During his voyage aboard the Beagle (1831-36), Charles Darwin (1809-82) often described his impressions of nature in familiar pictorial terms, either according to the aesthetic categories of the beautiful, the sublime, or picturesque, or by naming artists who came to mind such as John Martin, Salvator Rosa, John James Audubon, the comte de Clarac, and Johann Moritz Rugendas.¹ For example, following an excursion through a ‘sublime & picturesque’ landscape near Rio de Janeiro in 1832, the young scientist entered a tropical forest for the first time and was immediately impressed by the ‘grandeur of all its parts’; he marveled at the lianas (vines that climb trees and compete with them for light) and parasitical plants (which attach to a host), and recalled the Rugendas print *Brazilian Forest* (1828) in which ‘infinite numbers’ of such flora are ‘well represented’ (Figure 1).² This is one of the prints he had in mind when he further enthused in a letter to his mentor John Henslow, ‘I first saw a Tropical forest in all its sublime grandeur.—Nothing, but the reality can give any idea, how wonderful, how magnificent the scene is…Your engraving is exactly true, but underates [sic], rather than exagerates [sic] the luxuriance.’³ Such references as the latter have led to a trend in Darwin scholarship to speculate that the scientist’s later evolutionary thinking is rooted in Romantic pictographic traditions of a vital nature to a greater degree than had been previously acknowledged, and this would appear to reverse a more traditional perspective that scientific evolutionary thinking is fundamentally immune to the relative informality of art (as opposed to scientific illustration, or a more general philosophical

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subtext). However, art and a scientific non-anthropocentric (even evolutionary) perspective on nature has a complex and lengthy dialogical history. To use the Rugendas print as but one example, it could be easily argued that it was Darwin’s enthusiasm for the writings of Alexander von Humboldt (1769-1859) that brought the _Brazilian Forest_ to mind, recalled in a particular light. Rugendas, who had travelled to Brazil on a scientific expedition, had become a protégé of the German scientist. From Humboldt’s perspective Rugendas was able to effectively capture the ‘physiognomy’ of a landscape (a Humboldtian concept): through the use of repetitive archetypal vegetation and correct regional variables he was true to the specifics of physical geography. Humboldt in turn had been greatly influenced in his thinking and vision of nature by exploration art of a slightly earlier period, which itself was created in the company of scientists.

Art before the publication of key texts central to currents of evolutionary discussions in the Victorian period, such as Charles Lyell’s (1797-1875) _Principles of Geology_ (1830-33), Robert Chambers’ (1802-71) _Vestiges of the Natural History of Creation_ (1844), or Charles Darwin’s _Origin of Species_ (1859), included the visualization of specific geographies and

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4 David Kohn has discussed the legacy of Romantic aesthetic theory to Darwin’s evolutionism, including through artistic representations. See D. Kohn, ‘The Aesthetic Construction of Darwin’s Theory,’ in A. Tauber, (ed.), _The Elusive Synthesis: Aesthetics and Science_, (The Hague: Kluwer, 1996), 13-48. Romantic artistic roots behind Darwin’s evolutionary thinking have been most extensively examined by Diana Donald in the field of animal painting, notably in regard to predation and the animal mind; these themes continued after 1860, though arguably with contemporary evolutionary dimensions. See D. Donald, _Picturing Animals in Britain, 1750-1850_, (New Haven: Yale University Press, 2007) and ‘The “Struggle for Existence” in Nature and Human Society,’ and ‘”A Mind and Conscious Akin to Our Own”: Darwin’s Theory of Expression and the Depiction of Animals in Nineteenth Century Britain,’ in _Endless Forms_, 81-97, 195-214. Also see her “Introduction,” in the same text on Rugendas and other Romantic sources.

5 The intersection of Darwin, Rugendas, the tropics (and Humboldt) in the days before Darwin’s publications on evolution does not end here. The official artist of the Beagle voyage, Conrad Martens, upon leaving the expedition in Valparaiso in October of 1834, immediately joined Rugendas and lived and travelled with the German artist for several months. Did Darwin, who held Martens in great affection, meet Rugendas and did they discuss their experiences? Did this change the perspective of either man? At the very least one would assume that Martens communicated information he had gleaned in the company of the Beagle scientists to Rugendas, and Darwin had the opportunity to meet up with Martens again, after the artist had settled in Australia, where they must have discussed Martens’ travels after he left the Beagle.
interdependencies within the organic and inorganic world; plant and animal sensibilities; 
dynamics in nature, including the ‘battle’ between and within species; racial hierarchies; and the 
ape origins of humans that is also identified with later ‘evolutionary’ art. Artists engaged in the 
representation of evolutionary ideas in the mid to late Victorian period frequently turned to 
conventions already familiar to observers, from the Romantic period or earlier, which themselves 
often represented intersections between scientists and artists. Martin Rudwick proposed similar 
kinds of collaborations in terms of constructing accessible imagery in picturing deep time.6

Recent publications on art and evolution in Great Britain have focused almost exclusively on Darwin. For example, Bram Dijkstra has made a case that Victorian paintings of women accompanied by animals or women as animalistic and sexually aggressive responded in part to 
Darwin and Herbert Spencer’s (1820-1903) arguments on the reduced evolution of the female 
brain.7 Diana Donald, Philip Prodger, Jonathan Smith, and Julia Voss have explored Darwin’s 
engagement with depictions of animals by popular artists in Great Britain like Briton Riviere 
(1840-1920) or Joseph Wolf (1820-99) in working out illustrations for his publications.8 Donald 
has discussed the general influence of Darwin in the fields of animal art and social realism.9 
James Paradis, Phillip Sloan, David Kohn, and this writer have suggested ways in which 
Darwin’s developing ideas were shaped by aesthetic theories of the eighteenth and nineteenth 
centuries or how Darwinian aesthetics (sexual selection or symbiotic relationships in nature in which, for example, color is an attractant) posed a challenge to Victorian artists and aesthetic

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theorists. In this essay, I will suggest that much of ‘evolutionary art’ now attached to Darwin is not only deeply rooted in earlier traditions of art-making informed by science, but that scientists and artists will both draw on that history and together will continue to form a complex dynamic after 1860. To demonstrate how interwoven art and concepts of concern to evolutionism have been throughout the various disciplines in science from the eighteenth century to the end of the Victorian period, I will be examining dialogical relationships between artists and scientists in envisioning nature by scientific discipline, including geography and geology, botany, and human evolution.

