*, which, though invisible to the naked eye, play an important part in the economy of Nature. They exist almost everywhere, and of their remains whole strata, and even mountains, are in great part composed. They have shells of pure silex, and these, each after its own kind, are all covered with the most elaborate ornament—striated, or fluted, or punctured, or dotted in patterns which are mere patterns, but patterns of perfect, and sometimes of most complex beauty. No graving done with the graver's tool can equal that work in gracefulness of design or in delicacy, and strength of touch.[1]
>
> Is it likely that this universal aim and purpose of the mind of Man should be wholly without relation to the aims and purposes of his Creator? He that formed the eye to see beauty, shall He not see it? He that gave the human hand its cunning to work for beauty, shall His hand never work for it? How, then, shall we account for all the beauty of the world—for the careful provision made for it where it is only the secondary object not the first?[2]
>
> The “eyes” of the Peacock's train are wonderful examples of ornament but they do not represent anything except their own harmonies of colour. The “eyes” of the Argus Pheasant are like the “ball and socket” ornament, which is common in the decorations of human art. It is no answer to this argument in respect to beauty, that we are constantly discovering the use of beautiful structures in which the beauty only and not the usefulness had been hitherto perceived. The harmonies on which all beauty probably depends are so minutely connected in Nature that “use” and ornament may often both arise out of the same conditions. Thus, some of the most beautiful lines on the surface of shells, are simply the lines of their annual growth which growth has followed definite curves and it is the “law” of these curves that is beautiful in our eyes. Again, the forms of many fish which are so beautiful, are also forms founded on the lines of least resistance. The same observation applies to the form of the bodies and of the wings of birds. Throughout Nature ornament is perpetually the result of conditions and arrangements fitted to use, and contrived for the discharge of function. But the same principle applies to human art, and few persons are probably aware how many of the mere ornaments of architecture are the traditional representation of parts which had their origin in essential structure.[3]
>
> And so the fact that Natural Selection cannot have operated on structures of mere beauty and variety is no proof that the theory of Natural Selection is false but only that it is incomplete. It does not account for the origin of any structure; and it accounts for the preservation of only a certain number Surely then, Mr Darwin assigns to his “law” of Natural Selection a range far wider than really belongs to it, when, on the strength of it, he denies that beauty for its own sake can be an end or object in Organic Forms. He says—“This doctrine if true would be absolutely

1 Campbell, *The Reign of Law* (1867), p. 199.
2 *ibid*., p. 201.
3 *ibid*., pp. 203-04.

> fatal to my theory." Why should this be fatal to his theory except on the supposition that Natural Selection gives a complete account both of the Origin of new Forms, (of which, in reality, it gives no account at all,) and of their preservation, of which it does give some account, but one which is only partial?[4]

John Ruskin

The following quotations are taken from E. T. Cook, and Alexander Wedderburn, book *The Works of John Ruskin*. The index was used to find all references to Darwin and related people and topics.

Ruskin first met Darwin in 1837 when he was eighteen and Darwin twenty eight and Ruskin had attended a lecture by Darwin at the Geological Society, They met at a dinner party given by Dr Buckland and 'got together, and talked all the evening'.[5] Many years later, in 1879-1880, Ruskin stayed at Brantwood and when Darwin stayed at Coniston he 'came in sometimes to dinner'.[6]

In the Introduction to Vol. 19 the relationship with Darwin was discussed:

> Professor Norton, who with his wife and family was at this time staying at Reston in Kent, has described how "Ruskin did everything to make our stay in the country pleasant, coming over to see us, often writing and sending books or water-colour drawings by Turner, himself, and others, to light up the somewhat dull rooms of the little old Rectory in which we were living; sending also gifts to my little children. […] To give pleasure was his delight." Keston is close to Downe, and on one occasion Professor Norton arranged a meeting between Ruskin and Darwin. "Ruskin's gracious courtesy," he says, "was matched by Darwin's charming and genial simplicity. Ruskin was full of questions which interested the elder naturalist by the keenness of observation and the variety of scientific attainment which they indicated, and their animated talk afforded striking illustration of the many sympathies that underlay the divergence of their points of view and of their methods of thought. The next morning Darwin rode over on horseback to say a pleasant word about Ruskin, and two days afterward Ruskin wrote, 'Mr. Darwin was delightful,'" At a later date Darwin came over to see Ruskin at Denmark Hill, and Ruskin visited him at Downe. Darwin's biographer gives all amusing account of his father's courteous but feigned appreciation of the treasures of Denmark Hill:—
>
> "This way of looking at himself as all ignoramus in all matters of art was strengthened by the absence of pretence, which was part of his character. With regard to questions of taste, as well as to more serious things, lie always had the courage of his opinions. I remember, however, an instance that sounds like a contradiction to this: when he was looking at the Turners in Mr. Ruskin's bedroom, he did not confess, as he did afterwards, that he could make out absolutely nothing of what Mr. Ruskin saw in them. But this little pretence was not for his own sake, but for the sake of courtesy to his host. He was pleased and amused when subsequently Mr. Ruskin brought him some photographs of pictures (I think Vandyke portraits), and courteously seemed to value my father's opinion about thein.

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4 *ibid*., p. 232.

5 John Ruskin, *The Works of John Ruskin*, Library Edition, ed. by E. T. Cook and A. Wedderburn, 39 vols (London: George Allen, 1903-12), XXVI, p. xx. Dr Buckland was Reader in Geology at Oxford and he allowed Ruskin to prepare diagrams for his lectures. Also, see *ibid*., XXXVI, p. lxxiii and the letter at *ibid*., p. 14.

6 Ruskin, *The Works of John Ruskin* (1903-12), XXXIII, p. xxi.

> There is a reference in this volume to Darwin's "unwearied and unerring investigations";' and it could be wished that Ruskin had always observed the same amenity of tone in his published criticisms of the great naturalist.[7]

The comment is remarkable given the sentiments Ruskin expresses concerning Darwin's ideas in the following extracts. Also, see Ruskin's letter to Norton Vol. 36, pp. 552-556.

Volume 4, Chapter 11, General Inferences Respecting Typical

> I have now enumerated and, in some measure, explained those characteristics of *mere* matter by which I conceive it becomes agreeable to the Theoretic faculty, under whatever form, dead, organized, or animated, it may present itself. It will be our task in the succeeding volume to examine, and illustrate by examples, the mode in which these characteristics appear in every division of creation, in stones, mountains, waves, clouds, and all organic bodies, beginning with vegetables, and then taking instances in the range of animals, from the mollusc to man; examining how one animal form is nobler than another, by the more manifest presence of these attributes, and chiefly endeavouring to show how much there is of admirable and lovely, even in what is commonly despised. At present I have only to hark the conclusions at which we have as yet arrived respecting the rank of the Theoretic faculty, and then to pursue the inquiry farther into the nature of vital beauty.
>
> As I before said, I pretend not to have enumerated all the sources of material beauty, nor the analogies connected with them ; it is probable that others may occur to many readers, or to myself, as I proceed into more particular inquiry ; but I am not careful to collect all evidence within reach on the subject. I desire only to assert and prove some certain principles, and by means of these to show something of the relations which the material works of God bear to the human mind, leaving the subject to be fully pursued, as it, only can be, by the ardour and affection of those whom it may interest.[8]

Ruskin added the following to the 1883 addition:

> Before attempting these generalizations of the subject, I ought to have given one or two simple examples of the practical application of the foregoing section: : and to have shown how, for instance, a wild rose is pretty because it has concentric petals,—because each petal is bounded by varying curves,— because these curves are dual, and symmetrically y opposed,—because the live petals are bent into the form of a cup which gives them gradated depth of shade,—because the shade as well as the light is coloured with crimson and gold,—and because both the gold and the crimson are used in their most subtle degrees and tints. I will not, however, now alter or interrupt the course of the old essay, but must at least make the reader clearly aware, that hitherto, the circumstances said to be productive of beauty have been simply those which please the eye, wherever they occur; that blue is thought of as an agreeable colour, when it is a pure blue, whether in a butterfly's wing, or in the sky ; and a consistently varied curve is thought of as a pleasant line, whether it limits a mountain, a wave, or a limb. And chiefly I must reiterate, with reference to modern narrownesses or meannesses of thought, that the pleasure of the eye is never confused with the blind and temporary instincts of the blood ; and that, briefly, and always, a girl is praised because she is like a rose,—not a rose because it is like a girl.

A Joy Forever (1857, 1880), Vol. 16

> 181. There is no need that I should be careful in enumerating the various modes, analogous to this, in which the Natural selection of which we have lately heard,

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7 *ibid*., XIX, pp. xliv-xlv.

8 *ibid*., IV, pp. 142-43, 'Modern Painters 2'.

> perhaps, somewhat more than enough, provokes and approves the Professorial selection which I am so bold to defend.[9]

Lecture III: Modern Manufacture and Design

A lecture delivered at Bradford, 1 March, 1859.

> 78. Observe, then, first—the only essential distinction between Decorative and other arts is the being fitted for a fixed place; and in that place, related, either in subordination or in command, to the effect of other pieces of art. And all the greatest art which the world has produced is thus fitted for a place, and subordinated to a purpose. […]
>
> 74. Get rid, then, at once of any idea of Decorative art being a degraded or a separate kind of art. […] Portable art—independent of all place—is for the most part ignoble art.[10]

In the *Queen of the Air*, part II, 'Athena Keramitis' (Vol. 19, p. 355) Ruskin talked about 'protoplasm', a word first used by Hugo Von Mohl in 1846 and popularized in England by Huxley in 1868 in his address on 'The Physical Basis of Life'.

> 62. And we are led to feel this still more strongly, because all the distinctions of species,' both in plants and animals, appear to have similar connection with human character. Whatever the origin of species may be, or however those species, once formed, may be influenced by external accident, the groups into which birth or accident reduce them have distinct relation to the spirit of man. It is perfectly possible, and ultimately conceivable, that the crocodile and the lamb may have descended from the same ancestral atom of protoplasm ; and that the physical laws of the operation of calcareous slime and of meadow grass, on that protoplasm, may in time have developed the opposite natures and aspects of the living frames ; but the practically important fact for us is the existence of a power which creates that calcareous earth itself ;—which creates that, separately, and quartz, separately, and gold, separately, and charcoal, separately ; and then so directs the relations of these elements that the gold may destroy the souls of men by being yellow ; and the charcoal destroy their souls by being hard and bright ; and the quartz represent to them an ideal purity ; and the calcareous earth, soft, may beget crocodiles, and dry and hard, sheep ; and that the aspects and qualities of these two products, crocodiles and lambs, may be, the one repellent to the spirit of man, the other attractive to it, in a quite inevitable way, representing to him states of moral evil and good, and becoming myths to him of destruction or redemption, and, in the most literal sense, "Words" of God.
>
> 63. And the force of these facts cannot be escaped from by the thought that there are species innumerable, passing into each other by regular gradations, out of which we choose what we most love or dread, and say they were indeed prepared for us. Species are not innumerable ; neither are they now connected by consistent gradation. They touch at certain points only ; and even then are connected, when we examine them deeply, in a kind of reticulated way, not in chains, but in chequers ; also, however connected, it is but by a touch of the extremities, as it were, and the characteristic form of the species is entirely individual.

Ruskin added the note,

> * The facts on which I am about to dwell are in nowise antagonistic to the theories which Mr. Darwin's unwearied and unerring investigations are every day rendering more probable. The aesthetic relations of species are independent of their origin. Nevertheless, it has always seemed to me, in what little work I have

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9 *ibid*., XVI, p. 166, 'A Joy For Ever'.
10 *ibid*., p. 320, 'Modern Manufacture and Design'.

done upon organic forms, as if the species mocked us by their deliberate imitation of each other when they met: yet did not pass one into another.

Lectures on Art, The Relation of Art to Use, Vol. 20

106. Take Botany, for instance. Our scientific botanists are, I think, chiefly at present occupied in distinguishing species, which perfect methods of distinction will probably in the future show to be indistinct ;—in inventing descriptive names of which a more advanced science and more fastidious scholarship will show some to be unnecessary, and others inadmissible ; 2—and in microscopic investigations of structure, which through many alternate links of triumpliant discovery that tissue is composed of vessels, and that vessels are composed of tissue, have not hitherto completely explained to us either the origin, the energy, or the course of the sap ; and which, however subtle or successful, bear to the real natural history of plants only the relation that anatomy and organic chemistry bear to the history of men.

In the meantime, our artists are so generally convinced of the truth of the Darwinian theory that they do not always think it necessary to show any difference between the foliage of an elm and an oak ; and the gift-books of Christmas have every page surrounded with laboriously engraved garlands of rose, shamrock, thistle, and forget-me-not, without its being thought proper by the draughtsman, or desirable by the public, even in the case of those uncommon flowers, to observe the real shape of the petals of any one of them.[11] (pp. 100-101)

Aratra Pentelici, III Imagination, Vol. 20

101. The unconsciousness of their antagonism is the most notable characteristic of the modern scientific mind; and I believe no credulity or fallacy admitted by the weakness (or it may sometimes rather have been the strength) of early imagination, indicates so strange a depression beneath the due scale of human intellect, as the failure of the sense of beauty in form, and loss of faith in heroism of conduct, which have become the curses of recent science,* art, and policy.[12]

Ruskin added the footnote,

* The best modern illustrated scientific works show perfect faculty of representing monkeys, lizards, and insects; absolute incapability of representing either a man, a horse, or a lion.

In his Instructions in *Practice of Elementary Drawings* (Vol. 21, pp. 161-310) he describes the importance of observation when practising drawing plants rather than their Darwinian taxonomy. ‘It is not of the least consequence to you at present whether the Darwinian theory be true or false.’[13]

For Ruskin sight is our most important sense and is a spiritual not a mechanical operation. He writes, ‘You do not see *with* the lens of the eye. You see *through* that, and by means of that. But you see with the soul of the eye.’

99. A great physiologist said to me the other day—it was in the rashness of controversy, and ought not to be remembered, as a deliberate assertion, therefore I do not give his name,[14] still he did say—that sight was " altogether mechanical." The words simply meant, if they meant anything, that all his

[11] *ibid*., XX, pp. 100-01, ‘Lectures on Art, The Relation of Art to Use’.
[12] *ibid*., p. 267, ‘Aratra Pentelici, III Imagination’.
[13] *ibid*., XXI, p. 242, ‘Practice of Elementary Drawings’.
[14] He is named, however, in *ibid*., X, p. 373, ‘The Story of Arachne’, as Huxley.

> physiology had never taught him the difference between eyes and telescopes. Sight is an absolutely spiritual phenomenon; accurately, and only, to be so defined ; and the " Let there be light," is as much, when you understand it, the ordering of intelligence, as the ordering of vision. It is the appointment of change of what had been else only a mechanical effluence from things unseen to things unseeing,—from stars that did not shine to earth that could not perceive ;—the change, I say, of that blind vibration into the glory of the sun and moon for human eyes ; so rendering possible also the communication out of the unfathomable truth, of that portion of truth which is good for us, and animating to us, and is set to rule over the day and night of our joy and sorrow.[15]

In *The Eagle's Nest*, 'The Story of Halcyon', Vol. 22, p. 246-247, Ruskin used the argument that because animals follow certain patterns of structure then Darwinism must be false. The implication is that Darwinism is completely unconstrained and will allow any structure to develop.

> 183. To take the simplest of instances,—which happens also to be one of the most important to you as artists,—it is appointed that vertebrated animals shall have no more than four legs, and that, if they require to fly, the two legs in front must become wings, it being against law that they should have more than these four members in ramification from the spine.
>
> Can any law be conceived more arbitrary, or more apparently causeless? What strongly planted three-legged animals there might have been! what symmetrically radiant five-legged ones! what volatile six-winged ones! what circumspect seven-headed ones! Had Darwinism been true, we should long ago have split our heads in two with foolish thinking, or thrust out, from above our covetous hearts, a hundred desirous arms and clutching hands; and changed ourselves into Briarean Cephalopod. But the law is around us, and within; unconquerable; granting, up to a certain limit, power over our bodies to circumstance and will; beyond that limit, inviolable, inscrutable, and, so far as we know, eternal.[16]

On the following page, he continued to criticize Darwinism indirectly, refusing to deny its 'fallacy' but finding no 'logical argument in its favour'.

> 185. Respecting the origin of these variously awkward, imperfectly, or grotesquely developed phases of form and power, you need not at present inquire : in all probability the race of man is appointed to live in wonder, and in acknowledgment of ignorance; but if ever he is to know any of the secrets of his own or of brutal existence, it l assuredly be through discipline of virtue, not through inquisitiveness of science. I have just used the expression, "I had Darwinism been true," implying its fallacy more positively than is justifiable in the present state of our knowledge ; but very positively I can say to you that I have never heard yet one logical argument in its favour, and I have heard, and read, many that were beneath contempt. For instance, by the time you have copied one or two of your exercises on the feather of the halcyon, you will be more interested in the construction and disposition of plume-filaments than heretofore; and you may, perhaps, refer, in hope of help, to Mr. Darwin's account of the peacock's feather. I went to it myself, hoping to learn some of the existing laws of life which regulate the local disposition of the colour. But none of these appear to be known; and I am informed only that peacocks have grown to be peacocks out of brown pheasants, because the young feminine brown pheasants like fine feathers. Whereupon I say to myself, " Then either there was a distinct species of brown pheasants originally born with a taste for fine feathers; and therefore with remarkable eyes in their heads,—which would be a much more wonderful distinction of species than being born with remarkable eyes in their tails.[17]

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15 *ibid*., XXII, p. 194, 'The Eagle's Nest'.
16 *ibid*., p. 246, 'The Eagle's Nest'.
17 *ibid*., p. 247, 'The Eagle's Nest'.

In *Val D'Arno*, VII Marble Rampant, Vol. 23, p. 106 he linked the waves surrounding Poseidon with the use of the crocket at Troyes.

> Seventeen hundred years are between them, but the same mind is in both. I wonder how many times seventeen hundred years Mr. Darwin will ask, to retrace the greek designer of this into his primitive ape; or how many times six hundred years of such improvements as *we* have made on the church of St. Urbain will be needed in order to enable or descendants to regard the designers of that as only primitive apes.[18]

It is not clear exactly what point Ruskin is making in the previous passage but it is some type of rhetorical device designed to undermine Darwin's ideas by contrasting the beauty of St. Urbain with the incongruity of an ape. The answer Ruskin appears to suggest is 'no time, no matter how long, would be sufficient'.

In *Mornings in Florence*, V, 'The Strait Gate', Vol. 23, p. 394, Ruskin has become more critical of Darwin, 'Darwinism, like all widely popular and widely mischievous fallacies, has many a curious gleam and grain of truth in its tissue.'

In *Guide to the Academy at Venice*, Vol. 24, p. 177 (1877), Ruskin referred to: 'Your very monkey in repose, perfect in its medieval dress; the Darwinian theory in all its sacredness, breadth, divinity, and sagacity.'

The Shrine of the Slaves, Vol. 24, p. 342 mentioned a 'Darwinian Museum' as a future repository of new and extinct species after 'the imaginative arts shall be known no more', a typical Ruskinian literary flourish used to expose what he considered the hubris of Darwin's ideas. He concluded the Appendix to this book (p. 446) by describing 'Darwinian science' as investigating the 'manners practised among apes as those of supreme Courtesy.'

In *Love's Meinie* (1873) Ruskin again took the opportunity, when discussing the feathers of the robin, to mock Darwin's ideas.

> In fact, I have no doubt the Darwinian theory on the subject is that the feathers of birds once stuck up all erect, like the bristles of a brush, and have only been blown flat by continual flying.
>
> Nay, we might even sufficiently represent the general manner of conclusion in the Darwinian system by the statement that if you fasten a hair-brush to a mill-wheel, with the handle forward, so as to develop itself into a neck by moving always in the same direction, and within continual hearing of a steam-whistle, after a certain number of revolutions the hair-brush will fall in love with the whistle; they will marry, lay an egg, and the produce will be a nightingale.[19]

Later, on p. 56, Ruskin pointed out the disagreement over the definition of species as evidence for a lack of understanding:

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[18] *ibid*., XXIII, p. 106, 'Val D'Arno'.
[19] *ibid*., XXV, p. 36, 'Love's Meinie'.

> 61. But even in the paltry knowledge we have obtained, what unanimity have we?—what security ? Suppose any man of ordinary sense, knowing the value of time, and the relative importance of subjects of thought, and that the whole scientific world was agog concerning the origin of species, desired to know first of all—what was meant by a species.
>
> He would naturally look for the definition of species first among the higher animals, and expect it to be best defined in those which were best known. And being referred for satisfaction to the 226th page of the first volume of Mr. Darwin's Descent of Man, he would find this passage :-
>
> "Man has been studied more carefully than any other organic being, and yet there is the greatest possible diversity among capable judges, whether he should be classed as a single species or race, or as two (Virey), as three (Jacquinot), as four (Kant), five (Blumenbach), six (Buffon), seven (Hunter), eight (Agassiz), eleven (Pickering), fifteen (Borg St. Vincent), sixteen (Desmoulins,) twenty-two (Morton), sixty (Crawford), or as sixty-three according to Burke."
>
> And in the meantime, while your men of science are thus vacillating, in the definition of the species of the only animal they have the opportunity of studying inside and out, between one and sixty-three; and disputing about the origin, in past ages, of what they cannot define in the present ones[20]

Later again, on p. 154, when describing the Chough he points out the difference between the red-legged crow and the red-legged gull but associates the Greek's confusion of the two birds with a sloppy 'Darwinian' approach to species.

In *Proserpina, Vol. I* when describing the root he refers positively to Darwin's discovery that some flowers resemble insects and depend on insects for their existence (Vol. 25, p. 224). However, forty-four pages later he is describing Darwin as semi-educated.

> All these materialisms, in their unclean stupidity, are essentially the work of human bats; men of semi-faculty or semi-education, who are more or less incapable of so much as seeing, much less thinking about, colour ; among whom, for one-sided intensity, even Mr. Darwin must be often ranked, as in his vespertilian treatise on the ocelli of the Argus pheasant which he imagines to be artistically gradated, and perfectly imitative of a ball and socket. If I had him here in Oxford for a week, and could force him to try to copy a feather by Bewick, or to draw for himself a boy's thumbed marble, his notions of feathers, and balls, would be changed for all the rest of his life. But his ignorance of good art is no excuse for the acutely illogical simplicity of the rest of his talk of colour in the Descent of Man. Peacocks' tails, he thinks, are the result of the admiration of blue tails in the minds of well-bred peahens,—and similarly, mandrills' noses the result of the admiration of blue noses in well-bred baboons. But it never occurs to him to ask why the admiration of blue noses is healthy in baboons, so that it develops their race properly, while similar maidenly admiration either of blue noses or red noses in men would be improper, and develop the, race improperly. The word itself "proper" being one of which he has never asked, or guessed, the meaning. And when he imagined the gradation of the cloudings in feathers to represent successive generation, it never occurred to him to look at the much finer cloudy gradations in the clouds of dawn themselves; and explain the modes of sexual preference and selective development which had brought them to their scarlet glory, before the cock could crow thrice.[21]

Ruskin's description of myth in *Deucalion Vol. I* (Vol. 26, pp. 98-99) showed the contempt with which he regarded Darwin's theory:

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[20] *ibid*., p. 56, 'Love's Meinie'.
[21] *ibid*., p. 224, 'Proserpina 1'.

