Picturing Evolution and Extinction

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Regeneration and Degeneration in Modern Visual Culture

Edited by

Fae Brauer and Serena Keshavjee

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FOR OUR CHILDREN —

MARCUS, LARA, ADAM AND JURA

NADIR AND DEVIN

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Fae Brauer and Serena Keshavjee

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INTRODUCTION

THE JANUS FACE OF EVOLUTION: DEGENERATION, DEVOLUTION AND EXTINCTION IN THE ANTHROPOCENE

FAE BRAUER

Living amidst the sixth mass extinction in the Holocene epoch, endangered species and the loss of biodiversity have become everyday news.[1] Since the advent of industrial capitalism and global warming, the levels of carbon dioxide in the atmosphere have increased at an alarming rate. With the burning of fossil fuels and deforestation, the concentration of carbon dioxide in the air is now higher than it has been in the last million years with a deleterious impact upon the survival of 140,000 species ranging from the Panamanian Golden Frog to the Sumatran Rhino. With this carbon dioxide absorbed by our oceans, their pH levels have been lowered and marine life destroyed, the Caribbean Monk Seal being officially declared extinct in 2008. Due to ocean acidification, coral reefs that were once perceived as threats to human survival, particularly during Captain James Cook's voyages, are now identified as so "inherently fragile" that they are threatened to the extent that they may become extinct by the end of the 21st century.[2] With the current rate of anthropogenic mass extinction estimated to be astronomically higher than any of the five previous periods of mass extinctions in the history of the earth,[3] President of the American Association for the Advancement of Science, Peter Raven has predicted dire ramifications:

> We have driven the rate of biological extinction, the permanent loss of species, up several hundred times beyond its historical levels, and are threatened with the loss of a majority of all species by the end of the 21st century.[4]

Like many other scientists working in this field, Raven identifies the culprit as human. As Stephen J. Gould exclaimed in 1980, "We are doing it to ourselves".[5] So distinctive has human-driven extinction become since the Industrial Revolution, particularly with the burning of fossil fuels during the Atomic Age, that in 2000 Nobel Laureate, Paul Crutzen, in collaboration with biologist, Eugene Stoermer, proposed that it signified a new era in the Holocene that needed to be designated by the term, Anthropocene.[6] Inherent to human evolution as conceived in terms of industrial and technological progress, extinction then appears as its flip-side in the Anthropocene, if not, as I have entitled this essay, its Janus face. Inscribed as rampant, the concept of this sixth mass extinction and the Anthropocene is integral to a paranoiac discourse of ecological disaster and a culture of catastrophism, which seems to have been grafted onto the discourses of nuclear extermination from the end of the Cold War.[7]

The accelerating rate of climate change and ecological damage encompassed by the concept of the Anthropocene has ignited a dystopian culture concerned with destruction, loss and the end of animal-animal and human-animal species, alongside memory, mourning and melancholia.[8] Epitomized by the doomsday clock devised to calculate the end from unchecked climate change and the nuclear arms race, the apocalyptic dimensions of this culture are not dissimilar to the phobic cultures of degeneration, devolution and extinction that circulated a century ago through parts of Europe in response to the theories of Charles Darwin and Jean Baptiste Lamarck, as well as those of Paul Broca, Camille Flammarion, Ernst Haeckel, Thomas Huxley, Félix Le Dantec, Cesare Lombroso, Charles Lyell, Bénédite-Augustin Morel, Louis Pasteur, Edmond Perrier, Elisée Reclus, Rudolf Steiner, Hippolyte Taine, Wilhelm Wundt, and others explored in this book.[9]

Degenerating Bodies, Doomed Races and Cro-Magnon Men

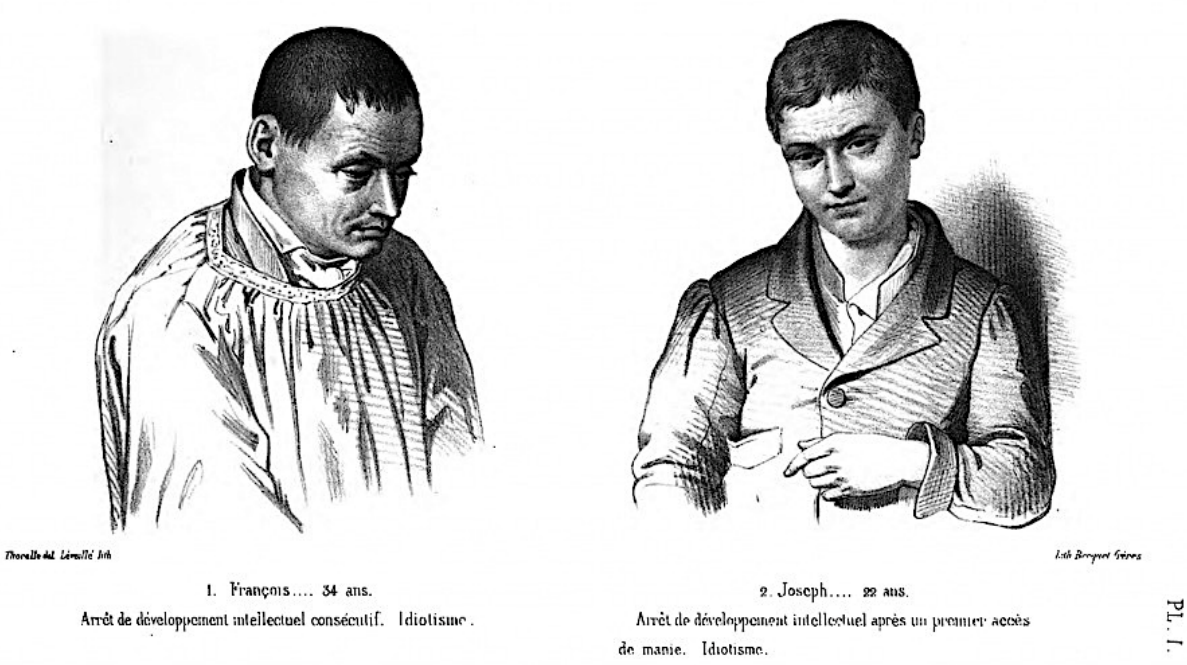

Figure I.1 No. 1, François, 34 years old, and no. 2, Joseph, 22 years old, arrested intellectual development, B. A. Morel, *Traité des dégénérescences physiques, intellectuelles et morales de l'espèce humaine* (Paris: J. B. Baillière, 1857) Plate 1. Public Domain.