Geology and Geography
Lyell’s Principles of Geology, which set forth the theory of uniformitarianism, has long been credited with introducing the concept of the transformation of the earth through ongoing processes like volcanic eruptions, floods, erosion, and deposition to Victorian painters. His publications also included discussions on competition in nature between plant and animal groups. For example, in Principles he stated, ‘Every species which has spread itself from a small point over a wide area, must, in like manner, have marked its progress by the diminution, or the entire extirpation of some other [species], and must maintain its ground by a successful struggle against the encroachments of other plants and animals.’ Humboldt, in his mid-century volume Cosmos: A Sketch of the Physical Descriptions of the Universe (1845-62), one of the most popular science books of the nineteenth century, helped promote Lyell’s geological ideas while

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maintaining his own version of harmonious local ecologies which tied climate and elevation to communities of plants and animals. Both scientists were interested in the ‘reorganization of nature’ which followed geological processes that changed the environment.

While dynamic ideas of the earth and its ecologies were active sites of investigation by scientists in the early Victorian period and did indeed influence landscape artists, a pre-existing visual culture of close-eyed observation of the details of land formation and the specifics of flora and fauna had entered British culture through artists accompanying earlier voyages of exploration, and these left a significant legacy to both scientists and landscape artists of the Victorian period.\(^\text{12}\) For example, a biogeographical perspective in the paintings of William Hodges (1744-97) directly influenced Humboldt’s developing ideas and may well have affected Darwin and perhaps Lyell as well. On the one hand, Hodges maintained western conventions in his approach to landscape such as the classical or the picturesque in certain paintings, but on the other demonstrated an interest in the specifics of geography and relatively recent geological activity as in *Cascade in the Tuauru Valley, Tahiti* (1775).\(^\text{13}\) Here he pictures a reshaped valley with a mountainous volcanic background, basalt pillars poking through a rushing stream with its ongoing forces of erosion and, in what could only be a relatively recent period, plants populating even unlikely fissures of the valley’s rocky outcropping.

Hodges travelled in the company of naturalist Georg Forster (1754-94) on Captain Cook’s second voyage to the south seas (1772-5), who developed ideas on the influence of climate on all living things from plants to human physiology and was interested in interconnected regional diversity and geology. We can only speculate on the specifics of


conversations between Forster and Hodges in terms of images (Forster also acted as naturalist-artist on the Cook voyage in his depictions of bird life) and ideas on bio-diversity in the context of geological change and how these shaped their artistic and scientific visions. However, we have more information on Forster’s most famous pupil, Humboldt. Humboldt, who identified Forster as the source of his early interest in climate and the geography of plants, was taken to see Hodges’ later paintings by Forster on a trip to London in 1790. Humboldt claimed this event to be one of the great transformative experiences of his life.\(^1\) He would prove to be highly sensitive to art and its potential to capture local ecologies or general views, often encouraging artists to take up his challenge to approach the landscape with this in mind. His aesthetic inclinations in viewing are revealed in titles of scientific treatises such as *Aspects of Nature* (1807) and *Views of the Cordilleras* (1810). As has been noted, Darwin was moved by Humboldt’s vivid pictorial descriptions and ways of seeing ecologies and geological formations from a unified, interconnected and regional perspective.\(^2\) In *Voyage of the Beagle* (1839), he wrote, ‘As the force of impressions generally depends on preconceived ideas, I may add, that mine were taken from the vivid descriptions in the Personal Narrative of Humboldt, which far exceeds in merit anything I have ever read.’\(^3\) He was also strongly influenced by Lyell during the years of his voyage, gradually converting to Lyell’s geological vision.

Darwin had trained as a geologist at Cambridge, where he studied with Adam Sedgwick (1785-1873), a catastrophist and supporter of the Noachian flood as a final cataclysmic episode to reshape the surface of the earth. At Oxford, William Buckland (1784-1856) had supported

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such ideas as well. Catastrophism, with its multiple, sudden, disastrous events, was accepted by many at the outset of the Victorian period. While the issue of a biblical flood attracted the interest of early nineteenth century painters of the romantic sublime like John Martin (1789-1854), Francis Danby (1793-1861), or J. M. W. Turner (1775-1851), it was fading into the background as a viable explanation of the appearance of the earth’s surface. Even Buckland and Sedgwick by the 1840s, who while perhaps privately nurtured belief in the biblical flood, began to follow the catastrophist Louis Aggasiz’s (1807-73) ideas about glacial eras in their scientific writings, and this too influenced painters who took to the alps to record glaciers. Yet the apocalyptic visions of Martin especially, had such an imaginative hold on the public at the beginning of the Victorian period, that Ralph O’Connor has persuasively argued that Lyell cleverly played into ‘martinien’ pictorial language to then subtly undermine the catastrophist idea that nature’s intensive powers could suddenly appear and disappear. By the middle of the century, the dramatic sweep of natural forces (implying divine agency) found in a Turner or a Martin was being replaced by sometimes extreme close-eyed observations of the surface of the earth and its flora, not unlike certain paintings by Hodges, though often from the perspective of natural theology.

A combination of the rise of geology as a science and the influence of the important art critic and natural theologian John Ruskin (1819-1900), who promoted careful observation of the surface of the earth based on his interest in Lyell and Humboldt, encouraged mid-Victorian landscape painters to focus on landscape details and the specifics of regional geographies. It should be remembered that Lyell was not himself a believer in organic evolution in the 1830s and thus his theories of the earth could easily be upheld by followers of Ruskin, such as the

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artists William Inchbold (1830-88), William Dyce (1806-64), John Brett (1831-1902), or Thomas Seddon (1821-56). William Inchbold’s *Cuillin Ridge* of 1856 is indebted to the same fascination with the specifics of evidence of the past and ongoing geological history of a given area as one might find in certain paintings by Hodges. In the distance are volcanic peaks; the legacy of their past activity can be seen in the igneous rock in the foreground with varying strata, including red granite and black crystalline gabbro. Having been exposed by the passage of glaciers, they are shown beneath the current force of erosion—the Sligachan burn. The painting is far less dramatic than the sublime Romantic paintings of cataclysmic events that catered to deluge theory; indeed, it reveals process.