> Proserpina and Deucalion are at least as true as Eve or Noah; and all four together incomparably truer than the Darwinian Theory. And in general, the reader may take it for a first principle, both in science and literature, that the feeblest myth is better than the strongest theory: the one recording a natural impression on the imaginations of great men, and of unpretending multitudes; the other, an unnatural exertion of the wits of little men, and half-wits of impertinent multitudes.[22]

This view is reinforced later (Vol. 26, p. 336) when he added that allegorical fables are '"incomparably truer" than the Darwinian—or, I will add any other materialistic theory'.

In *Fors Clavigera* he referred disparagingly to 'cooled (according to the Darwinian theory) with baboons blood' (Vol. 27, pp. 130-131), 'unredeemable by any Darwinism' (Vol. 27, p. 182) and 'Mr. Darwin's germ-cells' (Vol. 27, p. 380) and later 'The baboons in Regent's park—with Mr. Darwin's pardon—*are* of another species; a less passive, and infinitely wittier one' (Vol. 27, p. 531). He continued with various asides, such as 'other idols of genesis enthroned in Mr. Darwin's and Mr. Huxley's shrines' (Vol. 27, p. 657) and 'Does not Mr. Darwin show that you can't wash the slugs out of a lettuce without disrespect to your ancestors?' (Vol. 28, p. 154). He continues with various other minor jocular references to Darwin, such as 'you must not be an ape yourself, whatever Mr. Darwin may say' (Vol. 28, p. 466).

In 'Arrows of the Chace' (Vol. 34, p. 586) Ruskin dismissed a number of writers including John Stuart Mill, Charles Kingsley, Gibbon and Voltaire and has this to say about Darwin:

> 5. Darwin.—Because it is every man's duty to know what lie is, and not to think of the embryo he was, nor the skeleton that he shall be. Because, also, Darwin has a mortal fascination for all vainly curious and idly speculative persons, and has collected, in the train of him, every impudent imbecility in Europe, like a dim comet wagging its useless tail of phosphorescent nothing across the steadfast stars.[23]

In a letter to the editor of the *Pall Mall Gazette*, 24 May 1886 (Vol. 34, p. 596) Ruskin wrote,

> SIR,—If you think your readers would really care to know " what Mr. Ruskin will say" of Herr Paul von Ritter's legacy to Jena, announced in your issue of the 21st—he says that the Herr is twice a simpleton—first for his faith in Darwin—and secondly for his faith in the University of Jena, or any other, teaching anything nowadays but what the public want of it.
>
> I take the chance you give me of adding this farther word to what I before said of Darwin's theory. It is mischievous, not only in looking to the past germ instead of the present creature,—but looking also in the creature itself—to the Growth of the Flesh instead of the Breath of the Spirit. The loss of mere happiness, in such modes of thought, is incalculable. When I see a girl dance, I thank Heaven that made her cheerful as well as graceful; and envy neither the science nor sentiment

[22] *ibid*., XXVI, pp. 98-99, 'Deucalion 1'.
[23] *ibid*., XXXIV, p. 586, 'Arrows of the Chace'.

> of my Darwinian friend, who sees in her only a cross between a Dodo and a Daddy-long-legs.[24]

In a letter to Dawtrey Drewitt, 12 September 1874, (Vol. 37, p. 140) Ruskin in another joking comment regarding Darwinism inadvertently made an accurate comment regarding sparrows and brown moths,

> My Dear Drewitt,—I got your happy letter to-day, but am a little provoked with you for talking nonsense about Darwinism, even in play. Of course you might just as well say that grass was green because the cows selected the flowers, or that moths were brown because sparrows catch the conspicuous ones. Nature shows and conceals exactly as she chooses. It is true that we have only sparrows because we shoot the kingfishers ; but God makes gentians gay and lichens grave as it pleases Him, and by no other law, no other reason. Do you suppose a gnat escapes a trout because it is grey, and that dragon-flies are blue because salmon like red ones—if they do ! [25]

Finally, in a letter dated August 1879 from Ruskin to Sir Charles Litchfield he indicated he may have had a different opinion of Darwin (Vol. 38, p. 334).

> Mrs. Litchfield explains that she and her husband were staying with Mr. and Mrs. Darwin at the Waterhead Hotel, Coniston. 'One day we rowed across the lake to see Mr. Ruskin and set off back again at the beginning of a thunderstorm. This grieved his courteous nature and he wrote the following letters, and sent me, as a sort of peace offering, a minute, exquisitely finished painting of one barb of a peacock's feather magnified. Ruskin was charming in his intercourse with my father, at first calling him 'Sir Charles,' and showing a delicate courtesy and respect.'
>
> Dear Litchfield,—It has indeed been a great pleasure to me to be brought into some nearer and kinder relations with Mr. Darwin; but you must not think I did not before recognize in him all that you speak of so affectionately. There is no word in any of my books of disrespect towards him, though I profoundly regret that the very simplicity and humility of his character prevents his separating what of accurately observed truth he has taught us from the wild and impious foolishness of the popular views of our day.[26]

James McNeill Whistler's Ten O'clock Lecture

The following are the specific parts of the lecture that discuss beauty.

> […] Art has been maligned. She has naught in common with such practices. She is a goddess of dainty thought--reticent of habit, abjuring all obtrusiveness, purposing in no way to better others.
>
> She is, withal, selfishly occupied with her own perfection only—having no desire to teach—seeking and finding the beautiful in all conditions and in all times, as did her high priest Rembrandt, when he saw picturesque grandeur and noble dignity in the Jews' quarter of Amsterdam, and lamented not that its inhabitants were not Greeks.
>
> As did Tintoret and Paul Veronese, among the Venetians, while not halting to change the brocaded silks for the classic draperies of Athens.
>
> As did, at the court of Philip, Velasquez, whose Infantas, clad in inaesthetic hoops, are, as works of Art, of the same quality as the Elgin marbles.

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24 *ibid*., p. 596.
25 *ibid*., XXXVII, p. 140.
26 *ibid*., XXXVIII, p. 334.

No reformers were these great men—no improvers of the way of others! Their productions alone were their occupation, and, filled with the poetry of their science, they required not to alter their surroundings—for, as the laws of their Art were revealed to them they saw, in the development of their work, that real beauty which, to them, was as much a matter of certainty and triumph as is to the astronomer the verification of the result, foreseen with the light given to him alone. In all this, their world was completely severed from that of their fellow-creatures with whom sentiment is mistaken for poetry; and for whom there is no perfect work that shall not be explained by the benefit conferred upon themselves.

Humanity takes the place of Art, and God's creations are excused by their usefulness. Beauty is confounded with virtue, and, before a work of Art, it is asked: "What good shall it do?"

Hence it is that nobility of action, in this life, is hopelessly linked with the merit of the work that portrays it; and thus the people have acquired the habit of looking, as who should say, not at a picture, but through it, at some human fact, that shall, or shall not, from a social point of view, better their mental or moral state. So we have come to hear of the painting that elevates, and of the duty of the painter—of the picture that is full of thought, and of the panel that merely decorates. […]

This man, who took no joy in the ways of his brethren--who cared not for conquest, and fretted in the field--this designer of quaint patterns--this deviser of the beautiful—who perceived in Nature about him curious curvings, as faces are seen in the fire—this dreamer apart, was the first artist. […]

Nature contains the elements of color and form of all pictures – as the keyboard contains the notes of all music –

but the artist is born to pick, and choose, and group with science, these elements, that the result may be beautiful – as the musician gathers his notes, and forms his chords, until he brings forth from chaos, glorious harmony. –

To say to the painter, that nature is to be taken, as she is, is to say to the player, that he may sit on the piano! –

That Nature is always right, is an assertion, artistically, as untrue, as it is one whose truth is universally taken for granted – Nature is very rarely right, to such an extent even, that it might almost be said that Nature is usually wrong – that is to say – the condition of things that shall bring about the perfection of harmony worthy a picture, is rare, and not common at all –

This would seem, to even the most intelligent, a doctrine almost blasphemous – So incorporated with our education has the supposed aphorism become, that its belief is held to be part of our moral being – and the words themselves have, in our ear, the ring of religion! – Still, seldom does nature succeed in producing a picture – –

The sun blares – and the wind blows from the East – the sky is bereft of cloud – and without, all is made of iron – The windows of the Crystal Palace are seen from all points of London – the holiday maker rejoices in the glorious day – and the painter turns aside to shut his eyes –

How little this is understood, and how dutifully the casual in Nature, is accepted as sublime, may be gathered from the unlimited admiration, daily produced, by a very foolish sunset – […]

Set apart by them to complete their works, he produces that wondrous thing called the masterpiece, which surpasses in perfection all that they have contrived in what is called Nature; and the Gods stand by and marvel, and perceive how far away more beautiful is the Venus of Melos than was their own Eve. […]

We have then but to wait--until, with the mark of the Gods upon him—there come among us again the chosen--who shall continue what has gone before. Satisfied that, even were he never to appear, the story of the beautiful is already complete—hewn in the marbles of the Parthenon--and broidered, wlth the birds, upon the fan of Hokusai—at the foot of Fusiyama.

Appendix 3: A Brief History of Beauty

This Appendix is a summary of the story and theory of sexual selection. The following were used as the primary sources together with the other books and articles mentioned in the bibliography—Helena Cronin, *The Ant and the Peacock : Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991), Matt Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (London: Penguin, 1994), Geoffrey Miller, *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (London: Vintage, 2001), Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 2006) and Richard Dawkins, *The Blind Watchmaker* (Harlow: Longman, 1986).[1]

In order to put the theory in context there is a brief description of the history of theories of evolution, natural selection and the genetic basis for evolution. The aim is to provide a brief background to the science for non-scientists. A great deal has been discovered since the nineteenth century both theoretically, through mathematically modelling, and through experiments but sexual selection is still a controversial subject and the aim has been to present the consensus view rather than the detail of the current debates. The emphasis is on sexual selection and beauty and so a number of areas have been skimmed over or omitted and some recent research involving beauty and brain scans has been included even though it is not specifically concerned with sexual selection.

Sexual selection was one of Darwin's greatest and most original ideas yet it was ignored or dismissed for a hundred years. Many scientists today still appear to be motivated to try to explain sexual selection using natural selection or to ignore it entirely. Helena Cronin was an important influence as she was a respected scientist, took sexual selection seriously and explained it clearly. I start by looking at what the idea is, which first involves being sidetracked into an explanation of natural selection and genetic theory. I then speculate about why it was ignored for a hundred years, with a few exceptions, and finally I give a brief overview of the enormous explosion of research into sexual selection and beauty in the last few years.

Darwin and Evolution

Darwin produced a publishable version of his theory of evolution by 1844 but he delayed publishing until 1859 when it was forced on him by a letter he received from Alfred Wallace describing the crux of the process of natural selection. There had been many

[1] Quoted text is referenced but the majority of the text is my own interpretation based on the ideas in the books mentioned and so any errors are mine.

theories of evolution but Darwin described the mechanism, called natural selection. Other theories were concerned with the idea of change and progress and either did not describe how it could happen or described a mechanism that lacked credibility. For example, the Ancient Greek philosopher Heraclitus described the continual flux of all experience but it is difficult to relate his fragments with any modern idea of evolution. His famous phrase 'all things are flowing' is believed by Bertrand Russell to be apocryphal, but fragment 98 and 99 do say, 'The wisest man is an ape compared to God, just as the most beautiful ape is ugly compared to man.'[2] Other Pre-Socratics can also be interpreted in modern evolutionary terms, for example Russell writes, in relation to Anaximander, 'The worlds were not created, as in Jewish or Christian theology, but evolved. There was evolution also in the animal kingdom. […] Man, like every other animal, was descended from fishes.'[3]

Darwin was criticized for not referencing earlier work in his first edition of *Origin* and he added 'An Historical Sketch of the Recent Progress of Opinion on the Origin of Species' in the third edition of 1861. In this, he identified the first modern author to treat evolution scientifically as Jean-Baptiste Pierre Antoine de Monet, Chevalier de Lamarck (1744-1829). He skipped over Georges-Louis Leclerc, Comte de Buffon (1707-1788) as he said he was not familiar with his writings. Buffon in *Histoire Naturelle, Générale et Particulière* (1749–1778, 36 volumes) suggested that species must have both 'improved' and 'degenerated' after dispersing away from a centre of creation, an idea later known as Buffon's Law. However, Buffon believed that environmental factors could give rise to what we would call new races but not to new species. Darwin describes Lamarck as a 'justly celebrated naturalist'. He was an early proponent of the idea that all species, including man, descended from other species without divine intervention. He was the first to create a unified theory of evolution that embodied the ideas of the period although he is now discredited because he assumed that characteristics acquired during an organism's life could be passed to its offspring. He also believed that organisms could arise through spontaneous generation and that there was a force that caused organisms to progress and improve.

The idea of evolution was discussed throughout the nineteenth century and as early as 1794, Darwin's grandfather, Erasmus Darwin, speculated that all warm-blooded animals might have arisen from 'one living filament'. These early ideas concerning evolution were compatible with the concept of progress and the 'ascent of man'. Man, and in particular white, European man, was regarded as the pinnacle of an evolutionary

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[2] Bertrand Russell, *History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day* (London: George Allen, 1971), p. 63 and John Burnet, *Early Greek Philosophy* (London: Adam & Charles Black, 1971), p. 140

[3] Russell, *History of Western Philosophy* (1971), p. 47

sequence that started with the 'one living filament' and this was often described as the 'great chain of being'.[4] This concept of progress allowed ideas of evolution to co-exist with religious belief as man could be seen as the pinnacle of God's plan and many speculated about how God had directed evolution.

In 1837, Lyell in his *Principles of Geology* wrote: 'the testacea [with ciliate, the plankton] of the ocean existed first, until some of them by gradual evolution, were *improved* into those inhabiting the land.'[5] Lyell foresaw that gradual, incremental improvements over a long period could bring enormous changes. This idea was opposed to the belief, based on religious ideas of the Flood, that sudden catastrophic changes gave rise to the death of certain species and the creation of new species.[6] Geology provided the evidence for a sufficiently long period for gradual, incremental evolutionary change to have taken place. This gave rise to a major problem as the age of the earth calculated by physicists was not long enough for evolution or many geological events to have taken place. This plagued Darwinists and was not resolved until the discovery of nuclear processes, which also explained how the sun could continue 'burning' for millions of years. As late as 1897 William Thomson (Lord Kelvin) was arguing that 'the best available' age for the sun, and therefore the earth was no more than 24 million years.[7]

Of all the books published on evolution, including Darwin's, the most popular was *Vestiges of the Natural History of Creation* published in 1844 by an unknown author whose name was only revealed as Robert Chambers in 1884, thirteen years after his death.[8] It acknowledged Lamarck's work but dismissed his mechanism, 'Early in this century, M. Lamarck, a naturalist of the highest character, suggested a hypothesis of organic progress which deservedly incurred much ridicule, although it contained a glimmer of the truth.'[9] *Vestiges* put forward a grand theory of evolution that stated that the most complex forms developed from the most primitive through a law of progress. It started by describing the origins of the solar system followed by the origins of live through spontaneous generation brought about by the action of electricity. It then described the evolution of life from simple to complex forms referencing the fossil record and culminating with Western European man as the pinnacle. Its importance as a contribution

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4 'Man, and generations of men, are not links broken off from the great chain of being', William Godwin, 'History of the Commonwealth of England', *Westminster Review,* 8 (April-July, 1827), 328-51 (p. 340).

5 Lyell, *Principles of Geology: Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes Now in Operation*, 2nd edn (1833), p. 11, Vol. 2.

6 'An additional period of a century and a half was now destined to be consumed in exploding this hypothesis, that organized fossils had all been buried in the solid strata by the Noachian flood.', *ibid*., p. 34, Vol. 1.

7 *William Morris on Art and Socialism*, ed. by Kelvin, p. 43. Thomson argued as early as 1864 that the Earth's age was between 20 and 400 million years and only 'a moderate number of millions of years ago' it was a red-hot globe

8 Chambers, *Vestiges*, 1st edn (1844).

9 *ibid*., p. 230.

was as a stepping-stone to Darwin's theory. *Vestiges* argued that Divine intervention to create every species 'greatly detracts from his foresight' and it was more worthy to suppose that the Deity created a system of laws that would itself produce the whole universe and all the species. *Vestiges* was very popular and did create a debate about the idea of the natural evolution of species without divine intervention but it did not provide any mechanism. It stated that the universe started as a single homogeneous mass and that there is a fundamental law of progress that results in gradual differentiation resulting in first stars, then planets, then life and eventually higher mammals.

By 1844, Darwin had written a book describing his theory of natural selection but, apart from persuading his friend Joseph Hooker to read it in 1847, he kept it secret and left instructions for it to be published in the event of his death. He continued with other research work until 1856 when a paper by Alfred Wallace (1823-1913) alerted Charles Lyell to the possibility of Darwin's idea being pre-empted. He encouraged Darwin to publish his ideas but Darwin was overworked and could not decide whether to update his book into a major work or publish it without all the new evidence he had acquired. This uncertainty was cut short when on 18 June 1858 he received a twenty-page letter from Wallace describing essentially the same evolutionary mechanism. With Lyell and Hooker's encouragement, this resulted in a joint paper being read at the Linnean Society on 1 July 1858 and the publication of *Origin* on 24 November 1859. As Darwin was already a famous scientist the book was widely reviewed, and its ideas were supported by a growing number of other respected scientists.

Origin included three pages on an alternative process of selection he called sexual selection, which he added in order to explain how beauty could have evolved. In 1871, he expanded these three pages into two-thirds of the book, *The Descent of Man, and Selection in Relation to Sex*. Darwin's ideas concerning sexual selection were dismissed by many critics at the time and were not widely discussed for a hundred years. It was not until the 1970s and 80s that interest started to increase and today it is a popular research area.

Herbert Spencer (1820-1903) is best known for the phrase 'survival of the fittest' that he coined in 1864 in *Principles of Biology* after reading *Origin*.[10] His first clear description of his evolutionary theory was in *Progress: Its Law and Cause* (1857). He believed in a universal law of progress - that all systems develop from simple, undifferentiated homogeneity to complex differentiated heterogeneity and in this he followed but expanded the theory described by Robert Chambers in *Vestiges* (1844).[11] Spencer's optimistic view of continual progress and ever differentiated heterogeneity

[10] Spencer, *The Principles of Biology* (1864).
[11] Chambers, *Vestiges*, 1st edn (1844).

appeared to be contradicted by another great scientific law developed between 1824 and 1865, the second law of thermodynamics.[12] This states that energy is never lost or destroyed only transformed and the process of transformation, apart from local centres of complexity, such as life, involves dissipation, the slow spreading and evening out of energy like a clock running down.[13] More precisely, entropy, which is a measure of randomness, is always increasing, given a large enough system. The counter claim that life breaks the second law of thermodynamics fails to consider the enormous energy flow from the sun that powers life on earth.

The other precursors to Darwin theory of natural selection that have often been discussed are Edward Blyth (1810-1873) who saw natural selection as a negative force that prevented individuals from deviating from God's original design. Patrick Matthew (1790-1874) who wrote an Appendix to a paper on naval timbers published in 1831 in which he mentioned natural selection as a mechanism that could result in indefinite variation and the formation of new species. He later claimed that the idea seemed so obvious to him that he did not make more of the discovery and was surprised by the publicity that Darwin's idea received. Dawkins view is that this failure to realise the significance of his idea rules him out as a true discoverer.[14] William Charles Wells arrived at a form of natural selection in humans in 1813 but he did not pursue the idea further. Finally, Wallace has a genuine claim as he was in no doubt of the immense importance of the idea. However, Darwin worked out the mechanism for evolutionary change at least sixteen if not twenty years before Wallace.

There are no precursors to Darwin's theory of sexual selection and even his most faithful supporters had problems accepting all the implications. Wallace, for example, tried to explain all the sexually selected traits as resulting from natural selective forces, such as camouflage and even a side-effect of 'male vigour'.

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[12] It is difficult to give a precise date as the theory developed from theories of heat transformation first stated by Nicolas Carnot in 1824, but by 1850, Rudolf Clausius had formulated the first statement of what we now call the second law of thermodynamics and by 1865 had defined entropy. William Thomson also popularised the idea in the early 1850s when he wrote about the 'heat death of the universe'.

[13] The mass-energy equivalence relationship ($e=mc^2$) was not realised until Albert Einstein's publication of the special theory of relativity in 1905. An obvious consequence of the second law is that if entropy is increasing the universe must have started in a very ordered state and this seems to conflict with the idea of a big bang. The correctness and implications of this view are one of the central puzzles of cosmology.

[14] Darwin acknowledged his contribution but a letter from Matthew to Darwin on 12 March 1871 showed that he had only a vague understanding of scientific ideas. He wrote about how 'there exists high design & constructive power' in nature, about how the sun radiated the 'spark of life' and that beauty could not be accounted for by natural selection but instead there was a 'sentiment of beauty pervading nature'.

Natural Selection

Darwin's principle mechanism for change was natural selection, which describes the gradual proliferation of those traits that result in more offspring. Natural selection is best explained by Darwin:

> As many more individuals of each species are born than can possibly survive; and as, consequently, there is a frequently recurring struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be naturally selected. From the strong principle of inheritance, any selected variety will tend to propagate its new and modified form.[15]

This is typically broken down into four components, each of which can be tested:

1. The individuals of each species vary, as we can see by looking at other humans.
2. Some of these variations are passed on to their offspring. That is, offspring inherit particular traits from their parents.
3. More offspring are produced than survive. In some species, thousands or even millions of offspring are produced but only a few survive.
4. Those that survive and reproduce have inherited variations that give them an advantage. For example, the faster are more likely to escape predators.

Darwin believed natural selection could not account for all the traits found in nature and the most common example quoted is the peacock's tail. The peahen appears to be an efficient machine compared to the flamboyant peacock whose tail is expensive to produce and makes it owner more likely to be caught by predators. Darwin's solution was sexual selection; the peahen selected and would only mate with the peacock with the most beautiful tail and so over many generations peacocks developed more and more impressive tails. Darwin also described another form of sexual selection that involved potential mates fighting using weapons, such as antlers and horns, in battles that decided who would mate.