One of the earliest to theorize how evolution was Janus-faced was Darwin. In *On the Origin of Species,* he clearly stated how extinction comprised the other face of natural selection:

> The extinction of species and of whole groups of species, which has played so conspicuous a part in the history of the organic world, almost inevitably follows on the principle of natural selection ... Extinction and natural selection ... go hand in hand. [10]

Exactly how this happened niggled him throughout his life. Just before he died in 1881, Darwin voiced his concern that a deep understanding of the causal conditions still remained conspicuously absent in scholarship. "I have realized over the last twenty-five years that the key gap in our thinking is the nature of extinction", he confessed.[11]

Rather than extinction being sudden, as proposed by such catastrophists as Georges Cuvier, Darwin regarded it as slow but sure. "Species and groups of species gradually disappear, one after another", he explained, "first from one spot, then from another, and finally from the world."[12] A staunch proponent of Gradualism, like his close friend, the Uniformitarian geologist, Charles Lyell, Darwin not only disputed the sudden disappearance of a mass of species during the Cretaceous and Palaeozoic periods but also considered that it arose from ignorance infested with cataclysm paranoia. "So profound is our ignorance, and so high our presumption, that we marvel when we hear of the extinction of an organic being", he wrote, "and as we do not see the cause, we invoke cataclysms to desolate the world, or invent laws on the duration of the forms of life!"[13]

In *On the Origin of Species,* this extinction of species was posited by Darwin as the inevitable outcome of natural laws mostly pertaining to "natural selection", and from its fifth edition in 1869, his concept of "survival of the fittest". "The inhabitants of each successive period in the world's history have beaten their predecessors in the race for life, and are", he explained, "insofar, higher in the scale of nature."[14] While the disappearance of "species" or "inhabitants" unable to compete "in the race for life" was also conceived as a natural process that occurred gradually, in *The Descent of Man, and Selection in Relation to Sex* and *The Expression of the Emotions in Man and Animals,* Darwin theorized how the intervention of humans into evolution could lead to mass

extinction, as verified by the outcomes of colonization, particularly the impact of Western imperialism upon indigenous people. Once his theories were correlated with the accumulating evidence of decline and degeneration, they helped to shape a discourse and culture of catastrophism around the fin-de-siècle of the nineteenth century comparable in many ways to the discourses of catastrophism of the sixth mass extinction around the fin-de-siècle of the twentieth century. The formation of this discourse and culture by first publication of *On the Origin of Species* until 1930 forms the chronological framework of this book. This period has been aptly called "the golden age of Lamarckism", as will be revealed in many of its chapters and its Conclusion.[15]

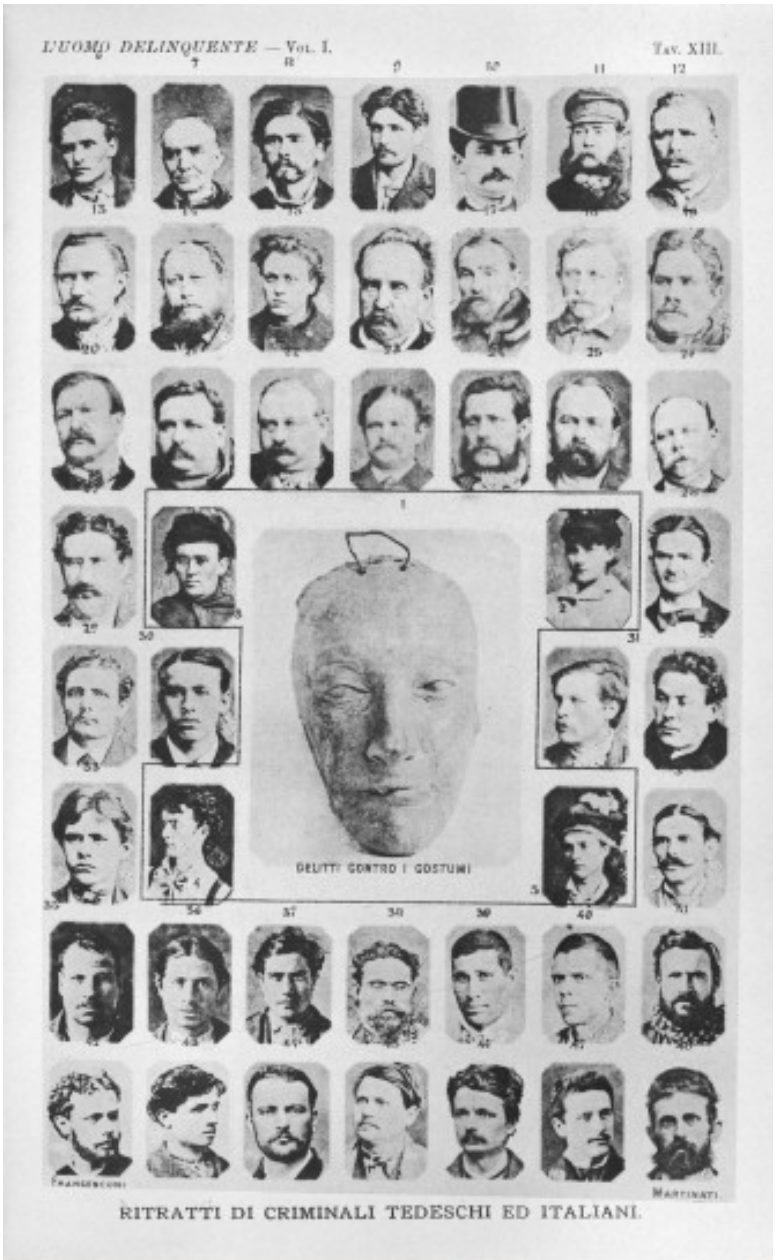

Figure I.2 Forty-seven Photographs of criminals, with a mask in the centre; Cesare Lombroso, *L'Uomo Delinquente,* Turin: Fratelli Bocca Editori, 1889, Volume I, Table XIII. Wellcome Images L0030261.

Just before the first publication of *On the Origin of Species*, a wide range of European evolutionary scientists, criminal anthropologists and medical psychiatrists had begun to notice a profound paradox: Although European science, economies and indeed civilization appeared to be progressing, more and more individual illnesses and pathologies were reported. Two years after Bénédite-Augustin Morel provided plentiful documentation in both image and text of cretinism in

low-lying areas of France in 1857,[16] (Fig. I.1) Cesare Lombroso did so in Lombardia.[17] Morel's images and Lombroso's photographs with measurements of the hollowness in skulls of notorious criminals in Italy, as demonstrated by his illustrations for *L'Uomo Delinquente* (Fig. I.2), was seized upon as a link between criminality and atavism, and as an explanation for the increase in criminality.[18] Following the Western concept of the transparent body in which its exterior was presumed to be a reflection of its interior state, both Morel and Lombroso searched for tell-tale marks of this devolution upon the outer body.[19] Morel detected them in squint eyes, harelips, webbed fingers, flat palates, twisted limbs, distorted ears and asymmetries in the two halves of the face and cranium. Since these marks seemed to leave an indelible stain that betrayed their devolution, Morel called them "stigmata" and linked them to the condition he called "degeneration".[20] Published two years before publication of Darwin's *On the Origin of Species,* Morel defined this condition in his *Traité des dégénérescences physiques* as: "A degeneration and morbid or sickly deviation from a primitive or normal type of humanity."[21] At its most extreme, this deviation meant that a particular social group, tribe or race would no longer be able to propagate and would therefore be doomed to extinction. To regenerate France, Morel postulated a Lamarckian solution of breeding out "dégénérescence héréditaire" through judicious procreation. Nevertheless after the Franco-Prussian War and the Commune, his successors were far less optimistic.