In *Cosmos* Humboldt brought up the issue of artists and geography (emphasizing the tropics), recalling the importance and legacy of those who had accompanied voyages of exploration. He discussed Hodges paintings of the western islands of the Pacific and the even more “masterly” recent art of Rugendas, Ferdinand Bellermann, and Edward Hildebrandt (who were influenced by Humboldt) in light of effectively capturing the physiognomy of natural scenery. Humboldt recommended to artists extremely large-scale works, especially in the tradition of the panorama, initiated by Robert Barker in the late eighteenth century. He advocated ‘a number of panoramic buildings, continuously alternating pictures of landscapes of different geographical latitudes and from different zones of elevation [that] should be erected in large cities,’ which would ‘serve, in some degree as a substitute for travelling in different regions.’ He also published this advice in England in 1848 in the *Art Journal*.18

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18 In that year, Darwin referred to *Cosmos* in terms akin to the panorama aesthetic as “a grand coup d’oeil of the whole universe” (Darwin to Edward Cresy, May 1848, in *Correspondence of Charles Darwin*, ed. F. Burkhardt et al., Cambridge University Press, 1987, 4:135). Humboldt was especially influential on the panorama in Germany. He was close to the artist Eduard Gärtner and appeared on the rooftop vantage point used in the artist’s Berlin panorama of 1836.
Although the days of the panorama were ending in mid-century England, American
Frederic Church has been connected both to Humboldt and the panorama aesthetic.\(^19\) He was an
avid reader of Humboldt and heeded his call for large-scale spectacular and detailed landscapes
that considered climatic zones with specific vegetation. Church exhibited his enormous *The
Heart of the Andes* (more than ten feet by five) at the German Gallery in London just months
before the publication of Darwin’s *Origin of Species*. In this painting, Church attempted to
capture the diversity and interconnectedness of the organic world in light of elevation and
topography based on his own observations and his reading of Humboldt. From the jungle to
temperate zones to a snow-capped peak, Church painted in microscopic detail and with a grand
sweep. There is nothing to suggest harbingers of evolutionary thinking, but the painting keeps
company with evolutionists who were deeply indebted to Humboldt, notably Alfred Wallace, a
co-founder of natural selection with Darwin, who, inspired by his reading of Humboldt, worked
in the tropics from the late 1840s on. Wallace followed Humboldt on geography, writing
*Geographical Distribution of Animals* in 1876 in which studies of animals in specific habitats
would lead to ‘an increased appreciation of the beauty and harmony of nature, and to a fuller
comprehension of the complex relations…which link together every animal and vegetable form,
with the ever-changing earth which supports them, into one grand organic whole.’\(^20\) Church,
who owned several editions of *Cosmos* and Darwin’s *Journal of Researches* (but never owned
*Origin*), went on to collect Wallace’s books of biogeography and tropical biology in the 1870s,
when he was painting his last major works such as *Morning in the Tropics* (1877). A devout


man, he never-the-less read books by Christian evolutionists later in the century. Though Humboldt himself never read *Origin*, having expired just before its publication at the age of eighty-nine, his understanding of nature and his aesthetic vision had an enormous influence on evolutionary scientists and artists who became convinced of local and regional interconnections between plant and animal species.

Humboldt had used the term physiography to describe the combined studies of zoology, botany, and geology from a regional perspective, but after 1870 ‘physiography’ became a field of its own and was given a new orientation by evolutionist Thomas Huxley (1825-95). Huxley replaced Humboldt’s vision of nature’s interconnected harmony with ‘causality.’ He added Darwinian ideas on changes in nature and stressed the importance of relationships within the organic and inorganic worlds (the combined interaction of the lithosphere, biosphere, atmosphere, and hydrosphere) from a local or site-specific perspective. Physiography also included the uniformitarianism of Lyell. Huxley began to lecture on his ‘evolutionary’ perspective of the earth and its inhabitants in 1869 and it officially replaced physical geography in the school curricula with the assistance of astronomer and fellow physiographer Norman Lockyer in 1877. One of the earliest examples of landscape painting engaged in this approach is former pre-Raphaelite Brett’s *Etna from the Heights of Taormina* painted in the company of Lockyer on a trip to Italy in 1870 (Figure 2). Like Church, Brett had also specialized in a grand sweep of detailed scenery that moves from one climatic zone to another, from valleys to snow-capped peaks, but by the late Victorian period he had lost his faith and moved away from the spectacular and wondrous or innate moralizing. Though *Etna* features a volcano undergoing

eruptions it is low in the distance and barely noticeable. Brett would have been familiar with Lyell’s chapter on Mt. Etna in volume II of *Principals of Geology*, which describes it as the artist paints it, in conjunction with olive groves, herbs, and fruit trees. This scene of a coastal landscape with offshore sedimentation, implications of climate and atmosphere, ongoing volcanic activity, local vegetation, and a human economy where villagers are integrated within these circumstances but not central to it is based in the site specificity of physiography.

Hodges and Forster, voyagers and explorers, artist and scientist, together left a legacy of observation to Humboldt, who claimed them both, and whose aesthetic perspective on an integrated nature from a geographical perspective in turn conditioned the vision of Darwin, Church, Wallace, Rugendas, Bellermann, and Hildebrandt. Lockyer and Brett, artist and scientist, on a journey of exploration in the late Victorian period, were poised at the beginning of an approach to the landscape that made of a given location something of a lesson in a causal chain of inorganic and organic circumstance, a lesson of how and why in nature, including its evolutionary history. Yet these observations, along with the very idea of exploration art as a collaboration between artists and scientists, reached back to the kinds of geographical and geological specifics and integrated perspectives on local landscapes recorded by a Forster or Hodges.

**Botany in Context**

When that great enlightenment taxonomer Carl Linnaeus (1707-88) examined plants he often personified them and even created drawings of human types to whom he believed they were analogous, albeit from a poetic perspective. For example, in his illustrated journals he drew an image of the Greek Andromeda as a lovely nude next to a bog rosemary (which he then
named *Andromeda polifolia*) and wrote of it, ‘Her beauty is preserved only so long as she remains a virgin (as often happens with women also)…’ In Linnaeus’ quasi-erotic discussions of plant life, sometimes exported into names such as the *Clitoria* (butterfly pea) and the *Phallus impudicus* (stinkhorn), was initiated a history of anthropomorphic ways of envisioning flora that was never-the-less scientific from a modern perspective.