Darwin realised that although natural selection appeared progressive and successive life forms often looked as if they were gaining complexity the only driving force was fitness to survive and this could result in what appears to us to be degeneration. Darwin's ideas do not imply improvement and humans could be a transient phenomenon in the history of life on earth. These implications were not always clear in the popularization of Darwin's ideas but they provided a dark, atavistic backdrop that led

[15] Darwin, *Origin*, 1st edn (1859), p. 5.

‘deeper and deeper into the heart of darkness.’[16] Other important writers and popularisers after Darwin were Huxley and Wallace and in Germany Albert Weismann.

Modern Evolutionary Synthesis

Gregor Mendel (1822-1884) published his work on the hybridization of peas in 1866. He described two general laws, the law of segregation and the law of independent assortment. The first law states that every individual has two inheritable copies of each trait and some are dominant and some recessive. The trait is expressed if either one or both of the dominant versions are present. His second law states that one copy of each trait is randomly selected and passed on to its offspring independently of all the other traits.

Although his work was overlooked at the time it was rediscovered in the early 1900s when scientists were searching for a theory of discontinuous inheritance to replace the theory of blending inheritance that had been assumed up to that time. Blending inheritance had been shown by Fleeming Jenkin to undermine Darwin’s theory of natural selection as new variations would simply fade away over many generations as they were blended out.[17] Coincidentally, the same year that Mendel published his work on peas Darwin wrote to Wallace about his pea experiments saying ‘I crossed the Painted Lady and Purple sweetpeas, which are very differently coloured varieties, and got, even out of the same pod, both varieties perfect but not intermediate.’[18] However, Darwin never realised the significance or worked out the mechanism.

In the early 1900s, following the discovery of Mendel’s work it was thought that this replaced Darwin’s theory, which was discredited or ignored by many. In 1918, R. A. Fisher published the first paper concerning population genetics, a mathematical description of how populations evolve over time. He showed that Mendelian genetics was completely consistent with evolution driven by natural selection. During the 1930s and 1940s a great deal of work on genetics was conducted in Russia and Germany but the gene –centred view of evolution and what became known as the modern evolutionary

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16 Joseph Conrad, *Heart of Darkness* (London: Penguin Books, 1994, first published 1902), p. 50.

17 A major problem for Darwin was that it was thought that inheritance involved ‘blending’ the variations of the parents to produce the offspring, a mechanism that tended to remove variations. Some consider it was Henry Charles Fleeming Jenkin’s (1833-1885) attack on Darwin in 1867 that led to him starting to introduce the once rejected Lamarckian mechanism into later editions of *Origin*, see Peter Vorzimmer, 'Charles Darwin and Blending Inheritance', *Isis,* 54:3 (September, 1963), 371-90. Darwin, of course, mentions the obvious counter example to blending, the fact that every generation consists of either male or female members, with very few intermediate forms

18 Gregor Johann Mendel, 'Experiments on Plant Hybridization', *Proceedings of the Natural History Society of Brünn* (1866). Darwin letter to A. R. Wallace, ‘Sweet Pea Crossing’, Down, [6 February 1866].

synthesis was not put together until the 1960s. This work was popularised by Richard Dawkins in 1976 with the publication of *The Selfish Gene*.

In parallel, the chemical basis of genetics had been worked out. As early as 1869 deoxyribonucleic acid (DNA) had been isolated and later, it was known to consist of five nucleobases strung together. By the 1920s, it was speculated that traits were inherited by a giant molecule that contained two mirror strands and DNA was one of the candidates. However, it was not until 1953 that James Watson and Francis Crick proposed a double-helix model for the structure of DNA based on a single X-ray diffraction image taken by Rosalind Franklin and Raymond Gosling in 1952.

It is now known that information is coded as non-overlapping triplets of bases called codons. As there are four bases this gives sixty-four possible meanings for each codon. There is some redundancy (confusingly called degeneracy) so there are only about twenty different meanings plus start and stop codes. The meaning of each codon is a particular amino acid and a sequence of amino acids creates a protein. A sequence of codons that codes for a protein is called a gene.[19] Every human has about 20,000-25,000 genes divided into twenty-three pairs of chromosomes of which one differs between men and women, the so-called Y-chromosome.

The DNA code is best thought of as a recipe rather than a computer program. Decoding is more like cooking than running a program as it creates a chemical brew that once initiated starts to run itself. This also means that a small change to the genes of an individual (the genotype) can result in major changes to the form and lifestyle of the individual (the phenotype). If a random change is made to a computer program then typically the complete program crashes. This model would suggest that most mutations would be catastrophic and result in death. However, a change to a recipe often results in a different but still tasty dish.

Modern genetics is a large, fast moving field of science with many cross-disciplinary research areas being explored. Controversial areas include group selection, altruism, punctuated equilibrium, epigenetics and horizontal gene transfer. Sexual selection was a controversial area but has now entered the mainstream of research. However, it is still rarely mentioned in many popular books that explain genetics and evolutionary theory. Dawkins describes it as ‘Darwin’s beautiful theory of sexual selection’ but it is still often omitted when describing Darwin’s achievements.[20]

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[19] This description is simplified as some viruses use a code based on single stranded ribonucleic acid (RNA). In addition, the exact mechanism of DNA transcription will not be described.

[20] Dawkins and Wong, *The Ancestor's Tale: A Pilgrimage to the Dawn of Evolution* (2005), p. 273.

Sexual Selection and Beauty

Beauty was perhaps the least likely attribute of animals to be explained by a scientific theory of evolution.[21] The vast majority of *Origin* was concerned with explaining and justifying natural selection but Darwin realised that certain features could not be explained and so he introduced the novel idea of sexual selection. He described two types of sexual selection, 'the struggle between males for possession of the female' and selection of a mate based on beauty.[22] On the latter, Darwin wrote: 'I can see no good reason to doubt that female birds, by selecting, during thousands of generations, the most melodious or beautiful males, according to their standard of beauty, might produce a marked effect.'[23] With these words he introduced a topic that was so contentious that even his co-discoverer of natural selection, Wallace, disagreed and most geneticists ignored the topic for a hundred years.

Darwin's opponents regarded beauty as a vulnerable area of his theory that was open to attack, as although he was a respected biologist he knew little about art, art theory or artistic practice. His opponents, such as John Ruskin and the Duke of Argyll used the existence of beauty as *de facto* proof that plants and animals were created by God. Natural selection as Darwin defined it did not explain how beauty came into existence, as it does not appear to help the organism. In fact, bright colours and unwieldy ornaments make it harder for an organism to survive and they can therefore be used as an argument against natural selection. Between the publication of *Origin* in 1859 and *Descent* in 1871, Darwin developed a complete theory of sexual selection that addressed this attack. For Darwin, beauty became crucial to the survival of certain plants and animals, those that must attract a pollinator, propagator or mate.[24] However, his opponents saw this as an admission of the inability of his main theory to explain beauty and therefore they believed that beauty was important evidence against Darwin's ideas.

Even Darwin's supporters could not accept that sexual selection could result in male ornaments, particularly as a result a female selection. Wallace put forward an alternative theory to explain male ornaments, he believed they were the result of an excess of male vitality and if such males were preferentially selected by females it was because such males were fitter. In other words, he found an explanation involving either

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21 Darwin applied the term sexual selection only to animals although recently there has been an attempt to apply it to plants, see Verne Grant, 'Sexual Selection in Plants: Pros and Cons', *Proceedings of the National Academy of Sciences of the United States of America,* 92 (February, 1995), 1247-50.

22 Darwin, *Origin*, 1st edn (1859), p. 88.

23 *ibid*., p. 89.

24 Beauty in plants is not an example of sexual selection but of natural selection, as Darwin pointed out the only plants that are brightly coloured are those that use animals for pollination or to propagate their seeds.

a non-biological explanation or natural selection. By non-biological he meant that certain colours, such as red blood are the result of their chemical constituents and no biological explanation is necessary. Wallace explained the drab colour of female animals as resulting from natural selection replacing their naturally bright colours in order to help them hide while incubating and feeding their young.

Darwin introduced the idea of sexual selection in *Origin* where he gives a brief but precise description:

> [...] a great number of male animals, as all our most gorgeous birds, some fishes, reptiles, and mammals, and a host of magnificently coloured butterflies, have been rendered beautiful for beauty's sake; but this has been effected through sexual selection, that is, by the more beautiful males having been continually preferred by the females, and not for the delight of man.[25]

Darwin makes two profound points—beauty is not a signal for something else, such as health or disease resistance, it is an end in itself, and beauty is the result of an interaction between males and females over many generations, it is not a divine attribute. Sexual selection is also distinct from natural selection and it was described by Darwin in this manner:

> This [sexual selection] depends, not on a struggle for existence, but on a struggle between the males for possession of the females; the result is not death to the unsuccessful competitor, but few or no offspring. Sexual selection is, therefore, less rigorous than natural selection.[26]

Natural selection is often assumed to be the primary driving force of evolutionary change but sexual selection can drive change faster as it involves positive feedback.[27] There are two types of sexual selection most succinctly described by Darwin:

> The sexual struggle is of two kinds: in the one it is between the individuals of the same sex, generally the males, in order to drive away or kill their rivals, the females remaining passive; while in the other, the struggle is likewise between the individuals of the same sex, in order to excite or charm those of the opposite sex, generally the females, which no longer remain passive, but select the more agreeable partners.[28]

Darwin observed that peahens would select those peacocks with the largest and brightest display of feathers.[29] Peacocks with the most beautiful feathers will have the most

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[25] Darwin, *Origin*, 6th edn (1872), p. 161.

[26] Darwin, *Origin*, 1st edn (1859), p. 88.

[27] Positive feedback is a term used to describe any system where a change to one part results in an increased change to that part. The system will be unstable and likely to undergo explosive change to any tiny perturbation. The idea of sexual selection involving a simultaneous and connected change to female preference and male trait was first proposed by Ronald Fisher in 1930 and mathematically verified by Russell Lande in the early 1980s. See Andersson, *Sexual Selection* (1994), pp. 32,39-41. While natural selection can take tens of thousands of generations to bring about a change, sexual selection takes only a few hundred.

[28] Darwin, *Descent*, 2nd, 15th thousand edn (1882), p. 614.

[29] Peacocks are one of the few birds that 'run a kind of market in seduction techniques, called a lek', see Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (1994), pp. 136-37.

offspring and the next generation will therefore have a higher proportion of peacocks with beautiful tails and peahens more likely to choose them.[30]

A feature of ornaments is that they can be anything at all; in other words, beauty arises from the smallest discrimination blown up to an extreme form in a short period.[31] As one example, an alien might find the most surprising feature of humans is our lack of body hair compared with other species of great ape.[32] Such features can arise through a tiny but widely held preference that undergoes explosive evolution both in the trait itself and in the preference for the trait, which go hand in hand.

I have intentionally been using the term 'beautiful' as it is the word used by Darwin and he makes it clear that he intends it to have all the associations of human sexual selection, such as pleasure, desire, conscious choice and free will. Darwin went to great lengths in all his writing to show that we are all animals and that there is no attribute of humans, including our aesthetic sense, that is not found in some form in other animals. Much of his writing is explained today as being anthropomorphic as if this were some Victorian foible that can be ignored.[33] But his attribution of, for example, an aesthetic sense, the ability to make fine discriminations and conscious decisions to birds and even to some extent reptiles and insects went to the heart of his deep understanding of the implications of his theory. If we all evolved from common ancestors then you would expect that there would be no trait that could not be found at least in rudimentary form in other animals. Darwin was not being anthropomorphic but zoomorphic—viewing human behaviour in terms of the behaviour of animals.

He also struggled with the gender issue as it relates to beauty. In most animals, both weapons and ornaments are features of the male. This is a consequence of what is now known as the Bateman principle, that as females almost always invest more resources into producing and rearing offspring it is females that are the limiting resource

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30 Fischer was the first to claim that this results in a positive feedback loop and an exponential increase in the selected feature, which therefore spreads through the population extremely rapidly.

31 As Dawkins writes: 'Sexual selection […] predicts sudden evolutionary spurts in arbitrary directions.' Dawkins and Wong, *The Ancestor's Tale: A Pilgrimage to the Dawn of Evolution* (2005), p. 273.

32 Hominids or great apes is a taxonomic family that includes four extant genera, chimpanzees, gorillas, humans and orang-utans. There are other theories, mentioned earlier, about why we lost our body hair that do not require sexual selection.

33 For a full discussion see 'Chapter 2: Fit and misfitting: anthropomorphism and the natural order' in Beer, *Darwin's Plots*, 3rd edn (2009), pp. 44-70. Some writers, such as Karl Marx, thought that Darwin's imposition of human attributes on the animal kingdom was part of his more general imposition of Victorian social norms on the animal world, see *ibid*., pp. 51-53.

over which the other sex will compete.[34] Darwin maintained that in humans it is generally the male that selects the female but he wrote: 'in civilised nations women have free or almost free choice.'[35]

There are three assumptions behind Darwin's theories of both natural and sexual selection. The first is that in a population individuals vary albeit only slightly; second, the only characteristics that Darwinian selection will alter are those that have some correlation with the number of fertile offspring produced, and third that the characteristics of the offspring have some correlation with those of their parents.[36] Darwin had no knowledge of the precise mechanism whereby variations might arise and be passed on and proposed a theory he called pangenesis which later proved to be wrong.[37] Sexual and natural selection differ fundamentally. Natural selection simply describes what follows from these assumptions and the selection is, in a sense done by the environment. It is the few that live to have offspring that pass on their particular variations.

Sexual selection is different because, as Darwin described it, the selection is a conscious choice. It can be argued that except in humans the choice is instinctual and cannot be varied through nurture but in humans, there is a complex interaction with culture. Humans make a conscious choice that can be based on what has been learned during an individual's lifetime and in this sense, sexual selection is like Lamarckian evolution. For example, if a fashion develops for women with large posteriors and such women consistently have more children over many generations then the female population will be born with larger posteriors, if no other factors are involved. This sounds like heresy but is the consequence of conscious choice and should be of no surprise as it is like breeding any animal. This means that culture and the fashion industry are part of a selective breeding programme that can change the population if consistently maintained over a long enough period.

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34 See Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (1994), Baker, *Sperm Wars: Infidelity, Sexual Conflict and Other Bedroom Battles* (1996), and A. J. Bateman, 'Intra-Sexual Selection in Drosophila', *Heredity,* 2 (1948), 349-68. Bateman did all of his research with fruit flies.

35 The full quotation is from Darwin, *Descent*, 1st edn (1871), II, pp. 355-56, see page 77.

36 This is a nineteenth-century description based on observable characteristics (phenotypes); a modern biologist would consider the change in the gene population (as represented by the set of genotypes of every individual in the population).

37 Pangenesis was first described in Darwin, *Variation*, 1st edn (1868), I. Darwin's theory was that cells shed gemmules, which collect in the reproductive organs prior to fertilization.

Other Types of Beauty

As well as beauty resulting from sexual selection, Darwin recognized the beauty we see in symmetry and repetition.

> Again there is beauty in rhythm & symmetry, of forms — the beauty of some as Norfolk Isd fir shows this, or sea weed, &c &c — this gives beauty to a single tree, — & the leaves of the foreground either owe their beauty to absolute forms or to the repetition of similar forms as in angular leaves [38]

For other types of beauty, such as the beauty of landscape, Darwin referred to cultural and learned beauty but in his Notebook M he wrote:

> some forms seem instinctively beautiful as round, ovals; — then there the pleasure of perspective, which cannot be doubted if we look at buildings, even ugly ones. — the pleasure from perspective is derived in a river from seeing how the serpentine lines narrow in the distance. — & even on paper two waving perfectly parallel lines are elegant.[39]

He gives examples of beauty such a narrowing serpentine line but he does not give an evolutionary explanation.[40] Darwin was also aware that there are many more refined types of beauty that depend on complex associations, he wrote:

> Obviously no animal would be capable of admiring such scenes as the heavens at night, a beautiful landscape, or refined music; but such high tastes, depending as they do on culture and complex associations, are not enjoyed by barbarians or by uneducated persons.[41]

Misunderstandings Associated with Darwin's Theory

There are four areas of common misunderstanding and conflict associated with Darwin's ideas applied to beauty and these are connected with progress, fitness, species and sex. They were a source of misunderstanding in Darwin's day and still often cause trouble in lay interpretations today.

The first is the assumption that evolution is concerned with progress or the opposite, degeneration. This assumption of progress lies at the heart of the use of evolution to reinforce class and racial distinctions. Progress implies a hierarchy where some are better fitted or, in some vague sense, more highly evolved. The assumption of progress reinforced many Victorian cultural assumptions, such as the pre-eminence of the English through divine selection, the superiority of the male, and the availability of animals for human exploitation. Progress was associated with the eighteenth-century idea of the great chain of being, a concept that was often pictured with God at the top

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38 Darwin, *Notebook M*, p. 38.
39 *ibid*., p. 37.
40 It is possible that he is referring to Hogarth's line of beauty, see Hogarth, *The Analysis of Beauty Written with a View of Fixing the Fluctuating Ideas of Taste* (1772, first published 1753).
41 Darwin, *Descent*, 1st edn (1871), I, p. 64.

with angels below, followed by the world of humans, other animals, plants and minerals.[42] This hierarchy was the basis of the *Sytema Naturae* of Carl Linnaeus in which he categorized the natural world into kingdoms, classes, orders, genera and species based on shared physical characteristics.[43] Although Darwin's theory was seen as reinforcing the idea of progress and later justifying concerns about degeneration, biologists now understand that evolution has nothing to do with progress.[44] Species and races do not form a hierarchy; they neither improve nor degenerate, but simply consist of individuals that have more or less offspring, and over many generations, features that result in more offspring will tend to predominate. In other words, Darwin had proposed a theory that undermined all previous hierarchies based on race and class but commentators, including Darwin, did not always understand the significance of the theory which fuelled a debate on race, class, progress and degeneration while simultaneously reinforcing prejudice and undermining it.

The second common misunderstanding is associated with the phrase 'survival of the fittest' which Herbert Spencer first used in his *Principles of Biology* (1864) and which Darwin used as a synonym for natural selection in the fifth edition of *Origin* in 1869.[45] Biologists today almost exclusively use Darwin's term 'natural selection' although this continues to confuse both because of its teleological implications and because it understates the importance of sexual selection. The term 'survival of the fittest' is fraught with problems as it misleadingly implies survival of the strongest, most physically fit or even, in capitalist interpretations, the richest. Taken to its extreme, this view reduces the diversity of humanity to a few attributes that are deemed to be either culturally desirable or undesirable and they can then be used to support a political and social programme that gives power to those deemed desirable and eliminates those deemed undesirable. This was the basis of Galton's ideas concerning eugenics which he developed in 1883

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42 This was related to the earlier 'Ladder to Heaven', which was based on St. Climacus's (*c*. 525-*c*.606) *Scala Paradisi*, a description of thirty steps, corresponding to virtues, that could be taken leading to the highest degree of religious perfection, see Leon Clugnet, *John Climacus, Saint* (The Original Catholic Encyclopedia) <http://oce.catholic.com/index.php?title=John_Climacus%2C_Saint> [accessed 22 August 2012].

43 Carolus Linnaeus, *Systema Naturae* (Upsaliae: Laurentii Salvii, 1756).

44 See, for example, Richard Dawkins, *The Blind Watchmaker* (Harlow: Longman, 1986), p. 178 and more significantly Gould, *Life's Grandeur: The Spread of Excellence from Plato to Darwin* (1996), p. 20 where he writes, 'This book tries to show that progress is, nonetheless, a delusion based on social prejudice and psychological hope'.

45 Spencer, *The Principles of Biology* (1864), pp. 444-45. The full quotation is ''This survival of the fittest, which I have here sought to express in mechanical terms, is that which Mr Darwin has called "natural selection, or the preservation of favoured races in the struggle for life."'

and which had a significant influence worldwide during the first half of the twentieth century, including the forced sterilization of ‘defectives’ in the United States.[46]

It also emphasizes the individual rather than what we now know to be the basic unit of selection, the gene. One consequence was that in the nineteenth-century survival of the fittest was regarded as selfish and solely concerned with the individual. In biological terms, this raised serious issues explaining altruistic behaviour. In the twentieth century, it gave rise to the opposite misunderstanding, which was that altruism could be explained by ‘group selection’. Group selection, that is the selection of attributes that favour the group or species rather than the individual, was put forward overtly or implicitly as the explanation for a wide range of behaviour. It was not until Dawkins popularized what is now regarded as the definitive view, that selection always take place at the level of the gene, that altruism re-emerged as a problem and recent research has shown many ways in which it can evolve, such as kinship selection, reciprocal benefit and Amotz and Avishag Zahavi’s handicap principle.[47] However, group selection has its advocates and David Sloan Wilson and Elliot Sober have proposed a multilevel selection theory in which selection forces operate at many levels from gene to cell, then individual and group.[48] For humans, our culture can be regarded as a separate evolutionary system and gene-culture co-evolution has been proposed by Robert Boyd and Peter J. Richerson.[49]

Darwin developed the theory of sexual selection to explain the many characteristics that detracted from an individual’s fitness. For example, the peacock’s tail makes it more likely it will be caught by predators.[50] Sexual selection, a mechanism that was first proposed by Darwin, was largely ignored by theorists until the 1970s. Even today, many biologists feel they must find the utility of every attribute rather than accept capricious beauty as the explanation. Sexually selected characteristics can make the individuals that possess them less likely to survive. This demonstrates the important

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46 Francis Galton was Darwin’s half-cousin as Erasmus Darwin was their common grandfather. Galton wrote 340 books and papers, coined the term eugenics, created the idea of statistical correlation and regression towards the mean, introduced the use of questionnaires and surveys, developed a method for classifying fingerprints, produced the first weather map and invented the Galton whistle among many other things.

47 Dawkins, *The Selfish Gene* (2006), first published in 1976. Altruism is explained by benefiting your genes in your relations (kinship selection), by benefiting through doing favours that are repaid (the reciprocal benefit) and to demonstrate fitness and health despite the handicap of helping others (the handicap principle).

48 D. S. Wilson and E Sober, 'Reintroducing Group Selection to the Human Behavioral Sciences', *Behavioral and Brain Sciences,* 17:4 (1994), 585-654.

49 R. Boyd and P. J. Richerson, 'Culture and the Evolution of Human Cooperation', *Philosophical Transactions of the Royal Society,* 2009:364 (2009), 3281-88.

50 Darwin was so concerned about this problem that he wrote to Asa Gray, 3 April 1860, ‘It is curious that I remember well time [sic] when the thought of the eye made me cold all over, but I have got over this stage of the complaint, & now small trifling particulars of structure often make me very uncomfortable. The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick!’ It can be seen he was making a more light-hearted comment than is implied by those that quote just the final sentence.

distinction between survival and producing offspring; an individual that survives to old age but produces no offspring is unfit in Darwinian terms. To produce offspring most animals must survive and mate and in certain animals, mating involves sexual selection. Many twentieth century books on evolution ignored or played down the significance of sexual selection but for Darwin it was sufficiently important to occupy two-thirds of his book on human evolution.