By the end of the French Commune, the first volume of Darwin's *The Descent of Man* had been translated.[22] In the chapter devoted to extinction, "On the Races of Man", Darwin acknowledged that had it been long speculated that races had undergone partial or complete extinction following plagues, famines or such natural catastrophes as hurricanes and volcanic eruptions. Yet he pointed out that extinction did not arise solely from cataclysmic events or environmental change. The survival of the Terai at the foot of the Himalayas and the Fuegians at the southern-most tip of America − whom Darwin had encountered on his *Beagle* voyage − revealed a facility amongst diverse races to withstand environmental conditions hazardous to their existence.[23] Elaborating his theory of "natural selection", Darwin deduced that extinction mostly followed from competition between tribes and races, the fittest being the ones that survived. Their fitness did not just depend upon their good health and vigour, but their fertility, their numbers, and most of all upon what Darwin called "the grade of their civilization".[24] It was due to these factors that Darwin considered those he called "modern civilized nations" had been able swiftly to overcome the indigenous peoples of Australia and New Zealand. "When civilized nations come into contact with barbarians," he explained, "the struggle is short."[25] However, the two most potent of all causes of extinction were, he claimed, "lessened fertility" and "ill-health".[26] "Decreasing numbers will sooner or later lead to extinction", he warned.[27]

This "doomed race" theory seemed to be only corroborated by the impact of Western colonization upon indigenous peoples, such so-called "vanishing races" as the Australian Aborigine and the New Zealand Maori appearing to fulfill Darwin's prophecy that technologically advanced civilizations had a fatal impact upon so-called "inferior" ones. The pictorial articulation of this "doomed race" theory is unravelled in the first chapter of this book by Sarah Thomas. Scrutinizing the allegorical paintings of indigenous peoples painted in the middle of the nineteenth century by Eugene von Guérard in Australia and by Albert Bierstadt in North America, Thomas reveals that both of these academically trained painters were aware of the urgency of capturing these races before it was too late. Following the ways in which the indigenous people depicted by these painters had been mythologized as "doomed to die", Thomas points out that they were either conspicuously absent from their paintings of the American and Australian landscape or submerged within deep melancholic shadow, as if on the verge of disappearing through self-extinction rather than through bloody conflicts and colonial agency. Locating these paintings as "poised on the cusp" between the theories of Alexander von Humboldt and Darwin, Thomas concludes that they "actively participated in the type of extinction discourse that ultimately - if often unwittingly - served to justify the unparalleled global decimation of indigenous peoples in the colonial era."[28] At the same time, the propensity of European nations to evolve was being closely scrutinized, particularly after the Franco-Prussian War.

Since "survival of the fittest" seemed to be demonstrated by the Franco-Prussian War, it was the first world conflict to be interpreted in Darwinian terms.[29] Although Mary Hunter points out in Chapter Three that Louis Pasteur believed France's defeat was largely due to the lack of State support for science and technology, the cause was linked by France's population demographer, Dr. Jacques Bertillon, to its waning fertility, declining birthrate and decreasing numbers.[30] Following *The Descent of Man,* the defeat was also directly linked to the unfitness of French soldiers, as well as their lesser numbers, by comparison to the greater "vigour" and "good health" of German soldiers.[31] In Darwinian terms, Prussia had proven to possess a higher "grade of civilization".[32] By no means was this anxiety dissipated with the formation of the Third Republic, most French conscripts being found unfit for military service.[33] Not only did this generate a crisis in masculinity and virility but it also compounded a widespread diagnosis of the French race as a spent force.[34] When France's defeat at the hands of the Germans was diagnosed through Darwin's theories articulated in *The Descent of Man,* it was easy for commentators to conclude that France showed all the requisite signs of a civilization in decline as confirmed by the Commune.

Figure I.3 Eugène Girard, *La femme émancipée répandant la lumière sur le monde,* 1871; lithograph reproduced in Series J. Lecerf, No. 4. Musée Carnavalet, Paris.

The analogies often drawn between the violence under the Commune and the bloodshed during the Reign of Terror in the First Republic revealed a deep-seated fear of a barbaric regression. While the mass culture of the Commune was identified with the degeneracy of wild animals and hysterics, those male Communards deemed responsible for this regression were bestialized, as illustrated by the fate of the notorious Realist painter, Gustave Courbet who, as Director of Art, was held responsible for the dismantling of the Vendôme Column.[35] Female communards, particularly the notorious "petroleuses", fared no better, being satirized as hysterics ready for hospitalization or indeed asylumization at Salpêtrière.[36] Given the large numbers admitted to the Salpêtrière Neurological Clinic by Jean Martin Charcot from the beginning of the Third

Republic,[37] they were also stigmatized as irrational, sexually depraved and hysterical, as illustrated by Eugène Girard's cartoon (Fig. I.3). Portrayed as screaming while running with their hair raised and their eyes ablaze, Girard's "petroleuses" or "emancipated woman" as he ironically calls her, is literally following the pun of the title, throwing light on the world. Since this visual culture reinforced sensationalist press reports of the Communard's transformation of Paris into a veritable inferno, they were instrumental in spawning a fear of savage depravity, barbaric destruction, degeneration and devolution. None theorized this fear more articulately than the philosophical naturalist who lectured on "natural selection" at the Ecole des Beaux-Arts, Hippolyte Taine. In his six-volume history, *The Origins of Contemporary France,* Taine linked this era of insurrection and barbaric regression to a deep national malaise: Self-destruction and racial degeneration.[38]

In his endeavour to explain this upheaval in Darwinian terms, Taine surmized that those French citizens who had become intoxicated with the fervour of revolution had devolved much further back through the stages of evolution to the most savage state of all "ape-like creatures" notorious for their plundering; i.e. the baboon.[39] As Taine writes:

> From the peasant, the labourer and the bourgeois pacified and tamed by old civilization, we see all of a sudden spring forth the barbarian, and still worse, the primitive animal, the grinning, sanguinary, wanton baboon, who chuckles while he slays and gambols over the ruin he has accomplished.[40]

As he found no difference between them and the invaders of the Roman Empire in the fourth century, Taine dramatically concluded that "the Huns, the Heruli, the Vandals and the Goths will come neither from the north, nor from the Black Sea; they are in our very midst."[41] Following the legacies of Darwin and Georg Hegel, Taine insisted that it was time for his generation to judge itself according to "race-milieu-moment": Its own time, its environment and most of all, its fitness as a race.[42] They had to try to fathom whether the violence committed during times of insurrection, when each was prepared to choke, stab and dismember their neighbours, had emanated from either a mob mentality theorized as crowd psychology by Gustave Le Bon, or from a far deeper malaise. Scrutinizing how France had performed as a race from the 1789 revolution until the 1870 Commune was essential, according to Taine, in order to ascertain whether through hereditary factors the French race was destined to devolve to its bloodthirsty Gallic roots. In light of research published by Paul Broca into polygenism and the evolution of the French brain, and most of all by Darwin about the struggle for life in *On the Origin of Species,* Taine's generation had to assess whether they were even capable of evolving as a race. The ramifications of Taine's theory upon the picturing of atavism after the Commune is explored in the second chapter of this book by Isabelle Havet. There she reveals how and why Fernand Cormon's monumental painting, *Cain*, substantially departs from the Biblical narrative to convey the Janus face of evolution (Fig. 2.1) and disrupts the forward-moving progression captured in Thomas Huxley's illustration of the evolution from gibbon, orang-utan, chimpanzee and gorilla to man (Fig. I.4)

Painted in the aftermath of *la semaine sanglante* that ended the Commune, when thousands of French men and women slaughtered one another, the depiction of Cain murdering his brother would have struck a dissonant chord within French collective memory. Cormon's referencing of such bloody battles signalled man's potential to revert to barbaric, violent behaviour against even the closest of kin. Havet elucidates the reasons why Cormon rejected Christian morality in order to show that rather than fleeing from the wrath of Jehovah, the first murderer and his progeny appeared in primordial lands, as if emerging from their nebulous animal past. In seeming to depict the generations spawned by Cain at different stages of evolution, Cormon was denounced for violating the so-called natural order and reducing painting to an "an anthropology lesson". Yet although the bodies appear bestialized as "simian types", Havet points out they are far removed from the diagrams of either Thomas Huxley or Paul Broca showing Homo sapiens and primates evolving gradually from a common ancestor (Fig. I.4). Rather than representing the progressive stages of human evolution from the least-evolved Neanderthal to the most-evolved Homo sapiens, Havet considers that the range of physiognomies captured by Cormon in a jumble of bodies and craniums conveys the "infinitely variable" process of transmutation and the imminent possibilities

of devolution. These possibilities seem to be embodied in the double identity in which Cormon inscribed *Cain:* He is either a solitary wanderer excoriated from his community due to his manic destructiveness, as signified by the right-hand side of the painting, or he is a prophetic leader like Vercingétorix (Fig. 2.7) able to unify a community and to facilitate its racial evolution through Solidarism, as signified by the youngest member of the tribe on the lap of its mother − a pale-skinned, golden-haired child.