As Ann Shteir has noted, analogical ideas drawn between plants and animals by Linnaeus in his sexual taxonomy contributed to the early Romantic evolutionary and physiological speculations of Erasmus Darwin wherein the mechanistic is wedded to systems that are akin to those in the animal world.23 And when at the end of the eighteenth century Darwin’s close colleague Robert Thornton (1768-1837) commissioned artists to create paintings later to be reproduced in part three of his *A New Illustration of the Sexual System of Carolus von Linnaeus*, relationships between plants, fauna, and even humans were to be emphasized. Philip Reinagle’s (1749-1833) *Large Flowering Sensitive Plant* of 1797 was among those paintings in the ‘The Temple of Flora’ exhibition at the Royal Academy in 1804 and the first to be commissioned. Here, the mimosa, sensitive to touch, is approached by hummingbirds which suggest an active role in seed dispersal. The tall, rather delicate plant appears again in the background, this time juxtaposed with a native of Jamaica, demonstrating the plant’s considerable height and perhaps alluding to human analogies of a sensorium. The mimosa as either sensible or merely mechanistic was widely debated during this period and central to larger speculations regarding movement in plants. From Erasmus Darwin’s perspective the mimosa was ‘a sensitive sensorium, or brain, existing in each individual bud or flower’ and the plant is also featured in the opening canto of his poetic ‘Loves of the Plants’ where he presents the mimosa as female and

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modest yet sexual.\textsuperscript{24} Unlike Erasmus Darwin, to whom in many ways he was indebted, Thornton was no evolutionist; a dynamic understanding of nature was part of a divine ideal order. Nevertheless, a visual culture that promoted a public awareness of flora with male and female sexual parts based on Linnean taxonomy and the role of insects and birds in pollination and seed dispersal, prepared the ground for a later Victorian acceptance of similarities in sexuality among plants and animals.\textsuperscript{25} And tropism continued to be debated with the mimosa as the central example of possible ‘nervous’ sensibility.

Evidence drawn from botany played an important role in making the case for evolution in the writings of Charles Darwin and his followers such as John Lubbock (1834-1913), Asa Gray (1810-1888), and Joseph Hooker (1814-1879). By the time he had became Director of the Royal Botanic Gardens at Kew in 1865, the great botanical explorer Hooker had been a proponent of natural selection for five years. Between 1862 and 1880 Darwin published six botanical books. In them, plants and flowers responded to stimuli; developed, through interactions with insects, various ‘contrivances’ and color to ensure cross-fertilization; and some, located in regions with poor nutrition available, even cleverly adapted carnivorous digestive strategies. Indeed, Darwin’s inductive and careful experimentation on plants and flowers did much to establish his reputation as an evolutionary theorist and gained him considerable respect among botanists and amateur horticulturalists.\textsuperscript{26} From a broader public perspective, there was greater awareness that flowers were not merely or even mainly aesthetic, but that the existence of the flower was first and foremost necessary in the production of seeds that would ensure continuity of species and

\begin{itemize}
\item\textsuperscript{24} Erasmus Darwin, \textit{Phytologia, or, The Philosophy of Agriculture and Gardening}. London: J. Johnson, 135. Quoted in Shteir, ‘Sensitive, Bashful, and Chaste?’, 177.
\item \textsuperscript{25} On heightened awareness of analogies between human sexuality and flowers now see Alan Bewell, “’On the Banks of the South Sea’: Botany and Sexual Controversy in the Late Eighteenth Century,” in \textit{Visions of Empire}, 173-96.
\item \textsuperscript{26} For a detailed discussion on the important years immediately after 1859 when Darwin gained attention in botany, see Richard Bellon, ‘Inspiration in the Harness of Daily Labor: Darwin, Botany, and the Triumph of Evolution, 1859-1868, \textit{Isis} 102,3 (Sept. 2011), 393-420.
\end{itemize}
that pollination was fundamental to survival (though Ruskin disagreed, writing in his botanical
_Proserpina_, ‘the flower is the end or proper object of the seed, not the seed of the flower.’)
Darwin’s explanations of the importance of color and scent to attract insects and markings and
ornamentation to guide them to a flower’s nectary and from there to distribute pollen to ensure
cross-pollination were widely accepted.\(^\text{27}\)

One botanical painter (and friend of Hooker) who turned to evolutionary ideas and
followed the ongoing interest in the movement of plants was Marianne North (1830-1890). She
appears to have heeded Humboldt’s advice that the future for artists was in the tropics for she
cited her own ‘rage for seeing the Tropics’ and her floral paintings were initiated in Jamaica in
1871. North knew and admired Darwin and sought his advice on her travels; Philip Kerrigan has
connected her paintings to Darwinian theories of adaptation and struggle for survival.\(^\text{28}\) Some
paintings feature conflict among plants, which had already been discussed by Erasmus Darwin in
_The Temple of Nature_ (1803) and, as mentioned above, by Lyell, among other scientists. Certain
paintings take up ‘predatory’ movement in plants (as in strangler figs), which had been of
interest to Rugendas, or ‘anthropomorphic’ insect-eating plants. *Cluster of Air-roots of a Dragon
Tree, Tenerife* (1875) features the type of tree and location that had first so gripped Darwin in his
reading of Humboldt that he had attempted to secure a voyage to Tenerife before undertaking the
Beagle voyage. The roots that grow in air rather than soil upon which she focuses in this
example feature an adaptive strategy in forests too crowded for all roots to penetrate the earth.
North was successful in convincing Hooker to allow her paintings a gallery of their own at Kew
in 1882, where they remain today.

\(^{27}\) On Darwin’s scientific detractors in light of his botanical treatises see J. Smith, “Evolutionary Aesthetics and

\(^{28}\) Philip Kerrigan, ‘Marianne North: Painting a Darwinian Vision,’ _Visual Culture in Britain_ , 11 (2010), 1-24
In the late Victorian period, accumulating evidence of plant and animal similarities included the popularization of protoplasm (believed to be a substance tying plants and animals together); a demonstrated cellular basis to all living things; growing evidence of commonalities of metabolic processes and respiration; and the presence of growth hormones in plants. These connections eventually led to an evolutionary envisioning of botany by Scottish Symbolists that once again emphasized tropism and made connections with humanity now explicit. While the botanical paintings of the Glasgow Four can make use of floral symbolism in a traditional and even a biblical manner, it is equally informed by evolutionary ideas, which may have been partly inspired by botanist Patrick Geddes (1854-1932), who was central to a Symbolist movement in nearby Edinburgh and with whom they were in contact. Geddes was one of Thomas Huxley’s students and he corresponded with Darwin. He was author of books on evolutionism beginning in 1863, including *Chapters in Modern Botany* (1893), dedicated to the memory of Darwin. *Chapters in Modern Botany* was arranged according to Darwinian ideas on insectivorous plants, movement and nervous action in plants, and the Darwinian web of life (including relationships between plants and animals). In pictures by Charles (1868-1928) and Margaret Macintosh (1865-1933) and James (1868-1955) and Frances Macnair (1874-1921), human figures are united with roots, leaves, and vines. Sexual coupling, reminiscent of the basis of Linnaeus’s system, is frequently alluded to as are transparent round globular forms from which plants and human bodies emerge, suggesting origins and protoplasm.\(^{29}\) The Glasgow Four were also closely allied to Art Nouveau currents on the continent, similarly steeped in ideas of the dynamic lives of

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plants and commonalities between kingdoms. This late nineteenth-century manifestation in art and decoration owes in part to public interest in evolution. Unlike Victorian painter Frank Dicksee’s *The Sensitive Plant* (c. 1890) in which a presumably innocent young maiden touches an equally retiring plant from a separate realm of life, ‘the four’ combine plants and humans, they are organically fused. In *Part Seen, Part Imagined* (1896) by Charles Macintosh, Margaret Macdonald appears within an armature of tendrils, her feet disappearing into roots, and her head pillowed by the sun; crowning this are blossoming flowers (Figure 3).

