

4-29-2014

# Uneasy Hybridity: The Nature and Culture of Science, and its Bioethical Implications in Select Victorian Fiction

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UNEASY HYBRIDITY: THE NATURE AND CULTURE OF SCIENCE, AND ITS  
BIOETHICAL IMPLICATIONS IN SELECT VICTORIAN FICTION

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Philosophy

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Indiana University of Pennsylvania

May 2014

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Title: Uneasy Hybridity: The Nature and Culture of Science, and its Bioethical Implication in Select Victorian Fiction

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This dissertation investigates how the Victorian scientific revolution and its concepts of evolution are represented in select fiction of the period: Mary Shelley's *Frankenstein* (1818), H. G. Wells' *The Time Machine* (1895), *The Island of Dr Moreau* (1896), *The Invisible Man* (1897), *The War of the Worlds* (1898), Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde* (1886) and others.

Starting from the theological and cultural controversies arising from the publication of Darwin's *Origin of the Species*, and the place of Darwin studies in the literary discourse of critics such as Beer, Carroll and Levine, the fiction represented here signifies a more broad reaching study that seeks to specifically identify the more concrete examples of discourse related directly to the science of evolution.

This discourse of evolution envisaged human beings and animals according to a Darwinian scale of being, in which humans could descend to the ape-like creature in *Dr Jekyll and Mr Hyde* while animals could evolve into the kind of human beings described in *The Island of Dr Moreau*. The mobility of the scale though created unease through its challenge to traditional metaphysical hierarchies and the implied de-centering of an anthropocentric model. Therefore, I shall look into how this theory and the consequent unease implicitly or explicitly influenced the works of Victorian writers

and how the theory caused another site of unease, the clash between theologian naturalists and conservatives who would protect the Victorian tradition, culture and religion, and modern scientists who gave discomfort to those belonging to the Victorian conventions through their articulation of unfamiliar scientific inventions and theories. The degeneration theory also could be applied to the idea that those human beings would be likely to be degenerated because of the development of science and the change of environment.

If there was unease concerning ascent and descent, there was also disquiet about other ideas about species indistinction, specifically the existence of the hybrid of human and animal, and inanimate things that are animated by science's interference with them. The presence of these creatures was accelerated by the revolutionary and subversive ideas that the scientists, often called 'mad scientists,' generated in their labs. Their inventive and innovative experiments were enough to disturb Victorian tradition and culture.

Such work in the labs also created an anxiety about the ecological and bioethical roles of the sciences and scientists. Using the ecological and bioethical discourses of Michel Foucault, Gilles Deleuze, and Maurice Merleau-Ponty, I will discuss how the distinct lack of concern expressed by characters in Victorian fiction about experimentation of living organisms anticipates the challenges future scientists will likely face in the midst of the complexity of ecological, evolutionary, and bioethical realities.

## ACKNOWLEDGEMENTS

I would like to appreciate my committee members. My advisor, Dr. Christopher Orchard, patiently encouraged me to reach to the last stage of my dissertation. Without his insightful advice and devoted direction, I would not have completed this dissertation. With reasonable and appropriate comments, Dr. Christopher M. Kuipers and Dr. Michael T. Williamson helped me to have more balanced views on the ideas of the dissertation subject. I would like to also deliver my sincere thanks to the late Dr. Karen Dandurand who had shown her care and compassion when I started my studies first at IUP. My graduation has been anticipated and encouraged by all IUP graduates who teach in Korea. I thank them all, too.

I must express my earnest gratitude to my faculty colleagues of the English department at Chung-Ang University in Seoul, Korea who have supported me to finish the second doctoral degree. Due to their consideration and understanding, I have been able to finalize my degree, continually visiting IUP campus. I would like to express my indebtedness to Professor Chung-Ho Chung and Professor Sook-Hee Cho who had sincerely supported my study abroad in Indiana PA. My thanks also must go to Dr. Seiwoong Oh, Dr. Hun-Shik Kim, Dr. Duk-Young Kim, Dr. Ik-Soon Chung, Dr. Kyung-Soon Yeom, and Dr. Jinbeom Synn as they all have long had interest in my work and encouraged me to finish it.

I must appreciate Dr. Linda Austin who sponsored me to keep working on my research at Oklahoma State University in my sabbatical 2013-2014, and Dr. Elizabeth Williams who kindly informed me of plentiful information of science and medicine. I also thank to Ron Hamilton, a retired IUP librarian at Stapleton Library, and David

Oberhelman and Jao-Ming Huang, professors at the OSU Edmon Low Library. Their kind guidance and help made me feel at home at the libraries.