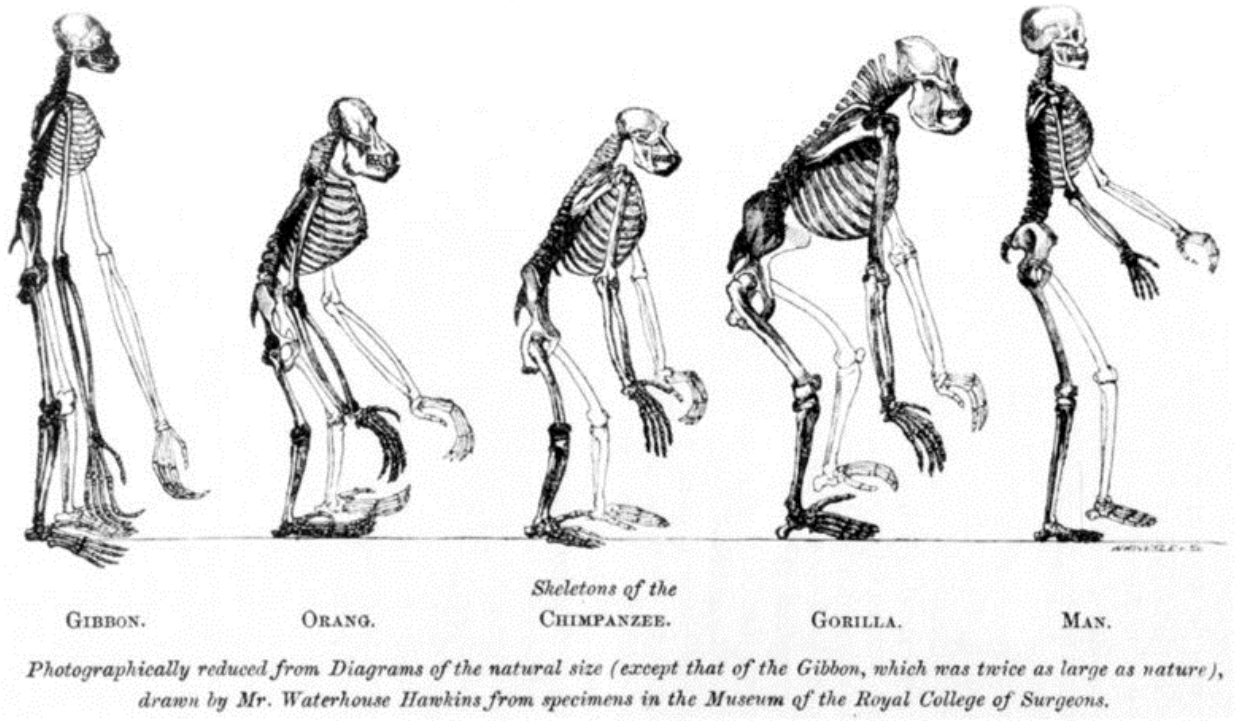

Figure I.4 Waterhouse Hawkins, Frontispiece, Thomas Huxley, *Evidence as to Man's Place in Nature* (London: Williams and Norgate, 1863); Public Domain.

Cormon's anthropological details seemingly respond to the French mania for excavating its prehistory from France's Stone Age as well as Broca's craniometrical classifications of French evolutionary brain types. Yet the juxtaposition of Cormon's Stone and Iron Age artefacts and tools, with diversely evolved craniums and physiognomies, ultimately engages, according to Havet, Taine's insistence that French citizens reassess their potential to evolve as a race − not just in light of Darwinian models of history but Neo-Lamarckian ones in which environmental and hereditary factors prevail. With *Cain* displayed when full-amnesty for Communards was being heatedly debated in the Chambre des Députés, spectators at the 1880 Salon were then faced with the choice of adhering to one of the two evolutionary models in which Cormon inscribes Cain.[43] They could degenerate and devolve to the "primitive" bloodthirsty Gallic warrior pictured separated from his tribe who, like Cain, was prepared to destroy his brother and who, like the Communards, would be exiled from their homeland for doing so. Alternatively they could evolve and regenerate the French race through Neo-Lamarckian collaboration and cooperation. With the prospect of devolution, degeneration and extinction looming large, regeneration seemed to be France's only hope of survival, particularly as theorized by Neo-Lamarckian evolutionists. Hence although Darwinian evolutionary theory has been privileged in much of the literature on this period, such historians of science as Peter Bowler, Richard Burkhardt, Pietro Corsi and Robert Richards, as Serena Keshavjee stresses in Chapter Four and as I establish in Chapter Seven, have long shown that the dominant evolutionary theories at this time were drawn from Jean-Baptiste Lamarck.

"The power of life": Jean-Baptiste Lamarck and Neo-Lamarckism

During the Moral Order Regime that followed the Commune when "Church, Monarchy and Military" were extolled and Creationism taught, the publication and education of evolutionism was banned in France, as is elaborated in Chapters Three, Four and Seven.[44] While French translations of *The Descent of Man* and *The Expression of the Emotions in Man and Animals* had been published in 1873, as well as a new edition of Lamarck's *Philosophie Zoologique,* it was not until 1876 that Darwin's *The Movements and Habits of Climbing Plants* was translated. Between 1878 and 1882, it was followed by *The Fertilization of Orchids by Insects, The Structure and Distribution of Coral Reefs, The Effects of Cross and Self Fertilization in the Vegetable Kingdom, Cross Fertilization of Flowers, Different Forms of Flowers, The Power of Movements in Plants*, and *Insectivorous Plants*.[45] For such French scientists as Alfred Giard, Marie-Yves Delage, Felix Le Dantec, Jean de Lanessan − the close associate of Pasteur − and Perrier, *The Descent of Man* provided a valid theory to account for France's defeat, its declining natality and escalating degeneracy.[46] At the same time, as I argue in Chapter Seven, Darwin's later work provided important tools to determine evolution and regeneration of the French race, especially when fused with the theories of Lamarck to forge Neo-Lamarckism.[47]

Figure I.5 Léon Fagel, Jean-Baptiste de Lamarck: "A Lamarck / Fondateur de la doctrine de l'evolution", 1908, bronze sculpture on sandstone plinth, Place Valhubert entrance of the Jardin des Plantes in Paris. Public Domain.