Despite his dedication to Darwin, Geddes was less interested in struggle in nature than he was in cooperation and symbiosis, a harmonious vision closer to Humboldt. At the same time, his studies of local ecologies grew out of Huxley’s physiography. When he established the Symbolist journal *Evergreen* beginning in 1895 (which included articles on evolution along with poetry and prints) he emphasized the subject of seasonal renewal; regeneration in nature was the central factor for human communities everywhere. Symbolist artists that gathered around Geddes in Edinburgh such as John Duncan (1866-1945) or Charles Mackie (1862-1920) participated in a celtic revival tied into the deification of nature’s forces; the seasons were often interpreted symbolically and mythically. Geddes had mystical tendencies. He was a pantheist; mind did not develop from matter as Darwin would have it; spirit and mind had always existed in nature. His panpsychism drew him to the monist beliefs of Ernst Haeckel, Darwin’s greatest German admirer. Haeckel was also an influential artist in his own right and his detailed renderings of nature’s organisms (many of which were gathered together in the book *Art Forms of Nature*, 1899-1904) were an important resource for Art Nouveau. From 1887 to 1899 Haeckel frequently

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30 Art Nouveau decorators preferred to incorporate forms based in organic beings such as coral, hippocampi, and jelly fish, which had a controversial history in systems of classification.
attended Geddes’ summer institutes, which also included luminaries like Kropotkin and geographer Elisee Reclus.

Tropism and sensitivity in plants had been compared to the human sensorium from the eighteenth century forward, in science and art. After Charles Darwin’s botanical publications, plants were recognized as sharing in animal/human processes and modes of life, and this strengthened visual references to human and plant similarities, explored within the imaginative field of Symbolism. The world-wide explosion of research in botanical evolutionism was an important resource for Art Nouveau with its many references to motile vines and stems.

**Human Evolution**

Just as geography, geology, and botany were active arenas of complex interactions between scientists and artists exploring evolutionary themes, such is also the case for those who were intrigued by the possible relationship of humans to animals, especially apes. Similarities between humans and apes had been noted for centuries, and painters beginning in the seventeenth century had created *singeries* (monkeys aping human behavior) to suggest human foibles and deviancy. The legacy of these ideas was such that pre-Raphaelite artist Thomas Woolner was led to examine monkeys for inspiration for a sculpture of the devious Celtic imp *Puck* in 1847. In the course of these studies he noted a feature of the ears shared by monkeys and certain humans; in turn, when he befriended Charles Darwin at the time of a portrait commission twenty years later, the scientist then affirmed the inward indentation of the external ear in humans as a residual evolutionary feature and illustrated the “Woolnerian tip” in *The Descent of Man*.³¹

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³¹ This is illustrated as figure 2 in *The Descent*. Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (London: John Murray), 1871, 22.
Though *singeries* were not rooted in serious evolutionary speculations, the enlightenment and its aftermath brought with it a greater interest in the close organic relationship of humans to apes. Based on reports of savages likened to monkeys, Linnaeus revised his classificatory scheme *Systema Naturae* in the tenth edition (1758) to include the orangutan (*homo sylvestris*) as part of the genus *homo*, under the general order *Primates*. Never-the-less, evolutionism was rejected. In his *Discourse on Inequality* (1755), Jean-Jacques Rousseau (1712-78) suggested that the orangutan might be human and asserted that orangutan society was similar to our own. He even advocated experiments in cross-breeding. Henri Fuseli (1741-1825), who had defended Rousseau’s ideas might have had this in mind in his sensational painting *The Nightmare* (1781) in which a ‘demon ape’ (as described by Erasmus Darwin in the poem that accompanied the engraving after the painting two years later) pins down a female victim. Generally in the eighteenth century, however, direct comparisons between humans and apes were used as terms of derision rather than true evolutionary fact. Despite Buffon’s own vacillation on the relationship of human to ape, his mid-century *l’Histoire naturelle* distinguished humans as separate from all other animals and most followed this perspective. Man had existed in an original state of unity, followed by dispersal and for some, clear states of degeneration. The reason for difference was subsumed within variation in climate. Buffon established a hierarchy with blacks at the bottom and whites at top with moral and mental differences that was considered authoritative. However, the issue of evolution and apes had not ended there. At the end of the eighteenth century, evolutionist Erasmus Darwin had gone from the general claim that

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32 Rousseau writes, ‘Our travellers do not hesitate to make beasts by the name of Pngos, Mandrills, Orang-outangs of the same beings which the Ancients made into Divinities by the name of Satyrs, Fauns, and Sylvans. Perhaps after more accurate investigation it will be found that they are neither beasts nor gods, but men.’ See ‘Notes’ to *Second Discourse in The First and Second Discourses*, V, Gourevitch, (trans. and ed.), (NY: Harper & Row, 1986), 219. Rousseau also believed that speech and animal sounds were both tied to the passions.
the entire organic world had evolved from a single, living ‘filament’ in *Zoonomia* to the specifics of human evolution from quadruman in his posthumous *Temple of Nature* (1803).33

Erasmus Darwin’s friend, the animal painter George Stubbs (1724-1806), seemed to share an anthropomorphic and possibly an evolutionary view of creatures, for he specialized in painting expressive animals, sometimes engaged in a struggle for survival (about which Erasmus had written). In 1774 and 1798 Stubbs depicted a southeast asian macaque eating a peach and regarding the viewer with an intelligent, soulful expression. Around the time Erasmus Darwin was writing *Temple of Nature*, Stubbs was undertaking a series of anatomical renderings that included a human skeleton, not only in the traditional upright position, but crouching and crawling, along with a monkey in an upright ‘human’ pose. The salacious and deviant (*singeries, Fuseli*) and the sensate and comparative (Stubbs) are two trends in considering ape ancestry that continue in the Victorian period. However, at the time Erasmus Darwin’s *Temple of Nature* was published, William Paley’s *Natural Theology* (1802) had already appeared, an argument for divine design and the separateness of humans from animal creation that undermined evolutionary speculation for decades.