The third assumption was that evolution was concerned with species and Darwin reinforced this with his title *On the Origin of Species*.[51] However, evolution is a description of the consequences of the relative reproductive success of individuals. As previously explained, an individual is a contingent fact, a particular collection of genes (known as the genotype) that, like a recipe, leads in a particular environment to the development of an individual with a particular set of characteristics (known as the phenotype). In contrast, a species is an abstract concept that in many cases is hard to define. The idea that species are fixed, absolute and created by God was implicit in the culture and the language of the period. Implicit in the idea of species was form, the physical structure that enabled one species to be distinguished from another. Darwin used the word 'form' to refer to a particular contingent structure; for example, 'two forms, if differing very little, are generally ranked as varieties, notwithstanding that intermediate linking forms have not been discovered; but the amount of difference considered necessary to give to two forms the rank of species is quite indefinite.'[52] This idea reinforces Darwin's belief that beauty is contingent and depends on the interaction between two individuals, the viewer and the viewed.[53] The difficulty in defining species is part of the problem of classifying organisms, which today is part of cladistics, which originated with the work of Willi Hennig.[54]

The final assumption was that evolution was concerned primarily with sex. It was not until 1856 when Karl Theodor Ernst von Siebold published *Wahre Parthenogenesis bei Schmetterlingen und Bienen: ein Beitrag zur Fortpflanzungsgeschichte der Thiere* that any means of reproduction other than the fertilization of an egg from a female by a sperm from a male was considered possible.[55] Even in 1889, August Weismann wrote: 'But it

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51 As just explained, geneticists now look at evolution from the point of view of the gene.

52 Charles Darwin, *The Origin of Species* (London: Gramercy Books, 1995), p. 113.

53 In fact, it is now believed that there is a beauty race, the viewers, typically females in most animals, who can more finely discriminate beauty grow in numbers alongside the viewed, which are typically male, that display the characteristics of that beauty. This leads to the very rapid evolution of beauty constrained only by the exhaustion of that particular genetic recipe (see Dawkins, *The Selfish Gene* (2006), p. 304) or by the characteristic becoming so extreme it leads to premature death.

54 W. Hennig, *Phylogenetic Systematics*, trans. by D. Davis and R. Zangerl (Illinois: University of Illinois, 1999).

55 The 1857 translated version, *On a True Parthenogenesis in Moths and Bees; a Contribution to the History of Reproduction in Animals* is in Darwin's library. Parthenogenesis is a form of asexual reproduction found in females, where growth and development of embryos occurs without fertilization by a male.

was long before the facts of parthenogenesis were generally accepted: indeed, in some circles they are not received at the present day'.[56]

We now know that many plants and animals reproduce asexually and this raises the question of why sex evolved. The problem with sex is that it makes it harder for an individual to pass on their genes, it involves more energy finding a suitable partner and when an individual eventually succeeds it only passes on fifty percent of its genes. It would be far faster and more efficient, if all plants and animals simply cloned themselves.[57] The other major benefit is that males would not be necessary and so there would be less competition for resources. However, sex does exist and so various theories have been proposed recently to explain why, for example, sex increases variation through the random mixing of the genes of two individuals although it is not clear that this is sufficient to overcome the disadvantages and asexual bacteria can exchange genes anyway. In the nineteenth century it was not until Weismann published *Essays upon Heredity* in 1889 that the problem of sex was clearly seen and he asked the question as to whether it was possible 'males should become superfluous'.[58] Between 1859 and 1882, most commentators therefore regarded reproduction as concerned with sex and Darwin fuelled the social debate concerning the role of the sexes through his detailed observations of the nature of sexual union across a wide range of plants and animals.

Theories of Beauty in Britain

Many writers saw beauty as evidence for divine creation and often linked the beautiful with the good. These can be called religious theories of beauty and good examples would be those of John Ruskin and George Campbell (8th Duke of Argyll). As nature was regarded as divinely created, it was often associated with a purpose, which typically had a moral element. The aim of the artist according to these theorists was to capture natural beauty accurately and the artist and the artwork typically had a moral function and responsibility. These theories arose in response to a culture that regarded as common sense that God created the world, was actively involved in it and that art and artists had a moral responsibility to society.[59] The effect of the theories was to reinforce the existing hegemony of religious moral control and limit those who could be described as artists. Beauty was regarded as an absolute attribute of nature that had been created with a

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[56] August Weismann, *Essays Upon Heredity and Kindred Biological Problems*, trans. by Edward B. Poulton, Selmar Schönland, and Arthur E. Shipley, 2 vols (Oxford: Clarendon Press, 1889), p. 108.

[57] There are many mechanisms from cell division, budding, and spore formation to achieve parthenogenesis, where a new individual develops without sex.

[58] Weismann, *Essays Upon Heredity* (1889), p. 110.

[59] The Scottish Common Sense Realist, Thomas Reid (1710-1796), believed that what we take for granted without being able to give a reason are the principles of common sense and what is manifestly to the contrary is absurd. They were rejecting the views of the sceptics such as John Locke and David Hume particularly when they called Christianity into question.

purpose relative to humans and the task of the artist was to reproduce imaginatively natural forms and, if appropriate to the genre, to make a clear moral statement that could elevate the viewer.

Many academic theorists emphasised the artistic creation of beauty through the application of learned skills and techniques. This type of academic beauty was often associated with rules of proportion, style, tonal massing and colouration and one of the early English theories was described by Hogarth. Reynolds in his annual *Discourses* at the Royal Academy also regarded the production of beautiful paintings as something that could be learned from the study of the Old Masters. Although such writers may also have had religious motives and would support the necessity of a moral element as integral to work of the highest genre these aspects were not central to the creation of beauty. As beauty therefore resulted from an artist's skill and training the theories justified the practical value of training and, as the production of beauty was something that could be taught, it justified the regulation of training in order to preserve its quality and avoid untrained practitioners duping naive clients. Training could also be part of the acquisition of connoisseurship and the associated creation of a limited set of practitioners with 'taste'. The ideas were supported by the common sense appeal to the need for formal training to develop the skill required to produce an artwork that could be admired and which accurately represented the world sufficiently well for people and views to be recognized. The effect of such theories was to limit the number of people who could be called artists or connoisseurs and create a bureaucratic structure of training, validation and endorsement, which in turn created a small group within the art world with the power to control the market. Beauty was regarded as absolute but in a metaphysical rather than necessarily a religious way.

Others took these ideas further; there were theorists such as David Ramsay Hay who, in *First Principles of Symmetrical Beauty* (Edinburgh and London: William Blackwood, 1846) argued that beauty was based on certain underlying rules of proportion. These ideas were reinforced by a common sense appeal to the widely regarded beauty of classical works that were analysed by Hay and the idea, reinforced by Hay, that it may have been based on a canon of rules that has since been lost. Hay developed a complete theory based on mathematical ratios and proportions that was in turn derived from musical intervals and he wrote several books, culminating in David Ramsay Hay, *The Science of Beauty, as Developed in Nature and Applied in Art* (Edinburgh and London: William Blackwood, 1856). This showed how these ratios can be found in particular classical works that he analysed. Beauty was regarded as absolute and metaphysical but not necessarily associated with morality but rather a fixed set of principles we could discover and describe.

Artists often defined beauty as what certain artists produced and they stressed individual creativity rather than academic training or the use of rules. Such artists often led unconventional or 'bohemian' life styles and they can be regarded as an English avant-garde as, like the French avant-garde they were often outside the formal art establishment. Examples of such artists are James McNeill Whistler, Dante Gabriel Rossetti and Albert Moore. Whistler in his Ten O'clock Lecture made it clear that he considered beauty was not a property of nature but the result of the inspired genius of a small group of self-selected artists, such as himself. This figure of the Romantic artist was supported by such common sense ideas as the inability of formal training and bureaucratic academic selection to provide anything other than pastiche and 'painting by numbers'. Beauty therefore could only be produced by the artist not through training but because of his or her natural instinct, and someone could only produce beauty if he or she was a born artist. The necessary skill could not be explained or taught. The effect of these theories was to empower those artists that were regarded as part of the self-defining avant-garde group. Beauty was absolute in some general metaphysical sense but the artists were open to a wide range of cultural influences and different forms of beauty are found.

Artists differed in their attitude to nature, some, such as the Pre-Raphaelites, thought it important to look at nature afresh and reproduce what was seen rather than what had been taught. Some artists, such as Whistler, thought nature was simply the source of pictorial elements, like the notes of the piano, and it was the job of the artist to create the melody.[60] Other artists, such as those of the design reform movement saw nature as providing the templates that the artist could use to create beauty through, for example, the repetition of a simplified leaf pattern.

In the late eighteenth and early nineteenth century, the idea of associationism was developed and had a major influence on all the theories. The British 'Associationist School', including John Locke, David Hume and John Stuart Mill, asserted that the principle applied to all or most mental processes including the appreciation of beauty.[61] Beauty was therefore regarded as relative to each particular society and culture and based on learned responses during one's formative years. Opponents of the idea made fun of it by envisaging the type of society that might find grotesque objects beautiful. Beauty was regarded as relative as it was whatever had become valued by a particular

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[60] 'Nature contains the elements of color and form of all pictures – as the keyboard contains the notes of all music – but the artist is born to pick, and choose, and group with science, these elements, that the result may be beautiful', Whistler, *Mr Whistler's Ten O'clock* (Chatto and Windus), para. 40.

[61] John Locke, *An Essay Concerning Human Understanding* (London: Fontana Collins, 1964), pp. 250-55, Chapter 33, 'Of the Association of ideas' and David Hume, *A Treatise of Human Nature* (London: Fontana Collins, 1962), pp. 54-57, Section 4, 'Of the Connection Or Association of ideas'.

society and culture. Note that although Darwin's ideas are described as relative, by for example Walter Pater, beauty is grounded in an inherited trait and it can therefore be seen as absolute, a synthetic *a priori* in Kantian terms.

Associationism was related to psychology and physiology and in the 1890s, this link re-emerged as Pavlovian behavioural psychology and 'conditional reflexes'. Grant Allen developed a complete pseudo-scientific theory based on the physiology of pleasure and pain to explain the aesthetic sense, based loosely on Darwinian ideas.[62] These theories owed more to the associationists than to Darwin even though Darwin did seem to support the ideas of Allen.[63] According to Allen, beauty could vary from culture to culture and was therefore entirely relative but Darwin's theory implies that this was within certain limits constrained by the evolutionary makeup of humans in general and each race in particular.

Darwin introduced a new type of theory of beauty, one based on the evolution of a sense of beauty as a critical part of mate selection and the broader appreciation of beauty from various evolved responses to the world. Darwin's theory was purely materialistic and described the biological reaction to a physical form, colour or sound that had evolved through a process of natural or sexual selection. Darwin's ideas concerning beauty did not revolutionize artistic production directly but they did, as Pater and Ruskin realised, introduce a profound relativism and a materialistic basis to the recognition and production of art and beauty. Although many elements of Darwin's ideas seemed to defy common sense they were based on close observation and detailed rational arguments from evidence to theory. The power of the theory was its defiance of common sense as the logic of the argument called into question and undermined many commonly held beliefs and assumptions. For example, Darwin asserted that something as complex as the human eye could result from random changes over a long period and that bodily beauty had evolved because of arbitrary sexual mate choices.

Darwin's beauty is both absolute and relative. It is relative in so far as every race could have evolved different criteria for mate beauty, and Darwin argued that many had, but it was also absolute in that there are certain innate evolved habits, emotions and responses that we share with other living things and are common to all people. Darwin's book on *Emotions* describes many of these common responses. Of course, the innate

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[62] Allen, *Physiological Aesthetics* (1877), *ibid*.

[63] See letters from Charles Darwin to G.J. Romanes dated 23 May 1877, 27 May [1877], 11 June [1877] and 16 June [1877].

flexibility of human responses makes such common responses difficult to identify and the common sense assumption of free will argues against any type of restraint.[64]

The responses to the aesthetic implications of *Origin* were varied. The religious arguments were reformulated by George Campbell in his book *The Reign of Law* (1867). The difference between this and earlier works is that it is arguing against a widely read and respectable theory that no longer required a divine cause. However, this does not mean that all scientists agreed with Darwin; Wallace, for example, continued to maintain that sexual selection was unnecessary as everything could be explained using the theory of natural selection.

Two writers who understood the profound implications of Darwin's work were Ruskin and Pater. They reacted to Darwin in different ways, Ruskin realised Darwin represented a profound materialism that undermined all his ideas and Ruskin frequently belittled Darwin rather than present logical arguments against him. Pater recognized the fundamental shift Darwin's ideas brought about from the absolute to the relative. The writer who did the most to popularize the aesthetic consequences of Darwin's ideas was Grant Allen whose work *Physiological Aesthetics* (1877) is discussed later.

The aesthetic theory that today overshadows the others is that of Immanuel Kant in *Critique of Judgement*. At the time, Continental theories were seen in Britain as abstract and philosophical and many British theories were practical, evidence-based and part of a broader religious or moral message. They addressed questions such as whether beauty is universal, whether it is evidence of divine creation, and whether it reflects underlying rules of proportion and symmetry. The role of the artist was also discussed and whether beauty in art was derived from nature or from the artists' imagination. Darwin was the first to propose a natural mechanism he called sexual selection that could give rise to traits judged as beautiful in a wide range of animals including humans.

The various theories overlapped but they can be divided into a number of types in order to show the debate was multi-faceted and to provide a framework for the analysis of the impact of Darwin's ideas. Broadly, there were two axes of differentiation; the first was between the view that beauty was evidence for divine intervention or some form of metaphysical absolute in contrast to a mechanistic view based on scientific ideas such as evolution or physiological factors such as pleasure and pain. The second was between the establishment view that beauty resulted from following a method based on classical works and the Old Masters, combined with formal training, in contrast to the view that beauty arises from artistic inspiration and genius.

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[64] Charles Darwin, *The Expression of the Emotions in Man and Animals* (London: Fontana Press, 1999).

These types of theory translated into different approaches to nature and to the creation of artworks and the role of the artist. For example, a belief that nature was divinely created was typically associated with an approach to art that involved the close study of nature and a belief in a link between the beautiful and the good. A belief in formal training typically involved the study of nature, anatomy and the living model balanced against learning from the works of the Old Masters. A belief in artistic genius was associated with an unconventional lifestyle and the treatment of nature as a source of inspiration and a set of elements from which the artist could pick and choose. The four views overlapped in complex ways; for example, John Ruskin saw beauty as evidence for divine intervention but he also thought the artist needed formal training and should closely follow nature.

Artworks put the theories under a great deal of pressure as they often broke the 'rules' and opened up divisions and crossed boundaries. For example, John Everett Millais's *Christ in the House of His Parents ('The Carpenter's Shop')* (1849-50) was overtly a religious painting and the religious view was that the world and the beauty in it were divinely created. However, Millais's painting broke the conventions of religious painting as it took a new approach to representation based on a close attention to nature and a physically accurate depiction of a working class family in a dirty environment.

The evidence used here to help understand the cultural environment are the theories of beauty and the artworks, equivalent in some ways to the scientific theories and the results of the scientific experiments that may falsify a theory. However, the reproducibility principle of the scientific method assumes that the same results can be obtained within an agreed level of error in different locations and at different times but the artist works within a cultural paradigm and this is reflected in their work. The aim is to re-interpret the art of the period within the cultural paradigms of the period rather than within the conventional stylistic categories. In this way, the art will be better understood as a mechanism within the culture that helped or hindered major changes in cultural paradigms. This is not to imply a conscious proselytizing role for art but to see it as inevitably reinforcing or undermining particular cultural paradigms.

Art historians have tended to focus on the battles between, on the one side Ruskin and Arnold, who continued to stress morality in art, and the supporters of Aestheticism, Impressionism, Decadence and Art Nouveau on the other, where moral subject matter was subordinated to purely aesthetic issues of form and colour. Pater's criticism of Arnold, Wilde's denial of any ethical sympathies and the Whistler-Ruskin trial all suggest a bipolar alignment between certain critics and artists but it is clear from the wide range of theories of beauty that physiological and Darwinian aesthetics played a key role in the arguments concerning art and beauty in the 1870s and 80s.

The following is not intended to be comprehensive but is an overview of those aesthetic theories with which Darwin might have been familiar based on the books we know that he read.

Eighteenth-Century Theories

William Hogarth (1697-1764) addressed the common people rather than the connoisseur as his aim was to show that beauty is based on simple ideas, such as the 'line of beauty', and so can be appreciated by everyone. The 'line of beauty' was originally used as part of the frontispiece of his engraved works in 1745 and it caused a great deal of controversy as it was seen to be trying to reduce art to a set of rules.[65] He later developed a more comprehensive analysis of why we find certain scenes and works of art beautiful in *The Analysis of Beauty* (1753) that was criticized by Reynolds as it questioned the authority of academies and the Old Masters, such as 'Raffaelle'.

Hogarth was one of the first to bring art to a much wider audience and his theory can be regarded as part of his political, and what would today be called his marketing mission. Although I have described him as advocating academic beauty this is a simplification of a more complex view consisting of an Enlightenment view of art as a subject that is applicable to a much broader social group and the outcome of a rational approach. Hogarth described six principles or attributes that are associated with beauty—fitness, variety, uniformity, simplicity, intricacy and quantity. In this way, he decomposed an esoteric subject into ideas that could be understood by anyone and this enabled him to attack the art establishment. For example, by fitness, he meant that the work of art must be suited to its purpose and accurately observed and although he pointed out that this is not a source of beauty, he regarded it as a necessary prerequisite.[66] Variety refers to the 'charms of beauty' that he links to Shakespeare by quoting Anthony's description of Cleopatra's power.[67] Regarding uniformity, Hogarth makes the point that mathematical divisions and proportions, even those that have been linked to music have nothing to do with beauty and uniformity only pleases when it is seen with fitness. Similarly, simplicity must be combined with variety to provide interest. By simplicity, he meant for example the massing of forms into a clear foreground, middle ground and background. He gave blunt

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[65] Reynolds anonymously published a criticism of Hogarth in *Idler* No. 76, 29 September 1759, see Ronald Paulson, *Hogarth: Art and Politics, 1750-1764* (Cambridge: Lutterworth Press, 1993), pp. 255-56. Paulson points out that Reynolds specifically objected to Hogarth's attempt to impose a rule, the serpentine line, on the work of the Old Masters, which can only be understood by studying their complex practices as a whole. He ironically referred to 'this enlightened age' in which 'the art has been reduced to principles'.

[66] He gives as an example of fitness the need when painting watermen to show their broad shoulders and thin legs ('spindle shanks'), Hogarth, *The Analysis of Beauty Written with a View of Fixing the Fluctuating Ideas of Taste* (1772, first published 1753), pp. 85-86.

[67] 'Nor customer stale ¦ Her infinite variety (Act 2, Scene 3)', *ibid*., p. xvi.

and forthright descriptions and often criticised fine art, such as when he describes the Laocoön in which we see 'the absurdity of the sons of half the father's size', which was done he explains in order to create the simple enclosing shape of a pyramid.[68]

Intricacy is a formal property that consists of constructing the lines and shapes of the composition such that they lead 'the eye a wanton kind of chase'.[69] He believed that intricacy combined with variety gives pleasure to the mind and justifies the term beautiful. Quantity is associated with awe and grandeur as long as it is appropriate to the person or scene otherwise it will invoke ridicule and laughter. Later Burke was to distinguish clearly between the beautiful and the sublime but Hogarth deals with them together using the term greatness to refer to the sublime. The sublime was first brought into discussion in Britain by Nicolas Boileau-Despréaux's (1636-1711) translation of Longinus's *On the Sublime* in 1674.[70]

Hogarth is describing a practical analysis of beauty based on the balance of counterbalancing forces, what might be called a common person's guide to recognizing the beautiful. He was seeking to broaden the audience for art by removing its associations with foreign connoisseurship. He thought their philosophical doctrines of aestheticism would not be accepted by the pragmatic English and they had led to a preference for foreign artists supported by the English art establishment, which promoted French, Dutch and Italian Old Masters.

Edmund Burke (1729-1797) was specifically mentioned by Darwin in his Notebook M. Burke published *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* (1757) a few years after Hogarth. He takes a more sensuous approach than Hogarth does and he makes a clear distinction between the beautiful and the sublime, a distinction that Kant was to maintain and analysed in more detail later in the century. He started with an analysis of the difference between pleasure and pain, a distinction that Grant Allen built on a century later but from a biological standpoint. Like Hogarth, Burke wished to consider the elements that make up the beautiful and the sublime but he started by explaining that the common assumption that it is associated with proportion, fitness, and perfection is wrong. Burke maintained beauty is concerned with smallness, smoothness, gradual variation and delicacy. He associated beauty with love and noted that we often associate love with the small and delicate and the diminutive ending, such as darling ('little dear one'). He also associated beauty with smoothness and gradual change and noted that as soon as objects become large and jagged they may be

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68 *ibid*., pp. 21-22.
69 *ibid*., p. 25.
70 The author is unknown, the ascription to 'Longinus' was a mistake made by a medieval copyist. Boileau translated the Greek into French, one early English translation is Longinus, *On the Sublime* (1734).

sublime but they are no longer beautiful. He complimented Hogarth's line of beauty but criticized the fact that he found angular figures beautiful. Delicacy is an attribute that he associated with beauty and he wrote: 'the beauty of women is considerably owing to their weakness or delicacy', a point that Whistler restated a century later.[71] Finally, beauty was associated with clear and bright colours and he recommended that if they are strong and glaring they must be diversified with others. Burke's aim was not to determine the ultimate cause of the sublime and beautiful, which he places 'at the throne of God himself', but to determine the link between certain qualities and certain emotions.[72] In other words, he was elucidating the mechanism rather than searching for the cause. It was not until Darwin's unprecedented theory of sexual selection that a cause was first described.

Like Darwin, Hogarth and Burke were working in the materialist and pragmatic English tradition but unlike him, they were not trying to determine causes but to uncover interesting associations. Like Darwin and Allen, Burke considered the connection between emotions, such as the link between pain and terror in humans and other animals.[73]

On 10 December 1768, the King founded the Royal Academy of Arts, an organization created by Reynolds who gave his first Discourse as President on 2 January 1769. From the beginning, Reynolds's *Discourses* described and created a tradition of academic art based on the French model. Within the first five minutes of the first Discourse, he had distanced The Royal Academy from any mercantile associations and modelled it as hierarchical with the King at its head. In the next five minutes he went on to describe art as an activity of the elite and the Royal Academy as the guardian of a tradition based on the 'accumulated experience of past ages'. He explained that Raphael learned from Michelangelo to drop his 'dry, Gothic, and even insipid manner, which attends to the minute accidental discriminations of particular and individual objects' and assumed a grand style which 'improves partial representation by the general and invariable ideas of nature.'[74] Reynolds went on to 'chiefly recommend, that an implicit obedience to the *rules of art,* as established by the practice of the great masters, should be exacted from the *young* students.'[75] For Reynolds the rules are not, like Hogarth's, concerned with simplification but with academic study, connoisseurship and the authority of the Old Masters.