When the Jardin du Roi was reorganized during the French Revolutions and became in 1793 the Muséum national d'histoire naturelle, Lamarck was appointed as a professor and asked to analyse the organisms of invertebrates. On the basis of this research, he rejected Georges Cuvier's concept

of extinction arising from cataclysmic geological events and instead developed a model of gradual evolutionism that Corsi has aligned with Charles Lyell's uniformitarian principles of geology.[48] Lamarck also developed his theory on the spontaneous generation of life through the influence of the natural environment. From his investigations of the production of the simplest forms of life in nature, he deduced that all other forms of life could be produced and altered by nature in terms of organic mutability and organic diversity. As he put it in 1802:

> Once the difficult step of admitting spontaneous generation is made, no important obstacle stands in the way of our being able to recognize the origin and order of the different productions of nature.

To account for organic diversity, Lamarck developed a two-pronged theory of Transformism, entailing first "the power of life" to generate a greater complexity in the evolution of species through the dynamics of vital fluids, and second, the use and disuse of organs in relation to the environment and the ways in which their use could become habits or acquired characteristics that could be inherited.[49] "Great alterations in the environments of animals lead to great alterations in their needs, and these alterations in their needs necessarily lead to others in their activities", Lamarck explained. "Now if the new needs become permanent, the animals then adopt new habits which last as long as the needs that evoked them."[50] Hence instead of the structure and diversity of species being the result of Darwin's "natural selection", "survival of the fittest" or "sexual selection", Lamarck held that they arose from habit, which had in turn emanated from adaptation to the environment, as Lamarck explained:

> It was not the body and its parts that give rise to habits, to the way of life of animals, but on the contrary it is the habits, the way of life and all the influential circumstances that have with time established the form of the bodies and the parts of animals. With new forms, new faculties have been acquired and little by little nature has arrived at the state where we see her now.

Due to the constant transmutation of species within their environments, Lamarck was sceptical about widespread extinction having occurred in the earth's history.[51] At the same time, given his acute awareness of the increasingly deleterious impact of humans upon nature by 1817, this did not prevent him from foreseeing mass extinction: "One would say that man is destined to exterminate himself after having rendered the globe uninhabitable."[52] During his lifetime Lamarck well recognized the possibilities of devolution, particularly as he envisaged that the transmutation of species could lead to the downfall of "perfect" organisms and trigger a degenerative spiral.[53] While he theorized how organs could be strengthened through use to become distinctive characteristics, he also recognized the converse of this theory that when weakened due to disuse, they could disappear. Although the inheritance of beneficially acquired characteristics or traits could facilitate the regeneration of species, Lamarck acknowledged that the inheritance of negative traits could lead to their degeneration. Hence instead of evolution and extinction comprising the Janus face of Lamarckian theory, regeneration and degeneration did so, as was well recognized by Neo-Lamarckians.

In fusing this aspect of Lamarckism with Darwin's theories of extinction, Neo-Lamarckians considered that while degeneration could lead to the extinction of a race, conversely regeneration could lead to their evolution, particularly through the inheritance of positive traits or beneficial characteristics.[54] Instead of this occurring through competition between individual and diverse species, Neo-Lamarckians stressed that this could only happen through their harmonious association and cooperation. When the figure of Cain pictured by Cormon is then placed within this discursive formation of Neo-Lamarckism, it may then be read also as an allegory of the French Republic poised between rivalrous destruction and Solidarist cooperation. In striking such an uplifting note amidst the cacophony of catastrophist discourses, the Lamarckian concept of regeneration proved enormously appealing in France as elsewhere. As Richard Burkhardt explains:

> The idea of the inheritance of acquired characters had great breadth of appeal in the last decades of the nineteenth century and the early decades of the twentieth century. This appeal cut across both national and

> disciplinary boundaries, and it drew support from philosophical and social considerations as well as scientific ones... The Lamarckian position was supported in England, France, Germany, Austria, Switzerland, Italy, Russia, and the United States by embryologists, paleontologists, physiologists, bacteriologists, and plant geographers. It seemed to fit well with the embryologist's assumption that ontogeny recapitulates phylogeny, with the paleontologist's fossil sequences that seemed to display the accumulated effects of use and disuse, with the physiologist's interest in causal rather than statistical relationships, with the bacteriologist's understanding of the bacterium's adaptation to environmental change, and with the plant geographer's data on the geographic variation of forms.[55]

Through Darwin, Lamarck was chauvinistically reinstated by French scientists as the "greatest" of all evolutionists who had guided Darwin.[56] So highly esteemed did his theories become in France through Darwin that paradoxically they lead to what Peter J. Bowler has called "The Eclipse of Darwinism"[57], a term which Mark A. Largent has modified as an "interphase".[58] In France, as Stuart M. Persell surmizes, "Darwin vindicated the lost Lamarck."[59] This was crystallized by the inscription, which can be glimpsed in Fig. I.5 on the statue of Lamarck commissioned by Perrier and erected in 1909 outside the Muséum national d'histoire naturelle: "Founder of the doctrine of evolution".[60] Yet those who developed Neo-Lamarckism, according to Stephen Jay Gould, "reread Lamarck, cast aside the guts of it (continuous generation and complicating forces) and elevated one aspect of the mechanisms – inheritance of acquired characters – to a central focus it never had for Lamarck himself."[61] A fusion of Lamarck's 1809 treatise, *Zoological Philosophy* with Charles Darwin's evolutionism, the new Lamarckism entailed the transmutation of species through cultural intervention and environmental action.[62] As distinct from the competitiveness and rivalry inherent in Darwin's theory of "survival of the fittest" that appeared in his 1869 publication of *On the Origin of Species,* Lamarck's Transformism struck a quixotic chord amongst Republican Progressists and Solidarists striving for cooperation rather than competition, altruistic association rather than egotistical rivalry and the transmutation rather than elimination of low forms into higher species.[63]

In its emphasis on association, cooperation and the need for individuals to cohere in social groups like a natural organism, this new interpretation of Lamarckism justified Republican Solidarism. While Lamarck was mythologized as having conceived a Solidarist vision, his theory of Transformism was highlighted as an evolving culture in which humans could control evolution by controlling the environment. Neo-Lamarckism then seemed optimistic in its prospects for change, democratic in its applicability to all and Republican in confirming the need for health and social reform corroborated by Lamarck's oft-quoted statement in his *Power of Life:* "… movements, which constitute active life, result from the action of a stimulating cause that excites them."[64] Offering a theory explaining how psychological changes of habit, physiological reuse of organs and recontrol of the environment could lead to biological evolution and cultural transformation, Neo-Lamarckism was latched onto by French Radical Republicans as a positivist justification for their programmes of secularization, scientificization and corporeal regeneration.