My sincere thanks should be to my caring mother and mother-in-law who have cared and encouraged me to complete my degree, and also to my father and father-in-law who passed away. They would be very happy in Heaven if they see my graduation abroad. I feel obliged to thank my dear brothers, Jae-Sung, Jae-Hyun, and Sung-Phil who have been always great buttress to the completion of this doctoral degree. Without their consistent, benevolent support and love, I would never challenge this kind of long year work. I also very much appreciate Pastor Myung-Ho Lee's and Hong-Sik Chun's prayers for my study and health, whose power surely sustained me to lead a faithful life and study in health and happiness. Thank God for what you do with me.

Finally, and most importantly, I owe my thanks to my beloved wife Seung-Eun. Her support, encouragement, and quiet patience made me not give up my dissertation. More than two decades since our marriage, I have depended upon her for my study and life. I would pay her back what I owed her during the rest of our life. I also thank my dearest son and daughter, Hyun-Jin and Hyun-Sil, who have cheered me up all the time, patient with me who have been often away during almost every vacation for more than seven years. I love you all, my family.



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## CHAPTER 1

### INTRODUCTION: LITERARY IMAGINATION OF EVOLUTION AND REVOLUTION IN VICTORIAN SCIENCE FICTION

This dissertation focuses on the Victorian scientific revolution and its concepts of evolution represented mainly in select science fiction of the period. This chapter will introduce the development of science in the period, knowledge of which is important to understand the following topics: the background to the advent of evolution theory, the theory's contextual penetration into Victorian novels, the cultural confusion and conflict caused by the rapid development of science.

#### **Darwin's Evolution Theory and Its Cultural and Literary Effect**

Charles Darwin had begun his scientific theory by observing and making notes on the characteristics of fossils in accordance with geological forms and locations:

When on board H.M.S. Beagle as a naturalist, I was much struck with certain facts in the distribution of the organic beings inhabiting South America, and in the geological relations of the present to the past inhabitants of that continent. These facts, as will be seen in the latter chapters of this volume, seemed to throw some light on the origin of species- that mystery of mysteries, as it has been called by one of our greatest philosophers. (Darwin 25, 1962)

He made a summary of important subjects with which he would be engaged in the last part of the introduction in *The Origin of Species*: 'the complex and little known laws of variation,' 'the difficulties of transitions,' 'the subject of Instinct,' 'Hybridism,'

‘the imperfection of the Geological Record,’ ‘the geological succession of organic beings throughout time,’ ‘their geological distribution throughout space,’ and ‘their classification’ (Darwin 28, 1962). Darwin’s works greatly influenced not only contemporary writers, but also the general public. His evolutionary theory, argued in *The Origin of Species* (1859) and *The Descent of Man* (1874), had far-reaching implications, changing a God-centered society to a human-oriented culture. It has been claimed by those such as George Levine that his evolution theory invoked “a new narrative – or set of narratives – that has permanently reshaped Western imagination” (1).

Nevertheless, despite the claims for the originality of his work, as Darwin himself explicates in the preface of *The Origin of Species*, there had been many preceding discourses regarding evolutionary theory. As Anne K. Mellor states, Georges-Louis Leclerc, Comte de Buffon “was the first to discuss seriously such central evolutionary problems as the origin of the earth, the extinction of species, the theory of “common descent,” and in particular the reproductive isolation between two incipient species” (164). And Erasmus Darwin, the grandfather of Charles Darwin was inspired by Buffon, the “father of evolution,” who in his huge *Histoire Naturelle* had “. . . interspersed comments on the progressive “degeneration” of life forms from earlier and more uniform species, often caused by environmental or climatic changes” (293-94).

Erasmus Darwin continued Buffon’s work in *Zoonomia or The Laws of Organic Life* (1794) where he stated that “All warm-blooded animals derived from one living filament. Cold-blooded animals, insects, worms, vegetables, derived also from

one living filament” (505). Darwin argued that being externally stimulated, the filament gains the power to increase and enlarge particular parts of the body, and its new qualitative development is inherited by its descendants. Furthermore, in his *Temple of Nature* (1803), Darwin revealed ideas far ahead of the times, best exemplified by his statement that he “had accepted, on the basis of shell and fossil remains in the highest geological strata, that the earth must once have been covered by water and hence that all life began in the sea” (294). In the footnote of *The Temple of Nature*, he had insisted that “After islands or continents were raised above the primeval ocean, great numbers of the most simple animals would attempt to seek food at the edges or shores of the new land, and might thence gradually become amphibious” (29). Furthermore, he had evolutionary thoughts on many facets of living things to such an extent that he has ever tried to deduce “from the present existence of breasts and nipples in all the males” the fact that “mankind and quadrupeds were formerly in a hermaphrodite state” (53).