Challenges to the conception of human distinctness eventually emerged from the field of anatomy. Early anatomists who had made use of ape skulls along with human racial crania to create a hierarchy such as Petrus Camper (1722-89) at the end of the eighteenth century did not have evolution in mind; however, their racial ranking, especially in the case of Camper, who established a trajectory of skulls from ‘tailed monkeys’ to the orang-outang to the ‘Negro,’ Chinese and ‘Chalmuck’ to Apollo Belvedere and famously developed a facial angle for these

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33 The eminent anatomist Cuvier had distinguished between apes and humans based on differences of hands and feet, humans being bimana or two handed and apes being quadruman or four handed.
skulls, would be deployed in later decades under the authority of evolutionary theory.\textsuperscript{34} From the early decades of the Victorian period, cranial variation between races and classes was a continual point of reference in self-definition and in positioning others, often involving ideas on moral and intellectual difference. For monogenists like James Prichard (1786-1848), whose illustrated edition of \textit{Natural History of Man} appeared in 1845, climate and circumstance shaped crania and body types. For polygenists races were separate species. All used terms that would be employed in later decades under evolutionary speculation such as lower races whose base tendencies might be seen in their ‘prognathous jaws.’ And British populations could be compared to the exotic and inferior; when London’s poor were categorized as coarse and undeveloped and illustrated as such in Henry Mayhew’s \textit{London Labour and the London Poor} (1861), it was Prichard’s treatise that was the source of reference.\textsuperscript{35} The ongoing legacy of enlightenment monogenism which theorized degeneration of some populations based on environment provided a biological rationale for social immobility. And for polygenists like Robert Knox (1791-1862, \textit{The Races of Man}, 1850) racial difference meant permanent intellectual difference as well.

In early to mid-Victorian art references to cranial and physiognomic difference was everywhere: in Thomas Faed’s (1826-1900) \textit{Visit to the Village School} (1852) in which a young boy in an unruly all white classroom draws the exaggerated profile of an impassive black footman; in John Lewis’s colonial \textit{The Pipe Bearer} of 1856 in which a dark-skinned young Nubian man is turned in profile to show a heavy jaw and sloping forehead in dramatic juxtaposition to the head of his white employer; or even in local genre paintings by George Hicks (1824-1914), William Powell Frith (1819-1909), and William Egley (1791-1851) in which

\textsuperscript{34} Camper’s own inspiration was Buffon and the influence of climate on peoples who had all descended from Adam and Eve.

whites of unsavory character are represented with clear physiognomic difference. As early as 1853 Hicks had written about the prognathous type with heavy jaw and the receding forehead of the brute versus the orthognathism and the superior type in his Guide to Figure Drawing.\textsuperscript{36} Frith followed such ideas in his vast crowd paintings. His criminal in The Railway Station (1862) was recognized instantly by his public through his prominent jaw, low forehead, and protruding lips.\textsuperscript{37} Environment continued to be perceived as a contributing factor in primitive types among the urban working class, but hereditary Lamarckian dimensions of these conditions were also referenced, including well into the late nineteenth century in the writings of Charles Booth and Llewellyn Smith.

Celtic, Norman, and Saxon types, were linked to the lower, upper, and middle classes respectively. Knox was especially keen on pointing out racial difference within British classes at mid-century. Later, John Beddoe’s Races of Britain (1885) and N. Macnamara’s Origin and Character of the British People (1900) absorbed the growing authority of evolutionary theory within national difference; both implicate the Celts as the lowest of British types, Beddoe finding among them a prognathous “Africanoid” type.\textsuperscript{38} It is the continued circulation of such discriminatory ideas that makes Scottish artists’ George Henry (1858-1943) and Ernest Hornel’s (1864-1933) important celtic revivalist The Druids: Bringing Home the Mistletoe (1890) so striking; the physiognomy and crania of certain members of this dark-skinned primitive cattle-loving population positions them as ‘rudimentary’ (though this could be interpreted according to theories of Indo-European origins as well).

\textsuperscript{37} Ibid., 307
\textsuperscript{38} John Beddoe, Races of Britain: A Contribution to the Anthropology of Western Europe, Bristol: J. W. Arrowsmith, 1885, 11-12.
As discussed by Nancy Stepan and other scholars of race of the Victorian period, the racial rankings before 1860 held by both monogenists and polygenists (both popular positions) were later reinforced by further developments in evolutionary theory. For Darwin as for other early Victorians including influential sociologist Herbert Spencer there were mental and cranial gradations from the lower races to the higher, but for Darwin (and Spencer) there was no significant gap between animals (apes) and humans given a common progenitor, and now the various races could be positioned between simians and whites. And, a late nineteenth century common idea, that ‘lower races’ were doomed to subjugation or extermination, fed currents of social Darwinism.

Even before Darwin took on the question of human descent, Huxley’s *Evidence as to Man’s Place in Nature*, published in 1863, addressed at length the issue of ape ancestry. In the year of Huxley’s much discussed publication, the animal painter-illustrator Joseph Wolf (1820-99), who went on to depict a black crested ‘laughing’ ape *[Cynopithecus niger]* in Darwin’s *The Expression of the Emotions in Man and Animals* (1872), exhibited *Row in the Jungle* at the Royal Academy (Figure 4). No less anthropomorphic than the macaque by Stubbs, Wolf’s rhesus macaque monkeys congregate to sound an alarm to members of their band at the approach of a predator.

Wolf had originally studied painting in his native Germany and maintained a dual identity in illustration and painting after settling in London in 1848 where he specialized in scenes of predation, a familiar staple in animal art. In his approach he appears to have been influenced by John James Audubon’s (1785-1851) emotive and knowing creatures (whose work had been equally memorable for the young Charles Darwin); he often made use of his low
perspective and eye contact created between creature and viewer. Unlike his older friend Edwin Landseer (1802-73), with whom he shared an interest in the tragic lives of wild creatures, he never ventured in the direction of sentimental pet paintings. His Row in the Jungle includes greater concerns with camouflage that emerged after reading the Origin, yet despite his careful studies of animals for which he was renowned, a humanizing perspective, especially where apes were concerned, is part of his program, however unintentional. Around the time he executed this painting, Wolf produced illustrations for his book The Life and Habits of Wild Animals published years later in 1874, which popularized his work. Monkeys and apes are treated in two chapters, including the opening one, and in passing accounts (including a scene with a tiger for which this painting may have been intended as illustration, though not used.) In his illustration for ‘A Happy Family,’ which has much in common with the simian canopy in Row in the Jungle his evolutionist friend Daniel Elliot (who authored the text) wrote of ‘mamas snatching up their lovely babies…with an impulse and action perfectly human’ and a group response to a ‘pilfering’ monkey (a subject common to former singeries) as ‘we know all about it you little thief and your well-counterfeited expression of surprise has no effect on us!’ The human dimensions of monkeys became such a popular point of discussion after 1860 that even Landseer, never associated with ‘the monkey thesis’ itself, depicted an emotive simian pair in which one comforts the other in The Sick Monkey exhibited at the Royal Academy in 1870. It was not until the following year that Darwin published his ideas on human and ape relatedness in terms of

39 Darwin discussed his original encounter with Audubon during his youth in his autobiography and frequently cited him in his later writings. Charles Darwin: His Life Told in an Autobiographical Chapter and in a Selected Series of His Published Letters, Francis Darwin, ed., London: John Murray, 1892, 14.

mental and ‘moral’ life; for example, all shared imagination, reason, curiosity, inventiveness, and the kinds of social instincts envisioned by Landseer and Wolf.