"Between 1870 and 1940", concludes Michel Morange, "many of the most influential French biologists were neo-Lamarckian."[65] By 1890, such Neo-Lamarckians as de Lanessan, Delage, and Giard reigned within the faculties of the Sorbonne, as they did at the Muséum national d'histoire naturelle and the Chambre des Députés, as illustrated by Lanessan's election in 1881, from whence they lobbied vigorously for expansion of the scientific establishment.[66] Despite a challenge to its viability posed by August Weismann in 1883, and the apparent validation of germ plasm heredity in 1900 by the rediscovery of Mendel's Laws, Neo-Lamarckism in the form of Transformism remained the dominant model of evolutionary regeneration throughout most of the Third Republic.[67] As Laurent Loisen elucidates, French Neo-Lamarckism was driven by a specific project − that of rendering the Transformist hypothesis scientific, particularly through "experimental transformism".[68] The direct effect of the environment and the inheritance of acquired characteristics found support not just in the research of scientists, naturalists, zoologists, physiologists, physicians, obstetricians, but also biologists and such microbiologists as Louis Pasteur, the subject of Chapter Three, whose students included Le Dantec. The more the French race seemed to degenerate and the more the Republic seemed to be in crisis, the more Lamarck seemed to be

extolled as a benevolent evolutionist and regeneration asserted as a national imperative, as illustrated by Le Dantec's articles on Neo-Lamarckism regularly published in *La Revue blanche* and *La Revue de Paris* from 1897. Yet, as indicated by the numerous countries listed by Burkhardt, by no means was France the only nation in which Neo-Lamarckism was avidly pursued. As Pat Simpson also exposes in Chapter Eight, Neo-Lamarckism was integral to the discursive formation of evolution and regeneration in both pre and post-Revolutionary Russia, a statue being commissioned from Vasilii Vatagin in 1921 on the subject of *Blind Lamarck and his Daughters* (Fig. 8.3).

"The dusk of nations": Rampant Degeneration at the fin-de-siècle

In the wake of France's military defeat and the social turmoil generated by the Commune, Valentin Magnan, the psychiatrist of Émile Zola's *L'Assommoir,* had psychopathologized degenerescence. In his nosological system of classification, Magnan had distinguished far more types of pathological degeneracy than Morel*,* ranging from the Agoraphobic and Arithmomanic to the Onomatomanic and Zoomanic. Far from conceding the possibility of regeneration, let alone the prospect of countering the prospect of degeneration through breeding, Magnan considered that the reverse had happened, particularly as he found pathological degenerates generally procreated with one another, leading to "the reproduction of certain types even more defectuous".[69] Capturing the fears of many, the discourses of degeneration shifted from those of individual pathologies to the social types identified by Magnan and finally to a societal disorder.

By the last third of the nineteenth century, degeneration became what Daniel Pick calls "the condition of conditions", used to explain every physiological, pathological, social and political disaster.[70] A kaleidoscope of new medico-psychiatric taxonomies and sociological paranoia, by the fin-de-siècle degeneration purportedly encompassed alcoholism, cretinism, dwarfism, hysteria, neurasthenia and syphilis; agoraphobia, algaphobia, arithmomania, claustrophobia, coprolania, dipsomania, exhibitionism, kleptomania, necrophilia, nosophilia, nosophobia, nymphomania, ononamatomania, pyromania, pyrophobia, syphilaphobia and satyriasis, suicide, poverty, strikes, criminality, anarchism, feminism, decadent literature and Modernist art.[71] With escalating depopulation and rampant degeneration documented in most Western nations, the prospect of their devolving to the point of extinction was regarded as imminent by the fin-de-siècle. This festering paranoia was articulated most dramatically, if not neurotically, by the German physician based in Paris, Max Nordau.

Significantly the first of five books in Nordau's treatise, *Entartung,* first published in 1892 and immediately translated into English as *Degeneration* (1895), was entitled "Fin-de-siècle: The dusk of nations".[72] His choice of this metaphor was designed to indicate that Western nations were in the twilight zone of their evolutionary cycle. This was signified by the disposition of Europeans Nordau encountered at the fin-de-siècle exuding what he described as "a compound of feverish restlessness and blunted discouragement, of fearful presage and hang-dog renunciation".[73] Nordau found it was also characterized by a mood in metropolitan cities that was palpable to "the impotent despair of a sick man, who feels himself dying by inches in the midst of an eternally living nature blooming insolently forever."[74]

Championing the publications of Lombroso, particularly *L'Uomo delinquente* (Fig. I.2) – not insignificantly translated in English as *The Born Criminal* − Nordau found this morbidity manifest by the huge increase in criminality.[75] In light of the treatise on *Psychpathia Sexualis* by Richard von Krafft Ebing, he considered it also manifest by the prevalence of sexual fetishism.[76] Following the neurological research into hysteria by Charcot and particularly J. Roubinovitch's work on male hysteria,[77] Nordau considered that it was also demonstrated by the increasing numbers of male and female patients at Salpêtrière diagnosed as neurasthenic and hysterical. "Degenerates, hysterics, and neurasthenics are not capable of adaptation", he declared. "Therefore they are fated to disappear."[78] Yet more than anything else, Nordau found this degeneracy manifest by the incessant craving for novel and decadent sensations at the fin-de-siècle inflamed by avant-garde artists.

Those chapters of this book that focus upon degeneration deconstruct this specious argument.

The prospect of France's rapid devolution was only exacerbated, as Hunter reveals in Chapter Three, by such seemingly incurable diseases as Rabies and their links to pathological degeneracy, particularly as those bitten by mad dogs were invariably reported as having been transformed into convulsive beasts that foamed at the mouth. Its impact upon women was also meant to turn them into sex addicts. Due to these symptoms of bestiality and hyper-sexuality, Hunter demonstrates how Rabies was perceived as yet another signifier of degeneration in France spawned within the "sick" modern city. This was why, Hunter argues, when Louis Pasteur identified the Rabies microbe and found its cure in 1885, he was pictured at the 1886 Salon by Léon Bonnat (Fig. 3.1), Albert Edelfelt (Fig. 3.2) and Laurent Lucien Gsell (Fig. 3.3) as the rational man of science and saviour of humanity able not only to help rescue the world from extinction but also able to regenerate the French race. Even though, as Hunter illuminates, paradoxically the fear of Rabies was always far greater than its actual threat, the phobia of dehumanization and becoming animal was not just prevalent in France but, as Oscar E. Vázquez reveals in Chapter Six, it was also rampant in fin de siglo Spain.

Just as France's defeat by the Prussians left a searing scar on the French psyche, so Spain's defeat by America in the *Guerra hispano-estadounidense* left the Spanish nation profoundly shocked and humiliated, particularly once America claimed indefinite control of Cuba, Puerto Rico, Guam and the Philippine Islands. Amidst dismay and disillusionment, the *Generación del 98* was formed. This group of novelists, poets and philosophers was critically analysing the moral political and cultural crisis ensuing from this disaster when Carles Mani y Roig embarked upon the sculpture, *Els Degenerats (The Degenerates)* Fig. 6.1 – the focus of Chapter Six. Like Havet who illuminates in Chapter Two how Cormon's *Cain* may be construed as an allegory of the French Third Republic caught between two evolutionary poles, Vázquez reveals how Mani's sculpture may be read as an allegory of the Spanish nation facing degeneration and devolution at the fin de siglo, particularly in light of the Spanish translation of Nordau's *Degeneration* and its publication in 1902. Rather than Mani conveying the degeneration of his couple through their devolution to a previous human evolutionary state, like Cormon's picturing of Cain as Cro-Magnon man, Vázquez points out that in keeping with Mani's original title for this sculpture, *Embrutecimiento* − meaning both brutalization and stultification as well as the act of becoming an irrational animal − they have been dehumanized as simian.