As a result, as Mellor concludes, “it was Erasmus Darwin who for English readers first synthesized and popularized the concept of the evolution of species through natural selection over millions of years” (294). Furthermore, Erasmus Darwin’s work was complemented by others. Jean-Baptiste Lamarck, the French biologist, contended in *Zoological Philosophy* (1809) that one living thing hands down what it has acquired for the whole life to its offspring. His mechanistic thought was later interconnected with Charles Darwin’s evolutionary idea that living creatures become adapted to regional and external environments.

Charles Darwin took his grandfather’s ideas and developed them further

through his positivistic and scholastic method. Interestingly, Charles Darwin denied the relationship in his theory between him and his grandfather, thereby contributing to making Erasmus Darwin disappear from the principal chronicles of scientific research. Instead, he emphasized that his research had relied mainly on Thomas Malthus's Population theory and Charles Lyell's geological achievements, specifically his *Principles of Geology* (1830) in which Lyell placed emphasis upon the gradual change in a geological formation and upon the change in kinds of layered flora and fauna and fossils. In other words, "To a Lyellian," like Darwin, "the whole question of the age of certain areas – the times they had been at certain heights and so on – was intimately connected with the nature of the flora and fauna of these areas and with the fossils record" (Ruse 164)<sup>1</sup>.

In addition to the influence of predecessors, Darwin actively sought collaboration with other like-minded contemporaneous thinkers. He claimed that 'Natural Selection,' one of the key concepts in his theory, could be configured with Herbert Spencer's work: "I have called this principle, by which each slight variation, if useful, is preserved, by the term Natural Selection in order to mark its relation to man's power of selection. But the expression often used by Mr. Herbert Spencer of the

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<sup>1</sup> Darwin was strongly influenced by Charles Lyell's geological concepts when he developed his idea of evolution. Darwin "always thought his ideas came half out of Sir Charles Lyell's. . . . This geological uniformitarianism set the pace and scale for Darwin's theorizing" (R. Young 211).

Survival of the Fittest is more accurate, and is sometimes equally convenient” (Darwin 76, 1962). Spenser’s term is referred to as a sense of competition and struggle among the same or different species of individuals, caused by Thomas Malthus’s ruminations about the increase in population size. Darwin explains this further:

A struggle for existence inevitably follows from the high rate at which all organic beings tend to increase. . . . Every being, which during its natural lifetime produces several eggs or seeds, must suffer destruction during some period of its life, and during some season or occasional year, otherwise, on the principle of geometrical increase, its numbers would quickly become so inordinately great that no country could support the product. Hence, as more individuals are produced than can possibly survive, there must in every case be a struggle for existence, either one individual with another of the same species, or with the individuals of distinct species, or with the physical conditions of life. It is the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms. (78)

As the struggle is a natural phenomenon in the fauna and flora world, Malthus’s theory came to be believed as a theory applicable to struggles in all kinds of lives.

As Michael Ruse states in *The Darwinian Revolution*, others’ works about evolution vied for attention with Darwin’s work. For example, *Vestiges of the Natural History of Creation* published anonymously in 1844, but later attributed to Robert

Chambers, “proved immensely popular with the general public, was discussed at length in leading reviews, and provoked invective far more bitter than anything that followed Darwin’s *Origin*” (94).

Nevertheless, it was Darwin’s *Origin* published 15 years later that produced the more vociferous public debate, so that, as Levine has stated: “Darwin is the one whose impact on nonscientific culture is best known, or at least most widely discussed” (1). It is clear that the publication of his work had an immediate impact:

[A]s soon as the *Origin* was published it was discussed at length in leading newspapers, reviews, and other media. Clergymen and other speakers denounced its vile doctrines from the pulpit and the podium, and Darwin’s friends, particularly Huxley and Hooker, praised Darwin and the *Origin* in equally fervent terms. . . . But it cannot be denied that generally the *Origin* sparked an explosion, as controversy swirled around what came to be known as “Darwinism” or, less reverently, the “ape theory.” (Ruse 202-03)