The relationship of apes to humans and implications regarding racial difference was given scientific backing after 1860 through recapitulation theory and the growing evidence of craniometry. Recapitulation is the notion that the development of the fetus recapitulates the phylogenetic history of the species, with, in the case of humans, certain races reaching a limit in development—a full trajectory being available only to whites, who through time had enjoyed greater evolutionary development. Recapitulation theory was formulated in the 1820s by Etienne Geoffroy Saint-Hilaire and followed by some (including Chambers) in the early decades of the Victorian period. However, it only became deeply embedded in evolutionary discourse with the further development of the theory by Haeckel in the 1860s. In addition, in his *Natural History of Creation* (1868), Haeckel also established a hierarchy of heads, not unlike Camper. These ran from the baboon to the Indo-Germanic individual. German Karl Vogt’s (1817-1895) studies in the area of craniometry along with those of Frenchman Paul Broca (1824-1880) further reinforced racial hierarchy and were embraced by Darwin; skull variation, size, and weight were applied to class and gender difference as well as race.

Herbert Ward (1863-1919) is an example of an ethnographic sculptor influenced by recapitulation theory. Ward had lived in Zaire in the 1880s and produced salon sculptures of Africans in simple or sensationalized states such as ‘art-making’ by tracing a line in the sand, kindling wood, or dancing wildly with an idol (Figure 5). In his book *A Voice from the Congo* (1910) he wrote, ‘The…arrest of the intellectual faculties [in blacks] has been attributed to the premature closing and subsequent ossification of the sutures of the skull, thus arresting the
normal expansion of the brain.\textsuperscript{41} The theory of ‘early’ closure of the frontal sutures among Africans was a popular concept widely held by British anthropologists such as Augustus Keane.\textsuperscript{42}

Evolutionary ideas were appropriated and applied in a number of ways, including through the influential sociology of Herbert Spencer. In his \textit{First Principles of a New System of Philosophy} of 1862 he invoked craniometry, progressive evolutionism from a homogenous to an increasingly heterogeneous state, and Darwin to uphold the inequality of peoples.\textsuperscript{43} As early as 1852 he had argued that the weak were eliminated in the path of progress and population: ‘Only those who exert themselves and advance…will survive, other are on the high road to extinction.’\textsuperscript{44} From his perspective, protestant virtues of labor and initiative aided the individual in the struggle to survive and progress. By 1867 he was underscoring his ideas about racial, class, and gender difference with reference to recapitulation theory.\textsuperscript{45}

The social realist painters that addressed the poor and disenfranchised in the later Victorian period include Frank Holl (1845-88), Luke Fildes (1843-1927), and Hubert von Herkomer (1849-1914). The Malthusian dimensions of Spencerism and Darwinism (also found in the poetry of Darwin’s grandfather on evolution) are suggested, for example, in works by Herkomer whose paintings of the listless invoke the futility of struggle against the wretchedness of life. But certain social realist paintings could be perceived as not upholding, but rather critiquing, Spencerian ideas. Faed’s \textit{From Hand to Mouth} (1879) includes references to race and species. An impoverished and desolate family is accompanied by their pet monkey whose

\textsuperscript{42} Ibid., 18-19.
\textsuperscript{43} Herbert Spencer, \textit{First Principles of a New System of Philosophy}, 2\textsuperscript{nd} ed.,(London: Williams and Norgate) 1867, 121, 133.
\textsuperscript{45} Spencer, \textit{First Principles}, 313-14.
anthropomorphic tricks help them earn a few coins. They have frightened a wealthy young girl who turns to her mother. Behind this woman is a young, black pageboy, who in turn holds the leash of this family’s pet, a dog that identifies not with the boy, but with the wealthy woman against whose leg it leans. The boy’s presence is a reminder of the colonial present and the local history of the post-slavery period, and his lack of importance is demonstrated by his peripheral position as he fades into the shadows at far left. The sense of entitlement of the wealthy woman and her child as portrayed by the artist along with the air of disapproval towards the impoverished family by the shopkeeper suggests a lack of empathy for and a naïveté towards the social circumstances that have resulted in the present moment, and this appears to be ultimately unsupported by Faed.

Evolution brought with it fear of degenerate behavior and reversion. Among whites, aggressive sexuality in women, addictions, effeminacy among men, and crowded urban situations of the already inferior members of the working class were implicated. Darwin had warned of homologies between men and animals, ‘the rudiments which he retains—and the reversion to which he is liable,’ in The Descent. Theorists of degeneration included E. Ray Lankester, who wrote Degeneration: A Chapter in Darwinism in 1880, Havelock Ellis who published The Criminal a decade later, and Darwin’s first cousin Francis Galton. Max Nordau famously branded modern artists themselves such as those of the Aesthetic movement as degenerates, along with their sensual paintings.

Recapitulation theory had ‘affirmed’ that women were lower on the evolutionary scale than men, and it was they who were most immediately implicated in regressive behaviors. Artists at the end of the century, such as Arthur Hacker (1858-1919) represented sexualized women as bestial, and the British animal specialist Arthur Wardle (1860-1949) often painted enchantresses.

with entourages of beasts. Mermaids began to take on direct evolutionary associations while retaining a traditional mythological role of siren as in John Waterhouse’s (1849-1917) *Mermaid* (1901) located near dangerous rocky outcroppings in the sea; now a reminder of the threat of regression and unbridled sexuality. In Huxley’s son-in-law’s painting *The Land Baby* (1909), artist John Collier has depicted a mermaid seated on a shore regarding a young human who seems to have emerged from a cave-like background. The ‘demon ape’ representing the salacious, immoral, and primitive self was never far from the specter of degeneration in visual culture—John Dollman’s (1851-1934) nude fatal women who are accompanied by entourages of monkeys in rudimentary landscapes as in *The Temptation of St. Anthony* (1897) bring up contemporary devolutionary concerns.