The slumped postures and stupefied listlessness of Mani's couple seem comparable to the males chosen by Morel to illustrate degeneration (Fig. I.1). Yet drawing upon the American studies of Neurasthenia conducted by George Beard, as well as those done by Gilles de la Tourette in Paris and Vicente Otis y Esquerdo in Spain, Vázquez considers these characteristics as symptomatic of this nervous disorder. Yet while both Mani's figures appear to suffer Neurasthenic exhaustion and melancholy, they also seem impotent without courage or willpower. Vázquez points out that this was exactly the definition of degenerates and mad people in 1900 provided by the physician Mateo Bonafonte, head of the Zaragoza asylum in Spain. Far from this condition being isolated to particular cases in Spanish asylums, Vázquez reveals that once aligned with increasing awareness of Spain's depopulation, the entire nation was psychopathologized as suffering from a "collective aboulia" that had left it lifeless "without a pulse". Placed within this discursive framework, Vázquez concludes that Mani's simian humans were intended to signal the danger of the Spanish population devolving to bestial states. That the representation of simians was not always meant to be devolutionary is revealed in Chapters Seven and Eight. In Chapter Eight Patricia Simpson explores the evolutionary significations triggered by the simians depicted in Vasilii Vatagin's 1926 sculpture displayed in the Moscow Darwin Museum, *Ages of Life-Age Variability in Orang-utans* (Fig. 8.2).

In pre-Revolutionary Russia, Simpson points out that discourses of degeneration, triggered by Morel's treatise, were as prevalent as they were in fin de siglo Spain. After the 1917 Bolshevik Revolution, Simpson reveals that official discourses were predominantly utopian to propel evolution under socialism to New Soviet Person. Nevertheless with low standards of living

alongside rampant Typhus, Cholera, Dysentery and Syphilis, Bolshevik anxieties about degeneration continually festered, particularly in relation to the survival of socialism. Since lice propelled Typhus affected over 6.5 million people between 1918 and 1920, Simpson points out that this was the medical context for the notorious remark attributed to Lenin by Health Commissar Nikolai Semashko: "Either socialism will defeat the louse or the louse will defeat socialism."[79] With art assigned an official role in developing New Soviet Person, Simpson explores how the anthropomorphised poses and facial expressions of the simians in *Life-Age Variability in Orang-utans* (Fig. 8.2) were designed to be paired with those of humans in his *Ages of Life-Age Variability in Humankind* (Fig. 8.1) in order to signify the superiority of humans over apes as "social animals". As distinct from the smooth skin of Vatagin's Homo-sapiens, the rough surface of the apes was meant to signify their link with raw nature. Nevertheless Simpson perceives that they differ significantly from Vatagin's 1917-1918 sculpture, *Enraged Gorilla* (Fig. 8.8). In depicting the orang-utans in harmonious association with one another, Simpson deduces that Vatagin endeavoured to convey their potential to evolve, particularly through Soviet Darwinian and Lamarckian concepts of cooperation. As signified by the robust baby foregrounded in *Ages of Life-Age Variability in Humankind* (Fig. 8.1), from this cooperation the healthy Soviet New Person would be generated, just as Cormon pictured how the healthy French Republican citizen would evolve nearly half a century earlier. Ending on this point Simpson does not embark upon the ways in which Modernism became branded as devolutionary, degenerate and decadent in the Soviet Union, particularly from the start of Josef Stalin's forced collectivization in 1928. However, Vázquez does briefly explore the conflation of Modernism with degeneration by considering how the devolution embodied by Mani's simians may also be read as a critique of the degenerate and primitive state of Spanish avant-garde art that was not far removed from Nordau's attack upon Modernism.

"Sexual psychopaths" and "Canal dredgers": Modernism as Degeneration

Dissecting the anxieties festering around the concept of degeneration and how they appeared to be manifested by the visual arts is seminal to this book, especially as so much of Nordau's proof of societal decay came from looking at fin-de-siècle avant-garde French artists. Nordau notoriously described the avant-garde gambits of French Modernists as:

> .... the curious style of certain recent painters – 'impressionists', 'stipplers', or 'mosaists', 'papilloteurs' or 'quiverers', 'roaring' colorists, dyers in grey and faded tints - becomes at once intelligible to us if we keep in view the research of the Charcot school into visual derangements in degeneration and hysteria.[80]

Nordau likened the Realists and Naturalists, as epitomized by Émile Zola, to the "sexual psychopaths" documented by Krafft-Ebing. Although Zola decried physiological and pathological degenerescence, those bearing signs of Morelian "stigmata" being stereotyped in his Rougon-Macquart novels as genetically immutable, nationally noxious and ultimately self-extinguishing, his novels were likened by Nordau to "canal dredging".[81] Zola himself was characterized by Nordau as having become so obsessed with olfactory sensations that he had atavized to the state of a sexual pervert with the bestial instincts of a dog.[82]

Although in his later editions of *Degeneration,* Nordau ventured into the twentieth century and acknowledged criticisms made of his thesis, particularly from those that maintained that "degeneration and hysteria are the products of the present age", Nordau doggedly insisted that such neuroses were the result of "vast fatigue".[83] Appearing far more fixated than the avant-garde artists Nordau decried, the very possibility of fin-de-siècle artists picturing many of the forms of degeneration that he attacked, let alone pathologically identifying with them to see beyond the spectacles masking the "sick city", was never acknowledged. Although Albert Besnard's use of primaries was lauded by contemporary critics for their luminosity, Nordau denounced "the screaming yellow, blue and red" of Besnard's colours that can be seen in the illustrations of his Sorbonne murals in Chapter Four by Keshavjee (Figs. 4.1, 4.3, 4.5 and 4.6). Despite the fact that

Nordau became a founding member of the Salon d'Automne incepted to show avant-garde art, including Art Nouveau, he also spurned this movement, as Dandona reveals in Chapter Five.

Although the Symbolists were perturbed, in the words of Sharon Hirst, by "a queasy, sickening feeling that all was not right, that things were in decay and that one could not fit into one's own surroundings",[84] Nordau ranked them as the leading degenerates in Paris. In his chapter devoted to Symbolism, Nordau likened the Symbolist poets to the neurological and hysterical patients treated by Charcot at Salpêtrière and dismissed this movement as "nothing less than a form of mysticism of weak-minded and morbidly emotional degeneration."[85] Far from recognizing the Symbolists' attempts at exposing degeneracy in a moribund society, Nordau maintained:

> They do not link us to the future, but point backwards to times past. Their word is no ecstatic prophecy, but the senseless stammering and babbling of deranged minds, and what the ignorant hold to be the outbursts of gushing, youthful vigour and turbulent constructive impulses are really nothing but the convulsions and spasms of exhaustion.[86]

This is elaborated in his conclusion in which Nordau finally concedes the probability of regeneration in the twentieth century, particularly after degenerates have become extinct. "The hysteria of the present day will not last", he forecast. "People will recover from their present fatigue. The feeble, the degenerate will perish."[87] Just as degenerates would extinguish themselves, so he predicts that avant-garde art would suffer the same fate. "The aberrations of art have no future", he declared. "They will disappear when civilized humanity shall have triumphed over its exhausted condition."[88]

Figure I.6 Bastida y Sorolla's *Sad Inheritance*, 1899, oil on canvas, 210 × 285 cm., Bancaja Collection, Valencia. Public Domain.

However, as so many books on twentieth-century Modernism, including this one, testify, avant-garde art did just the opposite, flourishing rather than dwindling in the twentieth century.

Furthermore many avant-garde artists focused upon degeneration in their artwork. Neither Paul Gauguin, Vincent Van Gogh, Edvard Munch nor Pablo Picasso shied away from depicting the "stigmata" of syphilis. Viewed from this perspective, their imaging of degeneracy was not far removed from such realist paintings, known to Picasso, as Bastida y Sorolla's *Sad Inheritance* (Fig. I.6), awarded at the 1900 Exposition Universelle, in which children "stigmatized" with blindness, Leprosy and Polio were juxtaposed with the healthy seaside bathers of Valencia to signal how they were harbingers of Western decline and racial extinction. Paradoxically what Nordau then failed to fathom was the ways in which paranoia over the danger of devolution that he expressed so sensationally was, in fact, betrayed by the very art and literature that he so denigrated. He also failed to comprehend why so many avant-garde artists championed the "primitive" as a healthy conduit to regeneration, rather than as a manifestation of their own degeneration.