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71 Burke, *Philosophical Enquiry*, 2nd edn (1757), p. 206.
72 *ibid*., pp. 225-26
73 *ibid*., p. 231
74 Reynolds, *Discourses* (1778), pp. 10-11. A well observed description of Raphael's early style, which became the hallmark of the Pre-Raphaelite movement eighty years later. Reynolds describes the grand manner in terms that embody the essence of the criticisms of the Pre-Raphaelites.
75 *ibid*., p. 13, original emphasis.

Reynolds theory of beauty was elaborated in his *Discourses* but beauty became secondary to Art, which was based on tradition, a formal programme of teaching, and the imaginative representation of nature in the style of the Old Masters. Beauty was associated with the 'ancients' and understood through the attentive study of the human form. When he discussed beauty in *Discourse 3* it is with respect to Phidias and his 'perfect idea of beauty' which was not based on 'any one human figure as a pattern' but 'a more perfect idea of beauty fixed in his mind'.[76] Reynolds admitted this idea is paradoxical as the artist must go to nature but must also rise above 'all singular forms, local customs, particularities, and details of every kind.' He was endorsing the Romantic idea of the creative genius but constrained within the necessary rules and discipline of accepted practice. His gave the example of Claude Lorraine who 'was convinced that taking nature as he found it seldom produced beauty.'[77]

Although my focus is on British theories of beauty, the influential work of German philosophers and art historians must be mentioned. The father of the systematic study of art history is often regarded as Johann Joachim Winckelmann's (1717-1768) because of his systematic analysis of Greek art which came to dominate later European ideas of perfect beauty. Gotthold Ephraim Lessing (1729-1781) was inspired by Winckelmann to write *Laocoön: An Essay on the Limits of Painting and Poetry* (1766) in which he described the aim of art as pleasure which therefore required laws to control and direct it. He regarded beauty as the 'supreme law of the art of design' to which everything must be 'rendered subordinate'.[78] As an example he described how the artist that produced the Laocoön subdued the expression of 'extreme bodily pain' for the sake of beauty.[79]

In 1790, Immanuel Kant (1724-1804) published *Critique of Judgement*, a work that is difficult to summarise, as it is part of his broader epistemological analysis. Kant believed that certain aspects of our knowledge of the world result from the way our minds are organised. For example, space, time and causality are not part of the world but are part of the way we organise and understand it. Kant distinguished between our knowledge of objects in the world, which we gain from sense data, and the thing-in-itself of which we have no knowledge and which he called the noumenon.

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[76] *ibid*., Discourse III, 11 December, 1769.

[77] *ibid*., Discourse IV, 10 December, 1771. He described a sentiment that Whistler would have sympathy with over a hundred years later.

[78] Lessing, *Laocoön: The Limits of Poetry and Painting* (1836, first published 1766), p. 19.

[79] *ibid*., pp. 23-25. Lessing added that this 'offence against decorum' was described by Adam Smith as 'These attempts to excite compassion by the representation of bodily pain, may be regarded as among the greatest breaches of decorum of which the Greek theatre has set the example.' Adam Smith, *The Theory of Moral Sentiments* (London: T. Cadell, 1767), pp. 44-45. Lessing explained how the Laocoön avoids this error.

Kant divided knowledge into two types, sometimes called the analytic and the synthetic. Analytic knowledge is true by definition, the terms used simply restate their own meanings in other words ('All humans are animals.') and a synthetic proposition is one in which the predicate is not contained in the subject ('Humans and gorillas are descended from a common ancestor.'). This distinction can be contrasted with another distinction he made between *a priori* propositions, those that do not depend on experience, and *a posteriori*, which do. He combined these two distinctions to create four types of knowledge, although Kant thought that analytic *a posteriori* knowledge was contradictory, as we do not need to turn to the world to determine the internal logic of a proposition, a view that has been disputed more recently.[80]

Kant viewed judgement as coming between the fixed, deterministic rules of understanding and the freedom of reason. He distinguished between two types of judgement, a determinative judgement, which decides that a particular is an example of a general class ('That is a chair'), and reflective judgements that seek an unknown universal for given particulars ('That chair is beautiful'). For Kant the agreeable is purely subjective, for example, 'This meal is excellent,' but at the other end of the spectrum, he regarded moral judgements as purely objective. In between are the beautiful and the sublime, which for Kant are both subjective and universal. This does not mean he thought we all agree on aesthetic judgements but that when each individual forms a judgement that person believes that everyone else should agree even though they know many will not. So the universality is concerned with the way we act and this is the reason why there are often intense aesthetic arguments about the beauty of a work of art but not about whether broccoli tastes nice.

Although radically different in approach Darwin can be seen as providing a biological framework for the interpretation of some of Kant's views. If our sensory apparatus evolved over millions of years in a process of infinite refinement in which incorrect knowledge about the world meant death then we can be seen not as isolated observers of an external world but as a part of the world that observes itself. The thing-in-itself shrinks and disappears as the observer evolves to incorporate the thing-in-itself within itself. The positivist view that all authentic knowledge is based on sense experience is therefore undermined by Darwinism as *a priori* knowledge of the world is incorporated within the observer through the evolution of its sensory and processing apparatus. An important example is beauty as the judgement of the beautiful results from

[80] Kant was not concerned with the fact that we must learn the terms from the world in the first place as he was only concerned with how we understand, reason and make judgements about them once we know them. Kant's distinctions start to break down when more complex examples are considered, for example 'Water boils at 100C' and 'His mother did not die two weeks before he was born.' turn out to be synthetic rather than analytic.

thousands of generations of shared choices. We are all the result of the same, or similar, judgements regarding mate beauty, which provides a biological basis for Kant's view that judgements concerning beauty are universal. This does not mean that we all agree or that there are not racial differences it simply means that we cannot simply regard an observer as an isolated entity decoupled from the world like a well-engineered robot.

In the second half of *Critique of Judgement* Kant deals with teloelogical judgement. This is best summarised by Arthur Schopenhauer who wrote: 'The whole book tries to say only this: that although organized bodies necessarily seem to us as though they were constructed according to a conception of purpose which preceded them, this still does not justify us in assuming it to be objectively the case.'[81] It was Darwin who showed objectively that it is not the case. In 1802 William Paley (1743-1805) published *Natural Theology*, a book that influenced Darwin when he was at Cambridge.[82] He began with the well-known example of the watch found on the ground and seeks our agreement that it must have been designed. A less well-known example he provided in the next chapter is the existence of a self-replicating watch. He believed that any observer would conclude that the watch had a maker and although the self-replicating watch was made by another self-replicating watch, he believed that anyone would conclude that there was an original self-replicating watch that was the work of a designer and a creator. From this, he argued that the much more intricately constructed plants and animals are proof that some original ancestor was designed and created by God. The existence of imperfection and of parts with no apparent purpose he did not regard as diminishing the argument. Beauty he regarded as a general property of animal forms and he used the term to mean how 'well these things are wrapped up, so as to form a mass, which shall be capable of symmetry in its proportion, and of beauty in its aspect; [...] All which seems to be a strong indication of design, and of a design studiously directed to this purpose.'[83] The book presents an Enlightenment view that the whole of creation demonstrated the general happiness of God's creation and the fitness of the social hierarchy of plants and animals.

Nineteenth-Century Theories

Herbert Spencer used the term 'survival of the fittest' in *Principles of Biology* (1864) when he was drawing parallels between his economic theories and Darwin's ideas. Although Spencer's analogy is often used to explain the simplistic connection between biological

[81] Arthur Schopenhauer, *The World as Will and Representation* (Cambridge: Cambridge University Press, 2010), p. 563.
[82] Paley, *Natural Theology: Or, Evidences of the Existence and Attributes of the Deity*, 12th edn (1809).
[83] *ibid*., pp. 127-28.

survival and capitalistic exploitation of the disadvantaged there were other interpretations of Darwin's work. Peter Kropotkin (1842-1921) regarded 'survival of the fittest' as supporting co-operation, for example in *Mutual Aid: A Factor of Evolution* (1902) he argued that the fittest may result from a community that works closely together. A similar socialist idea of a co-operating society of the future is described by William Morris in *News From Nowhere* (1890).[84] Although written after Darwin's death it does reflect social views that Morris held in the 1870s when he began to take an active interest in politics. The point is that Darwin's ideas were subject to multiple conflicting intepretations when they were applied to other areas such as politics and society.

In *Beauty* (1836), Alexander Walker (1779-1852) specifically considered beauty in women from a scientific and anthropological point of view, an area that Darwin was later to examine in terms of sexual selection. Walker advocated that the male should select the female based on her naked form, that adolescents be instructed in sexual reproduction in clear and rational terms, that sexual continance be observed in order to preserve bodily strength and that we should avoid effeminacy, sexual abuse and self love as they lead to 'not merely the ruin of families but the degeneration of races, and the decay of empires.'[85] He also pointed out that the other danger for the sexually promiscious is that nine out of ten women are 'in a state of pollution' and the only cure, mercury, for the 'hideous diseases' of such women is itself a poison. Beauty is that which is possessed by objects that results in exciting emotions of pleasure in the mind. He divided beauty into minor beauty or prettiness—the beauty of women, and grandeur or sublimity—the beauty of men. He also disagreed with many of Burke's attributes of beauty including smallness.[86]

Benjamin Robert Haydon

Benjamin Robert Haydon (1786-1846) gave a lecture in 1846 called 'On Beauty' at the School of Design in Leicester Square. In it he discussed the theory of association and beauty put forward by Archibald Alison (1757-1839) in *Essays on the Nature and Principles of Taste* (1790) and discussed by Francis Jeffrey (1773-1850, later Lord Jeffrey).[87] Haydon criticized Alison and Jeffrey for maintaining that beauty is solely

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[84] William Morris, *New from Nowhere or an Epoch of Rest Being Some Chapters from a Utopian Romance* (London: Longmans, Green, and Co., 1908, first published 1890).

[85] Alexander Walker, *Beauty; Illustrated Chiefly by an Analysis and Classification of Beauty in Woman* (London: Effingham Wilson, 1836), p. 38.

[86] *ibid*., p. 46. He points out that Burke's analysis of 'darling' as 'little dear' is a 'blunder' as the little refers to 'that dependence which enhances love' not to physical size.

[87] 'Chit-Chat About Art and Artists', *Art-Union,* 1 (15 February, 1839), 10 (p. 10). Francis Jeffrey wrote an essay on beauty that was indebted to the associationist Archibald Alison and which later was incorporated in his review Jeffrey, 'Review of Alison's "Essays on the Nature and Principles of Taste"', *Edinburgh Review,* 18:35 (May, 1811), 1-46. A modified and expanded version was incorporated in a supplement on beauty to *The Encyclopaedia Britannica* of 1824.

dependent on associations because, he argued, taken to the extreme this results in and maintains that ugliness and beauty are inherently the same. Haydon equates beauty with the human figure and regarded no modern artists as equalling the ancients who 'hit exactly, what degree of fitness, proportion, unity, curve, and colour in nature and art, was adapted to excite the emotion of beauty in the human mind'.[88] Haydon believed beauty was not a single principle but sometimes a simple sensation and at other times a complex one that depended on association. In passing he criticized Reynolds for equating beauty with a single truth that is only known to those who study these things. Haydon believed that beauty was perceived by the 'mass of mankind' and taste consisted of distinguishing the beautiful from the ugly rather than the true from the false. Darwin also believed that all humans have evolved to recognize beauty as it is a fundamental aspect of sexual selection and he also believed it has nothing to do with truth.

Haydon believed that beauty has its origins in woman and that all beautiful objects, even trees, columns and vases, reflect some aspect of beauty in woman. Haydon thought that beauty was not a simple, universal reaction to a sensation but varied from person to person and that although Locke saw the human mind as a 'white sheet' he saw it as 'brown paper, and whity-brown paper, foolscap and post'.[89] He pointed out that there is something in every object that excites the emotion of beauty independently of any association. Haydon argued against Reynolds's claim that beauty is relative. Reynolds wrote that a 'negro' would paint a beautiful goddess with 'thick lips, woolly hair [...] and black skin' but Haydon claimed that the white European male has a larger skull than the 'negro' and is therefore superior and so God must look like a white European male and this is therefore the absolute standard of beauty.[90] Darwin disagreed with this conclusion and believed that every race has evolved its own standards of beauty.

The theory of association put forward by Alison argued for complete relativism, any object would become regarded as beautiful if it was associated with pleasurable rememberances. Haydon pointed out inconsistencies in Jeffrey's argument as he believed that the emotion of beauty is instantaneous but is dependent on associations learned over time. Haydon defined what he called physical beauty which makes the first impression on the brain and is defined by its form and colour. Physical beauty then excits further associations we establish over time to create what he calls intellectual beauty. Although this distinction could be equated with Darwin's distinction between instrinsic beauty resulting from sexual selection and cultural beauty Haydon went on to claim that

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[88] B. R. Haydon, *Lectures on Painting and Design* (London: Longman, Brown, Green, and Longmans, 1846), p. 254.
[89] *ibid*., p. 260.
[90] *ibid*., p. 265.

all beauty has a feminine tendency and all sublime tendencies are associated with God, conclusions that ran counter to Darwin's ideas.[91]

David Ramsay Hay

Another writer on beauty at this time was David Ramsay Hay (1798-1866) who took an entirely different approach but one that was also inspired by Greek sculpture and architecture. Hay became a well-known Scottish interior designer and theoretician and was one of the founders of the Edinburgh Aesthetic Society in 1851. In 1856, he summarised his ideas on beauty in *Science and Beauty* and although some have argued that his work was derivative on that of George Field (1777-1854) especially in the area of using mathematical proportions for defining colour relationships, he extended those ideas to cover form. Both Field's and Hay's theories were adopted by the Department of Science and Art at South Kensington in the 1850s where they were incorporated in the teaching of Richard Redgrave and Owen Jones. Although Hay is not a well-known name today, he was described at the time of his death in 1866 as 'the true Pythagoras'.

Hay argued that we can only move forward from the high point of Greek art by recreating the science and mathematics behind their artistic productions. Hay quoted Reynolds, in contradiction of Ruskin, 'Nature herself is not to be too closely copied'.[92] Hay explained that the English school regarded all tastes as equally just but the German and French writers thought that beauty was absolute, although its forms are varied. Victor Cousin went as far as to claim that 'for the theory of fine arts to be possible, there must be something absolute in beauty'.[93] Hay believed that this absolute framework provided a solid foundation for a scientific theory of beauty based on proportions analogous to the proportions and harmony of music. Beauty, he believed was a combination of harmony, the union of contrary principles according to some ratio, and the contrary principles of uniformity and variety. He thought that harmony within complex variety, for example, as seen in flowers, can be perceived as beauty by everyone but can only be imparted to a work of art by a genius. He said that the highest degree of beauty is found within the human figure and he explained picturesque beauty as resulting from what had been symmetrical beauty blended with the picturesque through decay.

Hay developed a series of fractions divided into four scales that he first applied to sounds to generate the musical scales and then to forms. He applied the fractions to architectural forms in order to determine the angles that should be found in beautiful

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91 *ibid*., p. 283.

92 Hay, *The Science of Beauty* (1856), p. 7 quoting Ruskin John Ruskin, *Modern Painters: Their Superiority in the Art of Landscape Painting to All the Ancient Masters Proved by Examples of the True, the Beautiful, and the Intellectual, from the Works of Modern Artists, Especially from Those of J.M.W. Turner, Esq., R.A.*, 5 vols (London: Smith, Elder and Co., 1843), Discourse III.

93 Hay, *The Science of Beauty* (1856), p. 8.

buildings and he then compared the angles they represent with those measured on the buildings regarded as beautiful. He measured the Parthenon, the front portico of the temple of Theseus and the east end of Lincoln Cathedral and found them 'in perfect agreement' with his predictions. He pointed out that the essential element that all these structures exhibited was the ellipse and not as had previously been assumed, the circle.

He wrote, 'Start with the "indivisible monad"', that is the number one. He then gave procedures for generating the integers using addition and he pointed out various facts he regarded as significant such as the first four integers add up to the number of digits on a typical human's hands. He went on to provide a method for creating a table of ratios by sub-dividing between the monad and the duad and forming the reciprocal, one to a half. Further lines were created by dividing by the duad, giving a half to a quarter and so on. He then related this table to the musical scale where each fraction represented a note.

He applied his rules of harmony to the human face after first dismissing the simplistic facial angle theory of Petrus Camper (1722-1789) and Richard Owen. Instead of a single simple angle he found a complex harmony of related ratios are necessary for beauty and they could not therefore have resulted, as sometimes claimed, from the mere assembly of beautiful parts from many models. As Hay was working with angles and not linear proportions he shows how his theory could be applied as easily to a figure of Hercules as to a figure of Venus by simply changing the fundamental angle.

He developed a series of ratios between the primary colours, red, yellow and blue and their contrasting colours green, purple and orange. This led to a table of ratios representing the colours which, he argued, enabled a harmonious collection of colours to be produced using the same, or analagous ratios to those used in music. He dealt with the problem of colour blindness that had caused a major problem for Haydon as he simply categorised it as a defficiency in a small number of people who were therefore unable to appreciate the harmony of colours in the same way as other people. Although Hay's theory is often compared with the work of Field, for example, as described in his major work *Chromatics, of the Analogy, Harmony and Philosophy of Colours* (1845), the two theorists had different aims; Field was looking for poetic associations between colour and music while Hay was looking for precise mathematical formulae.[94]

Hay asked us to imagine a musical instrument with a single vibrating string, the so-called 'Pythagorean monochord', and then hold down the string at the fractional

[94] See George Field, *Chromotography; or, a Treatise on Colours and Pigments, and of Their Powers in Painting, &C.* (London: Charles Tilt, 1835, first published 1811) and George Field, *Chromatics; or, the Analogy, Harmony, and Philosophy of Colours* (London: David Bogue, 1845).

position indicated; it will give the specified note. For example, if we stop a vibrating string half way along, we obtain the octave of the fundamental note and if we stop it two-thirds of the way along we get a perfect fifth. Then, through a further complex procedure he generated a palette of colours which he related back to the musical scale. In this way, he claimed to have rediscovered the lost canon of beauty for forms and colours that he believed was known and used by the ancient Greeks. He justified this claim through his use of only simple rules and procedures, through its relationship with the musical scale used by the Greeks and an empirical procedure for measuring the ratios he found in ancient buildings and sculpture.

To apply the table to a work of art or a building he converted the fractions into angular degrees by regarding each entry in the table as a fraction of the right angle, ninety degrees. He then showed how to measure the angular sub-divisions of various figures, for example, the human face where you can see the pivot point is the top of the head and the angles are measured to the intersection of each major feature with the outline. The human body was measured using a similar scheme of drawing straight lines that intersect a horizontal line joining a major feature with the outline and buildings were also analysed in this way. Hay extended his procedure by inscribing circles and ellipses within the figures in order to show how the more complex curves found in everything from figures to vases could be incorporated within his system.

Hay built up form from basic structures such as three types of line, angle and curve and three primitive shapes, the circle, triangle and square. He then applied ratios to these based on musical theory, the ratio 5:4 corresponding to the third, and the ratio 2:3 corresponding to the dominant.[95] From these basics he built up more complex shapes and then applied these shapes and ratios to 'the most perfectly harmonious production in architecture that exists', the Parthenon.[96] He showed how it corresponds to his musical ratios and even gave the musical chord corresponding to the building and in *Principles of Beauty* he applied a similar method of ratios to the human body.[97] A major aim of Hay's research was the elucidation of the aesthetic principles underlying Greek art.[98] Although the attempts to reconstruct the Polykleitos canon did not take place until after the discovery of the copy of the *Doryphorus* in 1863 the association of Greek art with

[95] Hay, *The Natural Principles and Analogy of the Harmony of Form* (1842), pp. 14-42.
[96] *Ibid*., p. 36.
[97] Hay, *The Natural Principles of Beauty* (1852).
[98] I. Gow, 'The Northern-Athenian Tea Pot', *Burlington Magazine,* 131:1034 (May, 1989), 353-55 (p. 354).

mathematical rules of beauty was known at least from the early Renaissance and Haydon mentions the Canon as a standard of beauty in his 1846 lecture.[99]

John Addington Symonds (1840-1893) in *The Principles of Beauty* took a structured view based on the development of beauty from a 'sensation', through intellectual beauty, and then moral beauty to ideal beauty. In his first chapter he referred to what he called the genius of Hay's theory, in that it referred to angles rather than as Harrington proposed in a letter to Sir Isaac Newton on the proportions being based on the harmonic ratios of music.[100] He then gave a long summary of Hay's theory applied to sound, the human face and figure as well as architecture. Symonds went on to discuss the physiological pleasure to be derived from the beauty of form.

In 1840, John Stuart Blackie (1809-1895) gave the first of what became an extended series of lectures on beauty in many cities, including Edinburgh. In 1858, he published a book of these lectures called *On Beauty* in which he criticized the association theory that had long been connected with the city. His views were supported by Hay and William Hamilton who had been elected to the Edinburgh chair of logic and metaphysics in 1836. He proposed a theory of beauty based on Greek art, as he believed the Greeks were the civilization that had been created by God with the finest aesthetic abilities. He quoted Ruskin as saying that we are intended to be under the influence of beauty as all objects of nature were created by the Deity to be beautiful.[101] He savagely criticized the Scottish people as 'a very vulgar, and a very Gothic race' whose Protestant beliefs have separated them from true art and he analysed beauty in terms of order, symmetry and rhythm giving as an example the God-given beauty of crystals. This can be compared with Ruskin's analysis in terms of what he called 'Unity and Symmetry'. Why we like certain forms and colours and not others was regarded as a question that cannot be answered and Ruskin described our ultimate instincts as resulting from 'the simple will of the Deity that we should be so created.'[102] Blackie continued however, to discuss a long

[99] Andrew Stewart, 'The Canon of Polykleitos: A Question of Evidence', *Journal of Hellenic Studies,* 98 (1978), 122-31 (p. 122). The other classical association between proportion and the human body is Pollio Vitruvius, *The Ten Books on Architecture* (Cambridge, MA: Harvard University Press, 1914), pp. Book 3, Chapter 1, Sections 1-9. Vitruvius described how 'nature has designed the human body so that its members are duly proportioned to the frame as a whole' and describes how a circle and a square can draw around 'a man placed flat on his back, with his hands and feet extended', the 'Vitruvian Man', and he then analysed the mathematical proportions of the body, for example, 'the foot is one sixth of a man's height'. 'Alison adds, there is in the works of the ancients no standard proportion. This is quite a mistake: Polycletes, says Pliny, made a figure called the Canon', Haydon, *Lectures* (1846), p. 277.