As early as the eighteenth century, exotic non-white women were associated with licentiousness as in the sensual Tahitian bathing nudes with tattooed buttocks in paintings by Hodges. But by the nineteenth century as racial hierarchy solidified under new scientific ideas, black women were especially stigmatized as overly sexual. In 1810 Saartjie Baartman (1789-1915) or the ‘Hottentot Venus’ (belonging to the Khoekhoe tribe) was exhibited in London as such an exemplar of exaggerated sexuality, the signs of which included enlarged labia and protruding buttocks. In an important article on African sexuality, European prostitution, and Baartman, Sander Gilman has argued that it is this history and its later evolutionary implications that one sees operating in such Victorian Orientalist harem paintings as Edwin Long’s (1829-91) 1882 *The Babylonian Marriage Market*. In the painting, the women are arranged according to Victorian conventions of beauty, with the most European and lightest-skinned woman at left to

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the woman with the most Negroid features at right. The one truly black woman is the servant on the auction block, with her buttocks facing the viewer. White prostitutes became implicated in devolutionary ideas during the nineteenth century. Cesare Lombroso, whose late nineteenth century views on atavism among prostitutes and criminals were influential, claimed that white prostitutes had prehensile feet like a monkey, stating ‘the morphology of the prostitute is more abnormal even than that of the criminal, especially for atavistic anomalies, because the prehensile foot is atavistic.’

The observation of human likeness to apes stretches back centuries and in the late Early Modern Period was broached in relationship to light-hearted scenes of deviant behavior (singeries), classification systems, and anatomical observation. Themes of deviancy and anthropomorphic sensibility in the depiction of apes and ‘undeveloped’ humans have a continuous history in art and science from the eighteenth century to the late Victorian period.

Conclusion

Victorian evolutionary art is deeply rooted in earlier traditions of envisioning nature, the history of the earth, and the self and the simian. It does not always involve a simple linear narrative of

science directly influencing painting and sculpture; the art and the science are often dialogical. Unlike the hybrid evolutionary images that exist on the continent (Klinger, Kubin, Cormon, Redon, Böcklin, Rops, von Max) art that attempts to envision the act of evolution (apart from cartoons) is rare in Great Britain, and a close reading of scientists and their visual culture and artists and their scientific interests is important in examining ways in which artists might be engaged in and engaging evolutionary science. And greater depth in understanding intersections between art and evolution awaits research on individual artists as has occurred with Marianne North, Herbert Ward, or Joseph Wolf in order to securely tie art to specific evolutionary contexts. Although Darwin remains the greatest attraction in terms of evolutionists and visual culture, very little has been offered on the subject of populist Huxley, cosmologist Chambers, or spiritualist Wallace, all of whom had varying ideas on evolutionism and their own public defenders and followers. Haeckel’s influence in Great Britain is more significant than is usually observed and Lamarckianism is often obscured in favor of Darwin, yet even Spencer owes his greatest debt to this French scientist. Despite the significant and ever expanding literature on Empire and the colonies no major study has been offered to date on the various strands of evolutionism and how this might complicate the representation of race during the Victorian period.

In this essay, I have tried to call attention to certain of the visual traditions that pre-existed the Victorian period in the representation of a non-anthropocentric nature that were familiar to later artists concerned with evolutionism and their audiences. These traditions emerged during the enlightenment and continued to be fostered in certain circles in a collaboration of artists and scientists at a time when visual and scientific endeavors were not always seen at separate spheres of endeavor. Attempts to capture a changeable nature in the
paintings of exploration artists—often foregrounding volcanoes or the legacy of their active states with a close-eyed focus on specific sites—grew out of older controversies of volcanism versus neptunism in the formation of the planet. Later, scientific controversies over Lyellian uniformitarianism and Humboldtian ideas concerning geographies, led artists to build on this background, including the implications of changing geological formations and ongoing volcanic activity to the survival of organic life forms. The Great Chain of Being as a generally acceptable means of understanding the relationships of organic life forms in the eighteenth century along with biblical, monogenist explanations of populations that had degenerated from a common human ancestor under climatic conditions, made ape anatomy and behaviors appear to be but a short distance from man--an arena for humor, moralizing, or speculation with attendant visual cultures. These too provided a familiar visual resource in the Victorian period with more serious implications of human ancestry. While plant sexuality and sensitivity could equally be envisioned within the context of non-evolutionary hierarchies and natural theology, exotica such as the mimosa had been publically sensational and memorialized in poetry and visual culture during the Enlightenment and the Romantic period. Such a plant might be compared to the human form by Reinagle and later by Dicksee, but the evolutionary implications of such relatedness eventually led to a fusion of human and plant forms in the later Victorian period or the suggestion of active plant tropism in Art Nouveau.
Figure 1. Johann Moritz Rugendas, *Brazilian Forest*, 1828, lithograph on chine collé, laid down on card. 62 x 50 cm., British Museum, London, Department of Prints and Drawings.

CAPTION: The ‘sublimity’ and physiognomy of a tropical forest as experienced by Charles Darwin and depicted by Rugendas is steeped in Humboldtian aesthetics.
Figure 2. John Brett, *Etna from the Heights of Taormina*, 1870. Oil on canvas, 84.4 x 121.9 cm., Sheffield Galleries and Museum Trust

CAPTION: Brett follows Lyell and the physiography of Huxley and Lockyer in depicting a specific site from the perspective of causality. Ongoing erosion and volcanic activity are neither perceived as sublime nor applied to other romantic conventions, but instead are seen as contributing to a gradually transforming terrain.
Figure 3. Charles Rennie Mackintosh, *Part Seen, Part Imagined*. 1896. Watercolor, pencil, paper. 39 cm. x 19.5 cm. Design for Miss Cranston’s Buchanan Tea Rooms, Glasgow, Scotland. Culture and Sport Glasgow (Museums)

CAPTION: Analogical relationships between humans and plants originally inspired by Linnean sexual taxonomy and discussions on tropism and sensibility in the 18th century became reinforced in visual culture in the 19th century through the popularization of protoplasm and similarities in cellular life and metabolic processes, often discussed in light of evolutionism.
Figure 4. Joseph Wolf, *A Row in the Jungle*, 1863, watercolor, 76 x 61 cm., Zoological Society of London.

CAPTION: In 1863 Thomas Huxley’s *Evidence as to Man’s Place in Nature* brought to a head discussions on simian relatedness to humans. Joseph Wolf became interested in evolutionism and advantages found in camouflage after reading Darwin’s *Origin*. 
CAPTION: Sensationalistic or simplistic activity among Africans as sculpted by Herbert Ward are based in popularized notions of recapitulation theory in which blacks progress degrees beyond apes, but do not reach the full evolutionary development of whites.