Devolution as Evolution: Anticolonialism, "Primitivism", Naturism and Animalism

One of the prime theoretical underpinnings in the second half of this book arises from the need felt by many artists, writers and intellectuals at the fin de siècle to devolve − as viewed in Social Darwinist terms − in order to be able to go forward and evolve creatively and naturally in communion with other species. That this was not necessarily viewed by them as a backward step but more as a side step or a transgression to a different evolutionary route than the one pursued by anthropocentric industrialists, technological capitalists and investment colonialists, is testified by their explanations. Deeply disturbed by human-driven extinction, resource exploitation, mounting pollution and ecological devastation of the Anthropocene, as well as the anthropocentric divide between what Jacques Derrida calls "the beast and the sovereign", they sought different models of evolution.[89] Instead of arboreal, genealogical, teleological and hierarchical evolutionary theories concerned with origin and selection, they sought those that were lateral and rhizomatic, able to explore symbiotic alliances, transspecies affiliations, symbiogenesis and co-evolution, as offered by a range of Neo-Lamarckians. Since the environment was seminal for Neo-Lamarckians to propitious evolution, their quests for devolution as re-evolution invariably entailed quests for environments alternative to the "sick city" from peasant communities to indigenous colonies where they could grow physiologically, psychologically and creatively. Alternatively they isolated themselves within the "sick city", recreating "primitive" enclaves within their studios with the help of folk or tribal cultures.

By the fin-de-siècle when the rural way of life seemed most threatened by encroaching industrialization, the peasant became increasingly mythologized as non-degenerate and uncorrupted by metropolitan materialism. Posited as an antidote to the pretentiousness of slick "sick city" dwellers, peasants were esteemed for their authenticity, humility and sincerity. As distinct from the transience and impermanence of modernity, the peasant was valued for their rootedness to place. Igniting the "cult of going away" from the rampant degeneracy of the "sick cities" of Europe, artist communities mushroomed in remote parts of Britain, France, Hungary, Russia and Scandinavia with eighteen organized groupings of artists in peasant villages or rural communities in Germany alone by 1900, most notably at Worpswede.[90] Hence while the character of Des Esseintes in Joris-Karl Huysmans' *À Rebours* locked himself away from the "sick city" of Paris to indulge his fetishes, Paul Gauguin found "something savage and primitive" amongst the "rustic superstitious simplicity" of the Breton villagers in Pont-Aven where he could throw off the shackles of progress and feel himself to be in a primal state.[91] Propelled by the Anarchist Communism, Solidarism and Transformism of Reclus and Kropotkin, as well as the heliotherapy associated with the Côte d'Azur, Paul Signac settled in Saint-Tropez. Committed to Regionalist Solidarism and Transformism while conceiving of nature as an endless source of renewal, Emile Gallé refused to work in Paris, as revealed in Chapter Five. Instead he explored new forms of art and botany in his native city of Nancy, the capital of Lorraine, where he could monitor the

symbiotic evolution of the local plants and insects in nature.

Posited in a binary to the oppressive and repressive cultures of technologically industrialized cities, nature became inscribed as a raw and primal antidote to civilization and superficiality, a vitalizer of energy rather than a crucible of neurasthenia, a source of regeneration rather than degeneration that could be both emotionally and creatively liberating. Hence the quest for reparation of man's severed relationship with untrammelled nature was for Rainer Maria Rilke, a means of seeking something meaningful in the midst of uncertainty.[92] For Friedrich Nietzsche, a return to nature and to primitive communities did not represent a turning back but "an ascent" in terms of progress into "the high, free, even terrible nature and naturalness where great tasks are something one plays with … ."[93] For the Anarcho-Communist French geographer, Reclus, examined in Chapters Five and Seven, nature needed to be reconceived as an ecology of place able to guide human habitation without the destructive interventions of capitalism or centralized governments. So significant were "les forces de la nature" for Besnard, as Keshavjee shows in Chapter Four, that in his Sorbonne mural, *La Vie renaissant de la mort,* (Figs. 4.2-4.6), he endeavoured to convey the same Transformist concept of the "life-force" in nature that vitalists and scientists were codifying before 1900. In order to activate Transformism, nature was also microscopically scrutinized by the Ecole de Nancy at the fin-de-siècle, as Jessica Dandona points out in Chapter Five, particularly the mutation of plants to more complex species. The chapters that follow elaborate this nexus between nature, renewal, regeneration and indigenous people.

During the "scramble for Africa" and France's colonization by investment launched in 1885, when indigenous colonized people seemed most vulnerable to extinction, they were also mythologized, if not exoticized in ethnographic museums and human zoos as subjects of Eurocentric projection.[94] Since the so-called "civilizing mission" was connected to the brutalization and exploitation of indigenous people, ranging from slave labour to sexual abuse and contamination by the venereal peril, it had become better known in France as the "syphilizing mission". In their rejection of colonial imperialism and indigenous exploitation, such Modernists as Picasso sought to become uncivilized and separate themselves from any taint of capitalism. Rather than travelling to remote sites in order to become a "modern barbarian" like Gauguin, they gravitated to the so-called "primitive art" of non-Western people, particularly that of the indigenous tribes of the Congo. Despite the Eurocentric curatorial framing of their primitive woodcarvings and tribal objects within ethnographic collections, for many Modernists they seemed the opposite of an unevolved or inferior state of creativity. As an antidote to Academic art, positive empiricism and rationalist materialism, tribal objects resonated, according to Picasso, "against everything" and embodied instinct, intuition, raw experience, spontaneity, sincerity and intense emotion, intensively expressed.[95] So powerful did they seem when Picasso apprehensively entered the Musée d'Ethnographie du Trocadéro, "all alone in that awful museum with the masks ... the dusty mannequins", he vividly recalls experiencing an epiphany.[96]

In his book, *Primitivism in Modern Painting,* it was Robert Goldwater who gave this cult the name of "primitivism".[97] In highlighting the significance of black art and culture to white Modernism, Goldwater openly acknowledged that despite this Eurocentric term, he was reacting against the colonial myth of "the white man's burden" which he found had coloured the Western study of art.[98] By contrast to the 1984 exhibition at MOMA entitled *Primitivism in Western Art* in which "primitivism" was posited by its curator, William Rubin, as a "western phenomenon", Goldwater may then be regarded as a Postcolonialist before Postcolonialism.[99] Goldwater opposed, as he put it, "the generally disdainful opinion of primitive peoples which prevailed throughout the nineteenth century, and which, if it originated in the theory of evolution, was influenced by and useful to colonial programs."[100] Hence Goldwater argued that the subtext of Modernism is "primitivism" with Gauguin's search for primitive sources and societies providing the groundwork for Picasso, leading to his incorporation of African tribal sculpture and Iberian masks into *Les Demoiselles d'Avignon.*[101] Yet groundbreaking as Goldwater's treatise was, particularly given its publication date of 1938 when he married Louise Bourgeois, he did not explore an interdisciplinary model of art and discourses to consider how Primitivist Modernism emerged