[100] Hay, *The Science of Beauty* (1856), p. 9.

[101] John Stuart Blackie, *On Beauty: Three Discourses Delivered in the University of Edinburgh with an Exposition of the Doctrine of the Beautiful According to Plato* (London: Simpkin, Marshall, and Co., 1858), p. 2.

[102] Ruskin, *The Works of John Ruskin* (1903-12), Vol. 3, 'Modern Painters 1', 109.

list of attributes associated with beauty such as congruity, actuality, perfection, expressiveness and moderation as well as topics such as the ludicrous and the sublime.

Richard Owen

Richard Owen (1804-1892) did not write specifically about beauty but he was an outspoken opponent of Darwin and his disagreement related to what he called archetypes, a form of development within 'ordained continuous becoming'. His idea was that a limited form of evolutionary change was possible but not sufficient for one species to change into another. Each species evolved within the constraints of a divinely ordained archetype that was a type of model in the mind of God that represented the perfect form of the species. The idea was therefore related to the idea of perfection, which related to the ideal in art. The same idea occurs in Greek philosophy and in Galton's idea of classification using composite photography. This was seen as a scientific method of pursuing the aims of physiognomy, the assessment of a person's character from their outward appearance, particularly their face. The subject was frequently discussed in periodicals although it had not advanced since Johann Lavater's (1741-1801) *Physiognomy* and it had never been placed on a scientific basis.[103]

What is relevant to art is the debate about whether there is such a thing as ideal or absolute beauty and if so how it should be achieved by the artist. Artists were also interested in how to represent different types of character so they might be immediately recognized and how to represent a 'frozen' moment of a face expressing an emotion. Artists typically approached idealization in a number of practical ways, they looked at examples, particularly from classical art, of what were generally regarded as ideal beauties, they found models that had faces and bodies they regarded as ideal, they might remove blemishes and improve contours and they might combine features from different models or from classical statues, Old Masters and living models. These techniques raised the question of what the artist was trying to achieve and whether some of the techniques were morally correct and 'true to nature'. The Pre-Raphaelites made the point that professional models would always adopt set poses and this prevented a natural pose, and as a result, they recommended the use of friends.[104]

Owen also claimed to have discovered natural selection at the same time as Darwin but it is not clear from his later writing that he agreed that species evolve. He wrote: 'Of the nature of the creative acts by which the successive races of animals were

[103] Johann Caspar Lavater, *Physiognomy; or, the Corresponding Analogy between the Conformation of the Features and the Ruling Passions of the Mind* (London: Cowie, Low, and Co., 1826, first published in German 1775-1778).

[104] Ford Madox Brown, 'On the Mechanism of a Historical Picture: Part 1, The Design', William Michael Rossetti, *The "Germ": The Literary Magazine of the Pre-Raphaelites*, ed. by Andrea Rose (London: Elliot Stock, 1901), p. 71.

called into being we are ignorant But this we know that as the evidence of unity of plan testifies to the oneness of the Creator'[105] Owen is also well known for his argument with Huxley about whether gorillas differed fundamentally from humans in the shape of their skull and the form of the bones that made up its structure.

John Ruskin

Darwin's evolutionary accounts of beauty were a challenge to Ruskin's 'theoretic faculty' (his term for the aesthetic faculty).[106] Darwin regarded aesthetics as associated with the recognition of beauty, which he regarded as a utilitarian trait that had evolved for mate selection. Ruskin was concerned that Darwin's ideas linked the aesthetic sense in humans with the physical sensations of animals and this provided a naturalistic and scientific basis for the promotion of materialism. He realised that if beauty was about utility rather than morality it became merely another Victorian commodity to be exploited.

However, Ruskin did not put forward a coherent argument against Darwin's views but attempted to ridicule them. For example, he wrote: 'the scientific world professed itself to have discovered that the mollusc was the Father of Man' and while claiming in a footnote that his ideas 'are in nowise antagonistic to the theories which Mr. Darwin's unwearied and unerring investigations are every day rendering more probable' he then continued by asserting that 'the characteristic form of each species is entirely individual' which for Ruskin meant immutable.[107] In *The Eagle's Nest,* he wrote that 'Had Darwinism been true, we should have long ago [...] changed ourselves into Briarean Cephalopoda.'[108] In *Mornings in Florence,* he went as far as to say 'Darwinism, like all popular and widely mischievous fallacies, has many a curious gleam and grain of truth in its tissue.'[109] His attempts to make fun of Darwinism culminated in the widely quoted skit in *Love's Meinie* in which he suggested that by 'fastening a hair-brush to a mill-wheel' it would, on hearing a steam-whistle, fall in love with the whistle, lay an egg, and produce a nightingale.[110]

Ruskin argued that the imperfection of the world prevented it being equated with any mechanical explanation. In endnote 7 of *The Story of Arachne* he described the

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[105] Owen, *The Principal Forms of the Skeleton and of the Teeth* (1854), p. 228.
[106] Ruskin was opposed to the term 'aesthetics' as he thought it reduced beauty to mere sensation and he insisted on using his own term 'theoria' and the study 'theoretics' in order to emphasize the true and the good.
[107] Ruskin, *The Works of John Ruskin* (1903-12), Vol. 4, 'Modern Painters 2', 143.
[108] *ibid*., Vol. 22, 'The Eagle's Nest', 246, Briareus was a giant fabled monster with a hundred hands and Cephalopoda are molluscs including the octopus. Ruskin is making fun of what, if Darwin is true, he suggests is the arbitrary nature of why we have one head and two arms and two legs.
[109] *ibid*., Vol. 23, 894.
[110] *ibid*., Vol. 25, 36.

‘amazed awe’ with which he watched a locomotive ‘take its breath at a railway station’.[111] He continued by describing the many ways in which animals are imperfect, including the ‘ignoble’ eating habits of eagles and the ineffectual ‘slobbering’ of the pelican trying to eat. He contrasted this with his ‘much respected friend Professor Huxley’ who asserted sight was a ‘mechanical operation’. The disagreement was therefore regarding the use of a mechanism as a metaphor for an animal or an organ. For Huxley, the metaphor suggested that the component parts can be disassembled and their function understood without any mysterious or metaphysical explanation being required; for Ruskin, the metaphor implied, or he disingenuously took it as implying, a perfection of function that ran counter to his experience of the ‘awkwardness’ of animals. As always, Ruskin had a specific agenda; by stressing the fallibility of animals, he was able to present them as difficult to explain through a mechanistic metaphor and by finding fault with the metaphor, he was able to imply that they were outside the scope of science, enabling him to introduce a divine explanation. He referred to the same Huxley metaphor in *The Eagle’s Nest*, although he only referred there to a ‘great physiologist’ and he specifically added that ‘Sight is an absolutely spiritual phenomenon’.[112] For Ruskin the danger was a scientific materialism that sought to explain everything including the aesthetic leaving no room for the spiritual and the moral.

Ruskin and Darwin did meet and Ruskin appreciated Darwin’s simplicity and humility but regarded him as misguided and of limited vision.[113] On his side, Darwin could make out nothing of what Ruskin saw in his Turners. Ruskin knew of Darwin’s ignorance of good art and lamented his inability to draw. Ruskin in his youth, like Darwin, had been drawn to geology and he attended Darwin’s debut lecture in 1837 at the Geological Society when he talked about the coast of Chile and they met at William Buckland’s house in Oxford a few months later and talked all evening. In *Deucalion* Ruskin attacked Darwin, Huxley and Tyndall and defended the value of myth as being ‘“incomparably *truer*” than the Darwinian—or, I will add, any other conceivable materialistic theory’.[114] By 1883 Ruskin had accepted that natural selection might be possible but never accepted it was a full explanation.[115]

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[111] *ibid*., Vol. 20, 372-373, end notes 7-11.
[112] *ibid*., Vol. 22, 194-195.
[113] See *ibid*., Vol. 26, xx and Smith, *Charles Darwin and Victorian Visual Culture* (2009), pp. 277-79 and the letter to R.B. Litchfield, 1879, regarding Darwin’s visit to Coniston.
[114] Ruskin, *The Works of John Ruskin* (1903-12), Vol. 26, 336.
[115] Smith, *Charles Darwin and Victorian Visual Culture* (2009), p. 282.

In the first volume of *Modern Painters* in 1843, he proposed a radical anti-establishment view that criticized the Old Masters for failing to 'go to nature'.[116] However, as Ruskin wrote: 'The difficulty of reasoning on Beauty arises chiefly from the ambiguity of the word, which stands in different people's minds for totally different sensations.'[117] Ruskin demanded that artists learn to copy the intricacies of nature directly and not just follow a formula based on the Old Masters and his exemplar was J. M. W. Turner (1775-1851). According to his autobiography, Holman Hunt read Ruskin's *Modern Painters* before 1847 and the aims and techniques of the Pre-Raphaelite Brotherhood closely followed Ruskin's proposals.[118] For Ruskin nature was God's work and it was the task of the artist to subjugate himself to nature as an act of praise.[119] He also wrote: 'the primal object is to place the spectator, as far as art can do, in the scene represented'.[120]

Ruskin wrote a great deal on beauty and it is difficult to reduce his ideas to a simple formula. He made it clear in *Elements of Drawing* (1857) that an artist must begin by a thorough training in copying and representing nature. He realised that it is not possible to represent, for example, every leaf of a tree in the middle distance and so provided techniques for simplifying such forms.[121] However, he insisted that such techniques must enable the specific species to be identified rather than reduce all trees to the same simplified form. In the end though, he believed that great paintings can only be achieved by instinct and this can only be applied following rigorous study based on nature.[122] In *Modern Painters* Volume 2, for example, he decried mere copying or imitation and criticized the 'ditch-water' realism of the Dutch painters. He thought great art required great subjects in which higher spiritual and moral truths could be found and, as

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116 'Gaspar Poussin, more ignorant of truth than Claude, and almost as dead to beauty as Cuyp', Paul Crook, *Darwinism, War and History: The Debate over the Biology of War from the 'Origin of Species' to the First World War* (Cambridge: Cambridge University Press, 1994), p. 76, Ruskin, *Modern* (1843), p. 76.

117 Ruskin, *Modern* (1843), Part III, Section i, Chapter iii.

118 Holman Hunt, *Pre-Raphaelitism and the Pre-Raphaelite Brotherhood* (1905), p. 52. This is not intended to imply that Ruskin had a defining influence over the style of the Pre-Raphaelites. It appears that neither Rossetti nor Millais had read Ruskin before their first works were displayed at the Royal Academy or before Ruskin came out publicly in support of them, see Letter from John Ruskin to *The Times*, 'The Pre-Raffaellites', 13 May 1851, Letter from John Ruskin to *The Times*, 'The Pre-Raphaelite Artists', 30 May 1851 and a fuller discussion at George Landow, *"Your Good Influence on Me": The Correspondence of John Ruskin and William Holman Hunt* (The Victorian Web) <http://www.victorianweb.org/victorian/painting/whh/HRLet/introduction.html> [accessed 22 August 2012].

119 'That which ought to have been a witness to the omnipotence of God, has become an exhibition of the dexterity of man', Ruskin, *Modern* (1843), p. xxiv, preface to the second edition, *ibid*., preface to the second edition, *ibid*., preface to the second edition.

120 John Pollard Seddon, *Memoir and Letters of the Late Thomas Seddon, Artist* (New York: AMS Press, 1972), p. 171 quoted in Albert Boime, 'William Holman Hunt's "The Scapegoat": Rite of Forgiveness/Transference of Blame', *Art Bulletin,* 84:1 (2002), 94-114 (p. 105).

121 Ruskin, *The Works of John Ruskin* (1903-12), Vol. 15, 'The Elements of Drawing', 73-74.

122 *ibid*., Vol. 15, 'The Elements of Drawing', 210.

nature is the creation of God, faithful art is an act of praise and an uncovering of divine lessons.

As Darwin never toured France and Italy looking at art, except for a few weeks in Paris when he was eighteen, and as he could not draw he was always open to attack. However, he did look forward to visiting museums on his return from the *Beagle* although in the event he was too busy preparing publications. He read Reynolds's *Discourses* and took pleasure in the National Gallery and referred to a 'Salvator Rosa scene' when he wrote to Thomas Woolner from South America. He also later read the illustrated papers and scoured London print shops for works of art expressing emotions. It was a period during which there was a rapid increase in the use of illustrations in books and periodicals and Darwin used these new illustrative techniques to the full. His *Emotions* was the first scientific book to use photographic illustrations.

Darwin's work was frequently satirized in popular literature and even by Samuel Butler in his 1872 book *Erewhon*. The most prolific populariser of Darwin's work was Grant Allen who tried to make a living from popularizing scientific works including those of Darwin, Huxley, Spencer and Wallace. Wallace claimed that Allen stood at the head of living writers as a popular exponent of science and considered him knowledgeable enough to be original. Allen drew out the implications of Darwin's aesthetics in a way Darwin had not done and his book *Physiological Aesthetics* is discussed later. It was partially thanks to Allen, and other articles and popular works that Darwin was made available to those engaged in a serious discussion of art and beauty.

Grant Allen

Ruskin wrote: 'Why we receive pleasure from some forms and colours, and not from others, is no more to be asked or answered than why we like sugar and dislike wormwood.'[123] In *Physiological Aesthetics* (1877) Grant Allen (1848-1899) challenged Ruskin's assumption by investigating the basis of our experience of pleasure and pain and from this he built a theory of aesthetics. In this way, he could remove what he regarded as transcendental rhetoric and vague poetical declamations and arrive at a scientific theory. This could then be tested to demonstrate that likes and dislikes are the result of natural selection.

He did not aim to tackle fine art but the basic pleasures first as he thought that trying to deal with the complexities of fine art had been the downfall of other theories. He based his ideas on the work of Herbert Spencer (1820-1903), particularly, *Principles of Psychology* (1855), the work of Hermann von Helmholtz (1821-1894), particularly

[123] *ibid*., Vol. 3, 'Modern Painters 1', 109.

Handbuch der Physiologischen Optik (*Handbook of Physiological Optics*, 1867, not translated into English until 1924-5) and Alexander Bain (1818-1903) particularly *The Senses and the Intellect* (1855).

He started by separating emotions from the intellect and by treating emotions, including the aesthetic emotion, as arising from physical pleasure and pain. His aim was to show the purely physical basis of beauty and that all mental phenomena are the subjective side of objective nervous functions. Modern brain scanning that is used to investigate the sense of beauty makes the same assumption, that as we pin down subjective differences by relating them to measurable objective phenomena we gradually squeeze out the need to understand the subjective experience independently of the objective measurement. However, art appreciation deals with levels of metaphor and cultural association that are a long way from what brain scanning techniques can show us. On the other hand, they can give surprising results that can assist with even sophisticated aesthetic analysis through a better understanding of the brain processes that we have in common.

Unlike Darwin, who began with the question of why animals evolved their responses, Allen began with pain and he discussed a wide range of increasingly painful experiences from chapped lips to amputations and from candle burns to destruction with acid. He related all pain to the excitation of afferent nerves and explained that the reason pain may continue after the original source has been removed is because of the continued destruction of tissue and therefore excitation of the nerves. He included the pain associated with bright lights, loud sounds and certain strong tastes and explained them using the same theory of tissue wastage and therefore with the excitation of afferent nerves.

He tied this idea into Darwin's theory by explaining that the body has evolved to avoid damage to valuable organs and so pain is an experience that has evolved to cause us to avoid or remove ourselves from such damaging sources. He provided an extended metaphor of a locomotive that, if conscious, would experience pain at the loss of a piston or discomfort if short of coal or water. This equating of the mechanical with the animal reminds us of Paley's replicating watch and the ideas of assembly and disassembly in modern art explored by Linda Nochlin in *The Body in Pieces.*[124]

He related pleasure to the healthy functioning of any or all the organs of the body as long as this was not taken to excess. The strongest pleasures arise from the largest organs, such as the reproductive and alimentary and these give the greatest pleasure

[124] Linda Nochlin, *The Body in Pieces: The Fragment as a Metaphor of Modernity* (London: Thames & Hudson, 1994).

after the longest intermission. He pointed out that the greatest pain typically exceeds the greatest pleasure except for the 'sexual organs, where stimulation only takes place (in normal cases) after long intervals of rest'.[125] The weakest pleasures come from those organs that are most used such as sight and hearing and this he related to aesthetic feeling which he defined as the feeling we get when we exercise our eyes and ears for no ulterior life-serving object. Allen believed it is the business of art to combine as many as possible of the pleasurable sensations and exclude the painful to produce what he called the aesthetic thrill.

He believed the aesthetic experience was based on weak stimulation, subtlety and a cumulative effect. This explained why we do not normally consider objects, such as people we pass in the street, as beautiful or ugly because the aesthetic quality is only slightly marked and where pleasure is distinctly felt it is because the pleasure is cumulative. He explained the apparently objective nature of the aesthetic experience by positing that it results from the slow accumulation of pleasant, or painful, elements that can suddenly impinge on our consciousness, as if from outside ourselves.

His definition of the aesthetically beautiful was that which afforded 'the Maximum of Stimulation with the Minimum of Fatigue or Waste' and the aesthetically ugly was that which failed to do so.[126] In either case, the emotional element was weak and so it was perceived as an intellectual discrimination and we therefore have the idea that aesthetic feelings are noble and elevated because they are not associated with any life-saving function. They yield considerable pleasure and little pain because the eyes and ears are less associated with the disintegration of tissues.

Allen also linked his ideas to those of Kant through Alexander Bain (1818-1903) who stated that aesthetic feelings are disinterested and free from monopoly that is aesthetic objects can be enjoyed by a great number of people. Allen explained that a picture or a statue can be seen by millions, a great poem read by everyone that understands the language, a fine melody may spread around the world and anyone except a prisoner or a blind person may appreciate a sunset and the stars. As aesthetic feeling is cumulative it depends on many objects and so, he explained, it is difficult to define and can vary from person to person.

Allen believed that what had stopped all previous attempts to find a scientific treatment of aesthetics was the infinite variety of opinions on the subject of taste. It was, he believed, because aesthetic feelings are the cumulative effect of many infinitesimal physiological factors. The dependence on perception was demonstrated by the limiting

[125] Allen, *Physiological Aesthetics* (1877), p. 26.
[126] *ibid*., p. 39.

case—that a blind person cannot appreciate visible objects and a deaf person sounds and the colour blind cannot derive the same pleasure from tints. He gave many examples of differing tastes such as children not liking the strong taste of curry, musk being pleasant to some but overpowering to others and 'savages' and children liking a tom-tom or tin kettle that would annoy most civilized adults. He extended the examples to include the tutored dislike of monotony in music and the tutored preference for Bach to Offenbach and he wrote that although 'the vulgar' are pleased by masses of bright colour, the refined like delicate tints. He gave the examples of a watercolour by David Cox compared with the bright red and green of Egyptian wall painting and the scarlet and blue porcelain figures in a tap room compared with Gibson's tinted Venus.

He believed the vast majority of aesthetic pleasures and pains are the same for everyone otherwise art would be impossible. However, an artist, like a confectioner, can judge what will best please a particular public and he pointed out that there was scarcely a manufactured article that did not have an aesthetic finish. Allen's aim was not to explain the aesthetic feelings of a Raphael, a Mozart, or a Milton but that of the average human being. So he regarded his first step was to explain the liking for bright colours, easy melodies, and popular poems.

He did not believe that good and bad tastes are matters of convention but that coarse and indiscriminate taste was the starting point from which we learn to discriminate. He pointed out that aesthetic feeling is very faint but education can bring them out through the exercise of attention and by the growth of new intellectual and emotional associations. In addition, the aesthetically trained mind is full of associations such as a Cuyp meadow, a Sneyders still life, and a Reynolds head and therefore as Herbert Spencer says, 'every cognition is a recognition'.[127]

He wrote that 'true aesthetic arts' are more beautiful than nature as they gather all that is lovely and omit the ugly and the *Discobolus* or the *Medici Venus* are therefore more beautiful than any living nude figure and a landscape painting is lovelier than reality. With this, he positioned himself with those that see beauty as resulting from artistic genius and the ability to create beauty but Allen presented it as more mechanical than the result of genius, merely copying nature and omitting the ugly.

He went on to consider each sense in turn. For example, for sight he first considered the colour theories of Thomas Young (1773-1829) and Helmholtz and then the colours and combinations that bring us pleasure and pain. This he related to Darwin ideas:

[127] *ibid*., p. 52. The full quotation is 'In brief, a true cognition is possible only through an accompanying recognition', see Spencer, *First Principles* (1862), pp. 79-80.

> The rise of this liking for visual pleasure aroused by unusual stimulants shows itself in the sexual selection of beautiful mates which has produced the crest of the newt, the plumage of the Argus peasant, the peacock, or the bird of paradise, and the brilliant hues of the baboon; not to mention the cherry lips, rosy cheeks, blue eyes, and golden hair of our Aryan maidens.[128]

He mentioned Darwin, Hooker and Wallace in a footnote and added that he would like to emphasize the evolution of the eye to appreciate the colours, whereas they emphasize the colours evolving to attract the eye. In fact it was shown later than sexual selection involves the simultaneous evolution of the sense of discrimination (the 'eye') alongside the sexual characteristic (the 'colour') and Allen was right to draw attention to this distinction, although it was one that Darwin also pointed out.

Allen gave many examples of the reaction to colour based on Field's scale of Chromatic Equivalents and he mentioned the 'pungency' of gold and silver, the fatiguing effect of too much red, the attractiveness of scarlet or yellow turbans for Negresses, the attractiveness of the combination of green and gold and how the dress of a soldier by itself is hideously over-stimulating but is effective as one element in a landscape. Allen also agreed with Hogarth that an agreeable feeling accompanied graceful forms such as his line of grace and straight lines or following a rapid movement were both fatiguing.

He maintained that the love of order and symmetry was deeply seated in civilized man and gave examples such as the leaves of plants, flowers, star fish, sea anemones, molluscs, spiral shells, and even swans and deer. Whereas, amorphous creatures, like the oyster and slug and asymmetrical creatures like the sole and flounder, strike us with disgust. He wrote that the aesthetic value of a straight line was intellectual but it was tiring to examine a large rectangular object as flatness, monotony and uniformity were uncomfortable and we prefer porticos, arches and turrets in architecture as they allow the eye to wander. Allen referred to Spencer's essay on *Gracefulness* and Symonds *Miscellanies.*

Allen thought that although some art-critics maintained there is no beauty in symmetry and real art is unsymmetrical, we find symmetrical design used in every form of decoration. However, it was often out of place in any art that imitated nature except for components such as the leaf and flowers. Unsymmetrical leaves, like the begonia, please us only because of their singularity and we reject broken and imperfect leaves. He referred to Owen Jones's *Grammar of Ornament* for a comprehensive reference book of the decorative achieved through order and symmetry.

Allen also considered a higher class of 'nervous structures', known as the intellect. This was also subject to normal and moderate pleasurable exercise as well as

[128] Allen, *Physiological Aesthetics* (1877), p. 156.

abnormal and excessively painful exercise. He thought that intellectual pain was mostly fatigue from overuse but even perplexity, unless intensified by fear, was no more than discomfort. He pointed out that intellectual pleasure was frequent and arose from normal and healthy exercise and from the sudden successful performance of a previously baffling activity such as solving a mathematical problem or making a discovery that had previously eluded us.

Allen believed that although we can find intellectual pleasure in a factory or great city there is no aesthetic pleasure but if we visit a park, art gallery or cathedral our pleasure is aesthetic. This is because in the first case, the components may be beautiful or ugly and the information is useful or interesting but in the second case all the components are beautiful and the knowledge is disinterested. He concluded that to be aesthetic all the elements must be beautiful and it must be remote from ulterior aims. He followed Spencer in *Use and Beauty* by claiming that we may admire a steam engine but the parts are not beautiful as their purpose was utilitarian, but this was not the case with a classical building, which we can therefore find beautiful.

Allen also considered the ideal and noted that it is often connected with the anticipation of pleasure or pain. He contrasted children and 'savages' who live in the immediate present compared to 'man' who progresses in intelligence as he foresees with increasing vividness more and more distant pleasures and pains. In this way, for the 'intelligent man' there arises the idea of the happy life that is free from anxiety about the future and it is this happiness that is the end to which civilized man aims.

Allen discussed the imitative arts, which he did not think could be easily distinguished from the decorative. He saw the production of imitative art as the natural consequence of the need to occupy ourselves and fill time. So imitative art was connected with situations where we are prevented from following our normal activities and he gave the example of whittling a stick on a sea-voyage, cutting figures from paper and drawing pencil sketches, although he also included smoking, biting our nails and humming a tune as ways to pass the time. He believed that 'Under ordinary circumstances adult men have enough to occupy them' women of the upper classes do 'embroidery, wool-work, vitromanie, wood-carving, leather-moulding and a thousand other quasi-artistic expedients.'[129] Even 'savage man' will play with tools and materials and this gave rise to the earliest forms of art. Artistic feelings, according to Schiller and Spencer, had their origin in the play-instinct and a child will draw simple forms, which become engrained in the nervous system and are only slowly improved. The 'savage' remained at this conventional stage. The pleasure of art-production and art-perception

[129] *ibid*., p. 219.

grow side-by-side and as with the infant so with the early development of the race. Over time, Allen thought that artists would select for imitation only what was beautiful in nature but this would require many ages.

He separated the four kinds of pleasure painting may provide, the actual sensuous pleasure of form and colour, the ideal sensuous pleasure of softness, smoothness, warmth or comfort, the ideal emotional pleasure of various special sentiments and the intellectual pleasure of skilful imitation. To all of these was sometimes added the intellectual pleasure of plot-interest. For the actual sensuous pleasure, he said we expect the artist to choose beautifully shaped objects, such as the human figure, male or female, in graceful attitudes, nude and exquisitely formed, with rounded limbs, or clothed in flowing drapery, Greek or Roman, Oriental or Florentine. In addition, the artist should add animals like the fawn and swan, mountain peaks, winding bays, graceful pottery, domes, arches and so on. The artist should generally avoid the angular and harsh, shapeless animals, such as the bear, the cart-horse, the goose and the slug, and flat plains and still oceans.

He regarded religious sentiment as another plot-interest, which was appealed to formerly by gods and under Christian influence, by saints and martyrs. Similarly, our sense of pity gives us paintings that include such things as a blind beggar, a wounded soldier or a widowed bride. Also, love forms a main theme and patriotism gives us battle-pieces and ‘loyal demonstrations’.

The final category he described was the intellectual pleasure of skilful imitation and this he thought was felt by a child and by the uncritical public gratified by workmanship. An artist and art critic will appreciate all the technical issues involved, the gloss on satin, the bloom of a peach, spray from waves and so on, although only the artist can fully appreciate all these techniques. There is also the intellectual pleasure of plot-interest. A painting may represent a living action and tell its own story and there is much scope for artistic skill in the detail; and a small element, such as a drooping eyelid may make the picture’s fame. It is plot-interest that is the element most felt by the inartistic public and landscapes of marvellous detail and heads of ideal beauty are left to the admiring eyes of cognoscenti.

Allen discussed sculpture using the same four categories as he used for painting and actual sensuous pleasure he regarded as resulting from form not colour because it is difficult to attend to both colour and form and he thought beauty-of-form was a higher aesthetic feeling than that of colour and so the sacrifice of the lower pleasure of colour gives a gratification of unusual purity. He believed that one of the most marked symptoms of the late aesthetic regeneration in England was the revulsion from gaudy Parisian taste

in over-coloured and often ungainly vases to those of plain earthenware in exquisite shapes. He believed that like the swan compared to the peacock, sculpture depends for its purity on rigorous self-abnegation.

Allen considered that we derive more pleasure from the nude figure as the graceful natural outline was not masked by clothing and tinted statues, whatever may be said about Hellenic precedent, offended the average modern taste as they threatened the spectator with the 'obtrusion of non-aesthetic sentiments'. He pointed out that the coldness, hardness, and whiteness of marble limbs saved them from any suggestion of the lower feelings. He also thought that emotion could not be easily represented in sculpture as it depended on the use of colour. The intellectual pleasure of imitation was present in sculpture as in painting but whereas painting might show a deformed beggar, sculpture always aimed at an absolute ideal beauty of form.

The beauty of the face involves complex questions of sexual selection as described by Darwin (Chapter 19, *Descent*) and Allen believed the subject had been subject to much error in earlier treatises. Allen appeared to agree with the associationists and disagree with Darwin when he said that sufficient early training would enable us to prefer the figure of a baboon to that of the Apollo or the Aphrodite. He thought that the complexity of human beauty resulted from the way it combined all the elements of form, colour, symmetry as well as emotional, intellectual and ethical considerations and it was also affected by race, class, family, age, sex and individual peculiarities. On the other hand, he gave the example of how infants recognized expressions in others prior to all experience of their meaning and this proved that the experience must have a hereditary connection.

His explanation of racial beauty seems to be based on associationism as he points out that those who first mix with Africans find them ugly but as soon as the new standard is familiar those who best conform to its ideal form are recognized as handsome or pretty and European artists who have not lived in Africa sometimes try their hand at a negress but they always Aryanise the type and so produce a mere sickly sentimentality. He believed we must make allowance for our own ideas of beauty remembering such ideas may be engrained in the nervous system of each race. He referred to Spencer's discussion of this issue in *Personal Beauty* and he made the Darwinian point that sexual selection may have ensured that those who bear the outward signs of being the most desirable parents will best please the opposite sex.

George Frederic Watts

George Frederic Watts (1817-1904) was twenty when Victoria came to the throne and survived her by three years. He was a prolific artist who enrolled at the Royal Academy

when he was eighteen and continued working until a few months before his death. He was the nineteenth-century British artist who was most influenced by Darwin's ideas, which from the 1870s he increasingly tried to incorporate within a symbolic vision that balanced progress and power against chaos and humility. Extremely well known and popular when alive he suffered a rapid decline and was satirised by Virginia Woolf and lampooned by Wilfred Blunt as 'England's Michelangelo'.[130] His work however, can be re-interpreted not as a grand attempt to synthesize science and art but as a chaotic struggle to incorporate conflicting cultural assumptions.

In 1880 Watts published an article entitled 'The Present Condition of Art' in which he examined whether a 'great school of art is possible in the present day'.[131] The article is not primarily concerned with a theory of beauty but it decries the lack of beauty in the modern world. It is interesting as although it could be dismissed as reactionary it can be seen as signalling a divergence between beauty and art. For most of the Victorian period, it was taken for granted that a primary role for artists was to create something beautiful.

Charles Baudelaire (1821-1867), like Watts, pointed out that an artist works within and represents the fashion and culture of the age. Baudelaire wrote that 'Beauty is made up of an eternal, invariable element, whose quality it is excessively difficult to determine, and of a relative, circumstantial element, which will be, if you like, whether severally or all at once, the age, its fashions, its morals, its emotions.'[132] The second part of Baudelaire's definition of beauty has been seen by many to be reflected in the Impressionists representation of cityscapes and industrial sites, such as railway stations. However, this is interpreting his statement very narrowly, as he was making a much broader point about beauty. In addition, the modern world had been represented earlier, in such works as Turner's *Rain, Steam and Speed* (1844) and so this element of the idea was not novel. What Baudelaire was defining was that art should consist of an object or scene to be represented, typically of the period, but also a quality that is absolute, eternal and difficult to define, the beauty with which the modern world is imbued in that particular artwork.

What Baudelaire was representing was an established view of a metaphysical and absolute beauty, which he combined with a relative element, the subject matter itself. Watts was writing at a time when the idea of absolute beauty was losing ground to Darwin's idea of relative beauty. Watts was aware of the lack of interest in beauty but he

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[130] Virginia Woolf's play was *Freshwater* and Wilfrid Blunt, brother of Anthony Blunt, was the curator of the Watts Gallery from 1959 to 1983.

[131] George Frederic Watts, 'The Present Condition of Art', *Nineteenth Century: A Monthly Review,* 7:36 (February, 1880), 235-55.

[132] Baudelaire, *The Painter of Modern Life and Other Essays* (1995, first published 1863), p. 3. In France, other leading writers on aesthetics include Théophile Gautier (1811-1872) and Victor Cousin (1792-1867).

failed to find an alternative as he still regarded beauty as an essential aspect of art. He did not doubt the artists but thought that a school could not be established when there was so little he regarded as beautiful in the culture. Five years later Whistler resolved the problem by describing how the lone artistic genius can create beauty in a half-seen, crepuscular or night-time world. Many other artists, such as Burne-Jones and Rossetti create their own world of knights and maidens, and Watts also created his own world but of myths and symbolism. All these artist were reacting in different ways to the changing cultural landscape and the changes had been brought about partly by new scientific ideas whose popularization had profound consequences for established views.

He understood that for a great school of art to be possible a group of like-minded artistic geniuses had to form a school with a common style that would become part of the history of the country. His article was an expression of his disappointment and regret regarding the decline in all forms of art that had been brought about, he claimed, by increased industrialization, the desire to maximize profits and the consequent lack of decoration and the lack of any general education in the visual arts. In particular, he found that 'one of the most striking points of difference between ancient or medieval and modern life' was the failure to decorate 'almost all objects of daily use.'[133] In this type of society he did not think that any artist could 'rival the productions of the men [...] of past ages' and believed we do not want beauty for its own sake because the section of society that represents progress saw it as a trifle.[134] Art was regarded as a plaything and although the young were encouraged to take up art the artist who 'should speak the language of his time' could not, he thought, create beauty in a world of ugliness.[135]

Watts believed that there had been progress and that Britain for him represented a peak but he also realised that progress is not guaranteed and he could foresee a time when warfare may have ended but England may by then have become a 'mass of unsightly shells of uninhabited buildings, a hideous network of unused railways'.[136] Watts was also never a conventional Christian and he believed 'peace and goodwill' should be the most important principles of the Christian Church and he thought these had been ignored in favour of the 'dread of punishment' and religious dogma.[137] 'Natural religion' had become antagonistic to revealed religion which had the 'fatal result of developing a materialistic tendency' and this has 'sapped all beauty' out of modern social habits.[138]

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[133] Watts, 'Present', *Nineteenth Century: A Monthly Review,* 7:36 (February, 1880), 235-55 (p. 236).
[134] *ibid*., p. 235.
[135] *ibid*., p. 240.
[136] *ibid*., p. 244.
[137] *ibid*., p. 215.
[138] *ibid*., pp. 245-46.

Watts had a socialist view that wealth should be used for the general good and the 'hand-worker' should be given pleasurable work and encouraged to do it well.[139] He thought that we might not then be able to compete with some nations in material conditions but by appreciating the hand-workers labour 'a possible Utopia is discerned.'[140] As in William Morris's *News from Nowhere* (1890) the utopian future is one of healthy people living in a socialist society where beauty is created through the society valuing creative and pleasurable work and the resulting hand-made decorative objects. Everyone would, in their utopian future, become in a sense, an artist because all work would involve the creation of beauty. However, the idea of Darwinian relative beauty had already started to undermine these utopian dreams. Other Socialist thinkers would regard work as a necessary evil and their aim would be to reduce the amount of work and distribute its results fairly.

James McNeill Whistler

Whistler's Ten O'clock Lecture was not given until 20 February 1885 in Prince's Hall, Piccadilly but we know it represented views he had held for many years as we find them expressed in his correspondence and the pamphlet he wrote following the Ruskin *v*. Whistler trial of 1878.

Whistler theory of beauty is in the Romantic tradition as he emphasized the role of the artistic genius who alone can create or even recognize beauty. Whistler's career was one of isolation partly because of racial prejudice; he was an American in Britain trying to deal with the art establishment. This isolation was demonstrated by the refusal of his fellow artists, apart from Albert Moore, to testify on his behalf at the Ruskin trial and by the way he was ignored by patrons for many years. Whatever his personal views his approach to beauty reflected a view that goes back to the Greeks, that beauty comes from the inspiration of an artistic genius.

Whistler's lecture was well attended by high society as by this stage Whistler had become notorious. He was known as an entertaining personality that he had self-fashioned over the years, particularly following his trial. The lecture was essentially about the artist, art and the production of beauty. Beauty had become the sole attribute of the art of leading edge artists, what could be called an English avant-garde. Whistler was looking for what was central to painting that distinguished it from other arts, such as literature. This was visual beauty as its other qualities, such as its ability to tell a story or make a moral point where better done by literature.

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[139] *ibid*., p. 247.
[140] *ibid*.

Whistler made it clear that beauty resulted from artistic genius and it was foolish to go to nature to find beauty. He wrote:

> How little this is understood, and how dutifully the casual in Nature, is accepted as sublime, may be gathered from the unlimited admiration, daily produced, by a very foolish sunset.

The artist produces beauty by bringing together the necessary elements from nature like a pianist at a keyboard (see page 99).

In the most moving and poetic passage he starts by denigrating the 'delight in detail' resulting from the 'desire to see, for the sake of seeing'. He continued:

> when the evening mist clothes the riverside with poetry, as with a veil – and the poor buildings lose themselves in the dim sky – and the tall chimneys become campanile – and the warehouses are palaces in the night – and the whole city hangs in the heavens, and fairyland is before us – then the wayfarer hastens home – the working man and the cultured one – the wise man and the one of pleasure – cease to understand, as they have ceased to see – and Nature, who for once, has sung in tune, sings her exquisite song to the Artist alone

He continued by raising the artist even further, he wrote:

> that the artist is 'Set apart by them [the Gods] to complete their works, he produces that wondrous thing called the masterpiece, which surpasses in perfection, all that they have contrived in what is called Nature, and the Gods stand by, and marvel – and perceive how far away more beautiful is the Venus of Melos, than was their own Eve'

He was even opposed to people who write about art, he called them 'the unattached writer' and thought they had widened the gulf between 'the people and the painter' and brought about a complete misunderstanding resulting from viewing the painting as a literary work, a hieroglyph to be deciphered. He thought this degraded art as it presents it merely as a means of bringing about a literary climax.

He also believed that art has nothing to do with education and the implication of this is that you are a born artist, or in other words, he completely disagreed with the ideas of associationism. He wrote: 'So Art has become foolishly confounded with education – that all should be equally qualified.' This also implied, as he pointed out, that many people, even the 'most finished scholar or greatest gentleman in the land' may have no 'eye for painting', which should be admitted, as it is no 'proof of inferiority.'

He went on to explain that art is not the product of a period but expresses an eternal truth, like science, and as art is limited to the infinite it cannot therefore progress. This also implies that he saw no decadence in art, 'It is false this teaching of decay.' He also denied the link often made, for example by Ruskin, between 'the grandeur of Art, and the glories and virtues of the State' as Whistler puts it. He gave examples of the whimsical nature and capriciousness of art by contrasting the worthy Swiss upon whom Art has turned her back compared to the opium eaters of the East whose blue porcelain

she loves. Finally, Whistler wrote that there are very few Masters (a titled he insisted everyone who knew him used) and when they die, art will leave the land except for the afterglow of the memory of the great man.

One interpretation of Whistler's lecture in modern marketing terms was that its objective was to position Whistler as a low-risk investment with a high return even though he was not endorsed by the mainstream art establishment. Increasingly art was seen by businessmen as a financial investment but for the investor it was a high risk as there was no guarantee that the artist would continue to improve their reputation with the consequent increase in the price of their work. Rarity would help increase the prices and so the death of an artist was often associated with a retrospective review and an increase in prices. The safest investment had been to buy the works of Royal Academicians but as the prestige of the Royal Academy fell this guarantee became worth less. The other way to judge an artist was having their work exhibited and to have a favourable response from the established art critics. Finally, some artists, such as Rossetti, had a reputation through word of mouth and fashionable society. Whistler played to all these factors in his lecture as essentially he said the endorsement by the art establishment was no way to judge an artist, critics and other writers can be ignored and an artist cannot even be judged by society as many people have no eye for art. He claimed there are very few great artists and they are born artists and can be recognized by being called Master. Finally, the proof that Whistler was himself a Master was the crowded lecture hall full of well-known names in society who would be the potential buyers who would drive up the prices.

However, what does his lecture tell us about beauty and its role in the cultural paradigms of the 1890s? Whistler was essentially reinforcing Pater's view of the relativism of judgements concerning art and beauty. The old certainties surrounding an absolute measure of art based on sound principles taught by the art establishment were gone as were the old certainties associated with critics, such as Ruskin, who built upon the beauty of a divinely created natural world accurately represented by an imaginative artist. Also gone was the association between great art and a great nation like Britain with its worldwide empire. As Pater pointed out a primary cause for this change was Darwin's ideas as he showed that human beings are simply another species of animal with differences but with no absolute and certainly no divine distinction.

Oscar Wilde

Oscar Wilde started his lecture tour of America the year that Darwin died. Wilde's first lecture was called 'The English Renaissance' and it provides an excellent summary of contemporary views on beauty and their relationship with science. He said that he would take a practical approach by explaining beauty through the work of the most recent

English art movement rather than provide an abstract definition 'as was sought for by the philosophy of the eighteenth century'.[141] This approach is analogous to the scientific method where the emphasis is on observing the natural world rather than trying to formulate a general theory through thought alone.

He described the latest English developments as like a rebirth of the classical in terms of its 'passion for physical beauty' and 'exclusive attention to form'. But he saw that the classical had been combined with the romantic which he described as concerned with the temporary, the transient and the exception which are associated with 'the progress and movement and social life of the age'. He saw the art movement resulting from the French Revolution but added that 'neither in politics nor in nature are there revolutions ever but evolutions only'. The idea that evolution was a more powerful force for historic change than revolution was explained by pointing out that the path to the French Revolution was paved by a critical spirit in Germany and England, which required everything to be tested against reason or utility. This 'scientific tendency' had influenced the artistic spirit by encouraging close observation and clearness of vision. Clearness of vision he linked to a 'distinct, sharp and defined boundary line', which resulted in perfection in art.

He went on to make a distinction between noble and realistic artists who loved the earth itself and 'a definite conception' as opposed to those colourless and empty abstractions of the eighteenth-century poets, the vague spiritualities of the German school and that this spirit of transcendentalism was opposed to the spirit of art. In the former school were Homer, Dante, Keats and William Morris. These artists he associated with the 'materialism and positiveness of our day' and this linked them to science and, although not specifically mentioned by Wilde, to the most famous scientist of the day, Darwin.

Summary

It can be seen that the theories divided between those based on a philosophical approach and those that took beauty as a divinely created attribute whose properties could be analysed but whose origin was given. Darwin's ideas regarding beauty were therefore controversial as they were neither philosophical nor religious.

Did Darwin's theory imply a rejection of Immanuel Kant's (1724-1804) idea of disinterested beauty? It could be argued that the beauty associated with sexual traits is not contemplative but is always concerned with satisfying an appetite. On the other hand,

[141] Oscar Wilde, 'The English Renaissance of Art' (lecture given in 1882) from which all the quotations are taken.

Darwin described a mechanism of recognition, which placed beauty in the eye of the observer not in the object contemplated.[142] Our common ancestry also creates a shared feeling between different observers, which provides a physical basis for a universal notion of beauty.

Darwin's statement reflects some of the ideas described by Kant in *Critique of Judgement*. Kant maintained that 'There can be no objective rules of taste' and that 'beauty for which an ideal has to be sought cannot be a beauty that is *free and at large*.'[143] When he was young, Reynolds appears to have believed that beauty is relative as he wrote:

> Among the various reasons, why we prefer one part of nature's works to another, the most general, I believe, is habit and custom; custom makes, in a certain sense, white black, and black white; it is custom alone determines our preference of the color of the Europeans to the Ethiopians, and they, for the same reason, prefer their own color to ours. I suppose nobody will doubt, if one of their painters were to paint the goddess of beauty, but that he would represent her black, with thick lips, flat nose, and woolly hair; and it seems to me, he would act very unnaturally if he did not; for by what criterion will any one dispute the propriety of his idea? We indeed say, that the form and color of the European are preferable to those of the Ethiopian; but I know of no other reason we have for it, but that we are more accustomed to it.
>
> The black and white nations must in respect of beauty be considered as of different kinds at least a different species of the same kind from one of which to the other as I observed no inference can be drawn.[144]

However, later, in his *Discourses*, Reynolds wrote:

> the idea of beauty in each species of beings is invariably one, it may be objected that in every particular species there are various central forms, which are separate and distinct from each other, and yet are undeniably beautiful [...] For perfect beauty in any species must combine all the characters which are beautiful in that species.'[145]

It can be assumed from this that Reynolds regarded black and white people as separate species, each with its own form of perfect beauty. However, his earlier insistence that beauty is relative to the extent that custom can make white black and black white suggests he might have changed his views over the eleven intervening years.

As we saw, Darwin wrote: 'it does not explain the feeling in any one man', which implies he was looking for a testable hypothesis regarding how and why such a feeling developed. He was interested in the way in which the feeling of what is beautiful arose in each individual. The need to consider the individual rather than the class, type or species

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[142] In the twentieth century, mathematical modelling has shown that sexual selection only operates because the trait and the appreciation of the trait are both inherited and it is also necessary for a proportion of the population to share the appreciation of the trait.

[143] Original emphasis, Kant, *Critique of Judgement* (2007), pp. 62-63.

[144] Reynolds, 'The Idea of Beauty', *The Idler,* 82 (10 November, 1759) (pp. 239-41), 'To the Idler'. 10 November, 1759.

[145] Reynolds, *Discourses* (1778), p. 80, 82, 'Discourse 3', 14 December 1770.

is a powerful theme that occurs throughout Darwin's work, including his ideas regarding beauty.[146] This focus on the individual enabled Darwin to deal with beauty without the need to invoke an ideal. Each individual is empowered to recognize the beautiful because of the vast sequence of selections made by their ancestors and we often agree on what is beautiful because of our shared ancestry not because of a metaphysical ideal we share. This can be seen as the biological basis for Kant's observation that the judgement of beauty is a universal. The universal nature of beauty according to Kant arises because he defines our appreciation of beauty as disinterested, that is, if an individual's wants and needs form any part of their judgement then it is not free beauty. However, Kant argues that our sense of beauty is subjective, perhaps because it would otherwise raise the question of where does an objective beauty come from, which would undermine his refutation of the Argument from Design as one of the proofs of God. Darwin provides a mechanism for objective beauty without the requirement for divine creation but based on a theory that is concerned with the individual.

In his notebook, Darwin discussed the beauty we find in a natural scene which he makes clear is a modern phenomenon. Although not mentioned by Darwin, his point is reinforced by the fact that the creation of paintings of landscape not as a setting for a biblical or mythological scene but as an end in themselves started in the early sixteenth century with artists such as Albrecht Altdorfer (c. 1480-1538) and Albrecht Dürer (1471-1528). It is arguable that other periods also saw beauty in outdoor scenes, such as Roman villa frescoes of landscapes and gardens, but at other times, landscape was only used as a background if at all. Some recent writers, such as Denis Dutton have argued against Darwin's view by speculating that the appreciation of landscape is derived from an instinct acquired through natural selection during the Pleistocene period (2.6 million to 12,000 years ago).[147]

Darwin struggled with the question of the universal nature of beauty when he slipped into assumptions concerning cultural progress. In *Descent*, he wrote:

> We thus see how widely the different races of man differ in their taste for the beautiful. In every nation sufficiently advanced to have made effigies of their gods or of their deified rulers, the sculptors no doubt have endeavoured to express their highest ideal of beauty and grandeur. Under this point of view it is well to compare in our mind the Jupiter or Apollo of the Greeks with the Egyptian or Assyrian statues; and these with the hideous bas-reliefs on the ruined buildings of Central America.[148]

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[146] At this point, I am using the terms synonymously to mean a type of a particular set of individual animals or plants. In taxonomy, there is a hierarchy of classification, which is broadly Kingdom, Phylum, Class, Order, Family, Genus, Species, but I am not using class in this sense.
[147] Dutton, *The Art Instinct: Beauty, Pleasure, & Human Evolution* (2009), pp. 13-28.
[148] Darwin, *Descent*, 1st edn (1871), II, pp. 348-50

He is arguing that beauty is a relative, not an absolute concept but the use of the words 'advanced' and 'hideous' suggests he was making a value judgement based on an assumption of cultural progress. This highlights a tension that runs through all of his writing between scientific observation and Victorian values. He seems to be saying that beauty is relative to each race but as the most highly developed race we can look down on the beauty of other cultures as 'hideous'. He also assumes that the races mentioned were trying to represent their gods or deified rulers using the 'highest ideal of beauty or grandeur'. There are many other uses for such representations; for example, the Egyptians may have been representing them in a stylized way to show the continuity of ancestry. The unusual break from tradition in the reign of Akhenaton and the later return to tradition suggests that their art was involved in a complex debate between representation and tradition.

This conflict between relative and absolute ideas of beauty is often linked in the Western tradition to classical art as a supreme achievement, but the re-evaluation of 'primitive' art by a number of artists influenced by Oriental culture and Japanese art as well as John Ruskin's (1819-1900) valorization of the Gothic led some artists away from the classical tradition. The conflict in Darwin's writing between racial diversity, as indicated for example by the arbitrary distribution of traits, and the view that some races are more highly evolved than others runs through his work. This conflict also shows itself in art between the search for an ideal beauty and the general re-evaluation of 'primitive' art.[149] Darwin's view was therefore that some forms of beauty are culturally dependent, some result from human sexual selection, which can vary from culture to culture, and some are based on our shared ancestry and our evolved and shared appreciation of symmetry and proportion. Which forms of beauty are shared by all humans and which are culturally dependent is not easily separated because as Matt Ridley has pointed out in *The Red Queen* (1993) the distinction between nature and nurture is not an either-or distinction.[150]

Our evolved natures give us a predisposition to take an interest in certain things that our culture can manipulate in many different ways. For example, young children have a predisposition to learn language, this desire to communicate cannot be taught, but it leads to many languages with different vocabularies and grammars. If we try to find the common elements between all these languages, we are often reduced to predispositions rather than features. The common elements can be appreciated through the mistakes made. The ease with which a child learns the word 'rabbit' suggests it is predisposed to

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[149] The reaction to foreign art was mixed; the excitement artists felt towards the value of Japanese art can be contrasted with the perception of Middle Eastern art as mysterious and 'Other'. See Said, *Orientalism: Western Conceptions of the Orient* (1995).

[150] Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (1994).

know the word refers to a certain section of the perceived stimulus and this suggests it is shared by all humans. A child rarely makes the mistake of using the word to refer to the rabbits colour, or to all four-legged animals, or to hopping, or to pets in general.[151] All humans appear to sub-divide the world in similar ways suggesting that this ability is an evolved predisposition or instinct.

Of course, mistakes are made, particularly with words that are more complex; consider the complications of trying to understand what is meant by the word 'beauty'.[152] In addition, even simple words, such as 'chair' collapse under the weight of borderline cases. Is a chair with no back still a chair; is a kneeling chair a chair and when does a stool become a chair? Are these simply a question of definition or do they highlight the fact that meaning is constructed through language games?[153] Language is enriched with metaphor and this adds hidden cultural assumptions to everything except the simplest statements. This last point is particularly relevant to misunderstandings concerning Darwin's theory of evolution, as it is almost impossible to avoid words associated with progress, purpose and intention.

With Darwin's publication of *Origin* the topic of sex and the roles of each gender were legitimized for a much wider range of articles and conversations. At first glance, Darwin's work appears to reinforce the status quo; for example, in *Descent*, in just two pages he describes men compared with women as taller, stronger, more courageous, more energetic and with a more inventive genius.[154] However, further on in the same section he clearly runs into great difficulties regarding the fundamental question of gender selection. In most animals, the female selects the male or the males fight for control of the females and the mechanism can be determined by the particular sexual characteristics. In humans, there is a confusing mixture of characteristics such as male weapons, male sexual characteristics and female sexual characteristics. He wrote: 'women have more power in choosing, rejecting, and tempting their lovers, or of

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[151] This view of language was first developed by Noam Chomsky in Noam Chomsky, *Syntactic Structures* (The Hague: Mouton, 1957) and more recent advocates include Pinker, *The Language Instinct: How the Mind Creates Language* (1994). The opposite view is taken by some philosophers, see the discussion of the utterance 'gavagai' applied to the sighting of a rabbit in Quine, *Word and Object* (1960), pp. 29-57. It has been found that zebra finches raised in isolation will, over several generations, produce a song similar to that sung by the species in the wild, see 'Birds Raised In Complete Isolation Evolve 'Normal' Species Song Over Generations', *ScienceDaily*, 4 May 2009, <http://www.sciencedaily.com/releases/2009/05/090503132617.htm> [accessed 22 August 2012].

[152] See the discussion of what we mean by the word 'game' in Wittgenstein, *Philosophical Investigations* (1972), pp. 31-34.

[153] 'Fuzzy borders' understates the complexity of the problem, a better analogy is to think of communication as a language game, see *ibid*., p. 39.

[154] Darwin, *Descent*, 1st edn (1871), II, pp. 621-22.

afterwards changing their husbands, than might have been expected.'[155] He also posited a double selection, where the more attractive men prefer, and were preferred by, the more attractive women. One consequence is that the attractiveness of men is therefore an important aspect of their masculinity and this implies that women select men. During this period men became beautiful objects for visual enjoyment as is shown in the renewed interest in Greek sculpture, in neo-classical themes in art and in the male Aesthetes themselves and their attention to personal appearance.

[155] *ibid*., p. 666.

Appendix 4: Glossary

The following terms are provided for those not familiar with the terminology of genetics.

Allelle, one of several different forms of a gene, now understood to be a particular DNA sequence at a particular location. For example, in the ABO blood group system the O allele differs from the A allele by the deletion of a single guanine ('G') nucleotide.

Amino acid, the building blocks of proteins, in other words proteins consist of a sequence of amino acids.

Bright male hypothesis, certain characteristics, such a bright colours, indicate health and therefore selection on the basis of colour is actually selecting the healthiest male. This implies that sexual selection may, in this case, actually be natural selection as the healthiest male is more likely to survive.

Classical Darwinism, regards the individual or the group as the basic unit of selection, see modern Darwinism.

Chromosome, a single piece of coiled DNA containing many genes and other elements. A single chromosome may contain 10,000 to a billion bases (the 'letters' of the genetic code, A, G, C, T) and humans have two sets of twenty-three chromosomes and one of these can take two forms, the so called X and Y chromosomes. If one of the chromosomes is a Y chromosome then the organism is a male.

Codon, a sequence of three DNA bases that encode a particular amino acid. As there are four bases (A, C, G, T) there are sixty-four possible combinations although not all code an amino acid and some combinations result in the same amino acid. There are twenty different amino acids coded by the codon triplets. All life investigated so far uses the same coding language, with small variations, which suggests that all life arose from a common ancestor.

Crossover is the mechanism that creates a rearranged chromosome and therefore genetic variability. Two similar chromosomes cross over at one or two points and two new chromosome are created consisting of the genes from alternate chromosomes. In humans, it results in some of the genes being taken from the mother and some from the father for each of the twenty-three chromosomes.

Darwinism, originally it was the beliefs and theories of a group of people promoting a paradigm change based on Darwin's theory of natural selection. Later the term expanded to include a wide range of social and political ideas. Many of Darwin's supporters held views that differed from those of Darwin, for example, Wallace thought that the creation of man was an exception to the theory.

Diploid, organisms that have two complete sets of chromosomes in each cell. Cells with one copy of each chromosome, such as sperm and egg cells, are called haploid.

DNA, deoxyribonucleic acid is a molecule shaped like a double helix consisting of two intertwined spirals ladders made up of four types of nucleobases (informally, 'bases') known by the abbreviations A (adenine), G (guanine), C (cytosine) and T (thiamine). Chemically, 'A' bonds only to 'T' and 'C' only to 'G' so the two intertwined spirals are mirror copies of each other. Each copy contains all four bases. Bases are grouped into codons, which code for particular amino acids. A long group of codons makes up a gene and each gene codes for a particular protein (a sequence of amino acids). The reading and translation of genes into proteins is carried out through the intermediary of messenger RNA and the process is analogous to the way a chef mixes ingredients in a certain order to make a cake rather than the way a computer program is executed. All living things, with the exception of RNA viruses, encode the instructions for building and maintaining themselves in DNA.

Dominant, in a diploid individual there are two chromosomes and the particular form of a gene (allele) at a particular location (locus) on each chromosome can be the same or different. If they are different then the allele that determines the phenotype (trait) is described as dominant and the other recessive. In practice, it can be a lot more complex with co-dominance (both alleles contribute to the phenotype), semi-dominance and multiple alleles with a series of interrelated effects (such as human blood groups). Also, see epistasis.

Epigenetic, refers to changes in the phenotype (appearance) caused by differences other than a change in the genes. An accepted example is cell differentiation, once, for example, a muscle cell is produced it will only divide into new muscle cells. However, the term is used to describe a Lamarckian mechanism that breaks the Weismann barrier. One possible mechanism for this is methylation but the influence only lasts for one or two generations.

Epistasis, a phenotype, such as flower colour can be the result of the interaction of alleles at more than one location (locus), for example, one location can determine pigment colour and another whether the pigment is produced.

Eukaryotes, organisms with cells that contain a nucleus and typically other structures such as mitochondria or chloroplasts.

Extended phenotype, the expression of a gene or genes that includes not just the organism but associated organisms and objects, for example, the bower birds' courtship construction is part of its extended phenotype.

Gene, is the basic unit of heredity. It is a sequence of DNA that typically contains a coding and a non-coding region and the coding regions are copied by a process called transcription to produce proteins. Genes that code for proteins are composed of sequences of three DNA bases, called codons, which serve as the words in the genetic language.

Genetic drift, the process whereby a trait can dominate or be lost in a small population as a result of random chance. The alleles (particular genes) in an offspring are a random sample of those in the parents and so in a small population the percentage of that allele in the population might increase or decrease over time through chance selection.

Genotype, the genetic make-up of a cell or organism (the specific collection of alleles).

Good genes hypothesis, proposes that females select traits because they are indicators of male quality and overall health. It has been found that female sticklebacks prefer males with bright red bellies and there is a correlation between red bellies and resistance to parasitic worms so females might be choosing parasite resistance rather than beauty. See handicap hypothesis.

Group selection, a mechanism that enables alleles to spread because of the benefit they bring to the group rather than the individual, such as an apparent human predisposition to engage in genocidal warfare. Group selection is now largely discredited but has gone through a number of revivals, for example, Sober and Wilson's work on trait groups.

Handicap hypothesis, if a male can survive until reproduction with a maladaptive trait, such as a long tail, it is an indication of its health. The trait is known as a marker as it signals the health of the organism and because it is genuinely bears a high cost in terms of additional food required, visibility to predators and reduced mobility it cannot be faked. If a male is able to bear this cost and remain healthy

then it can be argued that the trait is a true fitness indicator and that females are selecting for fitness rather than beauty. The idea was proposed by Amotz Zahavi in 1975.

Horizontal gene transfer, any mechanism that results in genetic material being passed to another organism that is not its offspring. It takes place between single-cell organisms without a nucleus (prokaryotes) and between single cells with a nucleus (eukaryotes) but it is not clear if it plays a role in multicellular eukaryotes. It enables, for example, antibiotic resistance to be shared between different species of bacteria.

Lamarckian evolution, the idea that a trait developed or strengthened during the lifetime of an individual can be passed to its offspring. There is no proven mechanism whereby the traits of an organism can be translated back into changes in its DNA (but see Methylation below). This is known as the Weismann Barrier.

Meiosis is a special form of cell division. In humans, one cell divides not into two but into four cells each with only one set of chromosomes. These cells are called gametes and in all animals and land plants, they are the egg and sperm cells. It is during meiosis that is during the creation of the eggs and sperm cells that genetic material is rearranged between chromosomes from the father and mother, using crossover. During fertilization, each gamete contributes half of its chromosomes to create the new individual.

Mitosis, in humans is normal cell division in which a cell divides into two, each with identical pairs of chromosomes, one from the father and one from the mother.

Modern Darwinism, regards the gene as the basic unit of selection, Richard Dawkins's *The Selfish Gene* is a key popular description. In most cases, classical and modern Darwinism will give the same predictions.

Modern evolutionary synthesis, the union of natural selection and Mendelian genetics. The term was produced by Julian Huxley in his book *Evolution: The Modern Synthesis* (1942).

Methylation is when a methyl group ($-CH_3$) attaches itself to parts of the DNA and it is essential for normal development as it is part of stem cell differentiation. There is a mechanism (methyltransferase) that replicates the exact methylation of the parent DNA strand to the daughter strand. Recent research suggests this may be linked to memory storage in the brain. Methylation could also result in a limited form of Lamarckian evolution as changes made during an organism's lifetime

could be transferred to the offspring. This is still a controversial area of current research.

Mutation is a random change to the genetic sequence caused by, for example, radiation, chemicals or a virus. Typically, mutation has either no effect or a deleterious effect. Genetic variability usually arises from crossover, not mutation.

Natural selection is today often used in a way that includes sexual selection. Darwin treated natural selection and sexual selection separately.

Neo-Darwinism, the modern synthesis of Darwin's theories with Mendelian genetics. Neo-Darwinism rejects Darwin's idea of pangenesis and all of his writing that implies Lamarckian inheritance, see Darwinism.

Nucleotide or base, the structural units of DNA and RNA, consisting of adenine (A), thymine (T), guanine (G), cytosine (C). 'A' forms what is called a 'base pair' with 'T' and 'G' with 'C'. In RNA, thymine is replaced by uracil (U). Each group of three nucleotides forms a codon.

Ornament, a sexual characteristic that one sex, generally the male, uses to attract a member of the opposite sex for sexual intercourse, for example, the peacock's train. See weapon.

Pangenesis, Darwin's theory of how inheritable characteristics are passed to offspring. Darwin thought that gemmules or pangenes were shed by organs of the body and accumulated in the germ cells (gametes, the sperm and egg cells). Pangenesis provides a mechanism for Lamarckian evolution but Darwin pointed out that gemmules could also be changed by the external environment. Galton set out to prove Darwin right with a series of experiments on rabbits but instead proved him wrong. Galton had transferred blood between rabbits thinking it would contain gemmules (which he called pangenes) but Darwin later denied the validity of the experiment as he had never claimed gemmules were in the blood or if they were then only for a short time.

Parthenogenesis, asexual reproduction where the female gives birth to a viable offspring without fertilization from a male. The offspring of XY sex-determined species are always females and it takes place in fleas, aphids, some bees, and some reptiles, fish and very rarely birds and sharks. Note that this differs from hermaphroditic reproduction as hermaphrodites contain the reproductive organs of both sexes. There are many forms it can take and offspring can be genetically distinct. Egg cells may be reproduced by cell division in which the number of chromosomes is

halved (meiosis) or by the cell dividing into identical cells (mitosis) and the egg may contain a single set of chromosomes (haploid, humans have twenty-three chromosomes in the egg and sperm cells) or two copies of each chromosome (diploid, humans have forty-six chromosomes in other cells). Richard Owen published *Parthenogenesis* in 1849 as an introduction to his Hunterian lecture.

Phenotype, any observable characteristic or trait of an organism. It results from the expression of an organism's genes as well as the influence of the environment.

Protein, the basic building blocks of the body, they participate in virtually every process within every cell. They make up skeleton, muscle, and carry out signalling, cell process and act as enzymes (catalysts that enable biochemical reactions to take place).

Reverse transcriptase, an enzyme that transcribes single-stranded RNA into single-stranded DNA and then helps with the formation of double-stranded DNA. Retroviruses such as HIV use it to reverse transcribe their RNA into DNA, which is then integrated into the host.

RNA consists of a short single strand transcribed from DNA with the 'T' base replaced by 'U'. It performs various functions indicated by names such as mRNA, RNA and rRNA. mRNA (messenger RNA), for example, carries information from the DNA to structures called ribosomes that make the protein coded in the message.

Saltation, from the Latin, *saltus* meaning 'leap'. In *Origin* (p. 194) Darwin wrote, '*Natura non facit saltum*' (Nature does not make leaps), by which he meant nature advances by the 'shortest and slowest steps'. Thomas Huxley disagreed and thought sudden changes or leaps were required to create new species.

Sensory exploitation, exaggerated male traits that provide sensory stimulation to the female that is hard to resist.

Sex is the process of combining genetic material usually from the combination of specialist cells called gametes that take two forms, sperm and egg. Sperm is produced by males and eggs by females and organisms that produce both are called hermaphroditic. The different sexes often exhibit physical differences known as sexual dimorphism. The existence of sex is a topic that has been extensively debated over the last twenty years. The problem with sex is that for the individual it must confer an enormous advantage as only 50% of an individual's genes are passed on to the next generation. There are a number of theories about the nature of this advantage but no consensus. The three most

common hypotheses are that sex creates more variety amongst the offspring, it helps spread advantageous traits and it helps remove disadvantageous traits. The hypotheses often have unusual names and many of them try to reduce sexual selection to natural selection by associating the trait with fitness, for example:

Gravity hypothesis, when females live in high places where males must climb to reach them then males are likely to be smaller so they are more agile.

Sexy sons hypothesis, if a female chooses a male because of some trait and that selection criterion is fairly widespread in the population then her sons will benefit even if the trait reduces their chance of survival. This is because her 'sexy' sons will be more likely to be chosen by other females with the same preference. Her sons and daughters will both inherit her preference and so this situation can, according to Fischer, lead to runaway sexual selection resulting in the relatively sudden evolution of the trait. Experiments, such as adding fake tails and colours to birds and fish have found there can be pre-existing preferences that are not fully expressed in the males.

Recent research has explored complex areas that were not considered by Darwin such as sperm competition, cuckoldry, infanticide, mating by subterfuge, male parental care, mate location, polygamy, homosexual rape in certain male animals, cementing of females' vaginal pores by males in some insects, and insect penises specialized to remove any sperm packets from females which may have been deposited by previous suitors.

Symmetry hypothesis, says that left-right symmetry is a sign of health.

Sexual conflict occurs when the two sexes have conflicting fitness strategies leading to an evolutionary 'arms race'.

Sexual selection, a theory proposed by Charles Darwin that certain traits can be explained by intraspecies competition. Darwin defined it as the 'struggle between the individuals of one sex, generally the males, for the possession of the other sex.' He distinguished between male to male combat using 'weapons' and mate choice (usually female choice of male mates) based on 'ornaments'. A recent definition is 'Sexual selection is a process in dioecious animals (those individuals possessing male and female reproductive organs) that involves competition between individuals of one sex, usually males, for the acquisition of mates of the

same species, and differential success of genetically different individuals in this competition, resulting in the development of secondary sexual characteristics.'

Trait groups, an altruistic trait can win a survival war against selfish traits if it acquires some benefit from each interaction and if selfish members refuse to cooperate with each other. This is because selfish members only benefit from altruists but altruist benefits, if only a little from every encounter with a selfish member. Whether this explains real life altruism is unclear. Trait group selection is one type of multilevel selection theory.

Weapon, a sexual characteristic that one sex, generally the male, uses to fight other members of the same sex in order to obtain or retain the rights to sexual intercourse with the opposite sex, for example, a stag's antlers and possibly, according to recent research, the giraffe's neck. See ornament.

Weismann barrier is the principle that hereditary information only moves from genes to body cells, never in the reverse direction. Lamarckian evolution would break the Weismann barrier. There could be exceptional cases where the Weismann barrier is broken such as horizontal gene transfer and the action of reverse transcriptase.

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The material is not divided into primary and secondary sources, as the overlap between them is too great. Most critical reaction to the artworks and to Darwin's work at the time is regarded as a primary source as I use it as evidence for the cultural beliefs of the period. Most reference material since 1920 is a secondary source except that original science research articles are treated as a primary source unless they only review other research.

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