Concerning how Darwin’s *The Origin of Species* has given the Victorian people a popular scientific view of the world and life, Michael R. Page elaborates that *The Origin of Species* became a watershed in the history of modern intellectual history:

The publication of Charles Darwin’s *The Origin of Species* in 1859 is a watershed moment in modern intellectual history. . . . Darwin has become a figure of heroic proportions: on the one hand canonized as a prophet of scientific triumph and on the other vilified as the Devil in

disguise, diverting humankind from God's truth. In popular histories of science the publication of Darwin's theory is often presented as a triumphal moment, a world-changing revelation, when the "truth" of science finally shattered the illusions of a predominantly religious worldview. Finally, there was an explanation for life's origins consistent with the facts of the natural world. (1)

It is certain that Darwin's work on evolution changed people's thoughts about science and the natural world. The aftermath of the work was so powerful that even scientists, clergy, and philosophers tried to revise "natural theology in light of evolutionary theory" and "shared a determination to provide a religious framework for science, even after the publication of Darwin's *Origin of Species* in 1859" (B. Lightman 42). They attempted to understand all of the scientific phenomena or theory as a branch of natural theology, and analyze the natural phenomena from a traditional religious point of view.

There was hostile reaction to this revisionary process. In 1864 for example, pro-Darwinians such as Hooker, Huxley, Spencer, John Tyndall and others insisted on the division of religion and science in reaction to the power of the privileged class represented by conservative scientists, theologians, and other social celebrities, and formed a private club to pursue their goal of influencing the direction of government policy in science and education (Jensen 63). Nevertheless, "The Church and the clergy still had tremendous power. Not only did they control nearly all university posts, but the convention remained (whatever was said in private) that Parliament and the Press all supported Orthodoxy" (Wilson 227). Even after the publication of Darwin's *The*



*Origin of Species*, the main forces of the society based on tradition and religion still tried to analyze the natural phenomena and suggest a religious frame for science studies (B. Lightman 42-43). Conservative scholars of natural theology thought of the radical evolutionary theory as threatening the natural order of things given by God and, as Levine maintains in *Darwin and the Novelists*, as a dangerous element to subvert the present teleological, ontological, and epistemological order of things. In brief, the threat resided in the emphasis on the theory's denial of anthropocentrism and logocentrism:

The rhetoric of the *Origin* reflects the conditions of the dysteleological world it invokes: various, democratic, multitudinous, constantly transforming, intricately entangled. Read carefully, or perhaps with the eyes of a late twentieth-century critic, the *Origin* seems not only to participate in the celebrated "decentering" of humanity; it develops a quiet, erratic, but forceful attack on what we have learned to call "logocentrism." He [Darwin] found that his argument could not be developed unless he radically undercut the tradition that invested language, definition, and idea, with some ultimate and absolute authority. Before Darwin could even begin to make his case, the word "species" itself had to be disentangled from a timeless reality it was supported to represent. (Levine 86)

Challenging absolute authority and tradition, *The Origin of Species* became an interesting issue for talks given to both the general public and intellectuals. In particular, as James Secord exemplifies, "In many circles, for example, Darwin's *On*

*the Origin of Species* began to be widely debated...after Paul du Chaillu returned from Africa with his gorillas” (42). Paul du Chaillu was a traveler and anthropologist who wanted to ascertain the existence of gorillas and the Central African pygmy. In *Explorations & Adventures in Equatorial Africa* (1861), he made four-year (1856-1859) observations of African natives, gorillas, alligators, leopards, elephants, hippos and other animals living in African environment and described in detail what he felt and experienced about their life styles. In particular, he specifically recorded information about primates including gorillas. Invited and sponsored by Richard Owen, he came to London in 1861 and gave the first lecture in England in front of well-known science and policy figures such as Richard Owen, Thomas Huxley, Francis Galton, and England Prime Minister William Gladstone, at Burlington House in Feb 25, 1861 (Reel 107, 113-15). His presence was magnetic: “Paul could hold his children spellbound with his animated tale of encountering the gorilla in the wild” (116). While he gave his talks, two stuffed full-grown adult gorillas were exhibited to the audience:

To take advantage of the influx of social traffic, the Royal Geographical Society opened the doors of its headquarters at 15 Whitehall Place, inviting the public to visit an exhibition of one of Paul’s gorillas. From 3:00 to 5:00 p.m., visitors could stand in front of the brute, whose arms were spread in a posture of fearsome attack. The animal's lips were pulled back to better reveal the teeth, which, according to one reporter, “from their size might fairly be denominated tusks.” The label on the

specimen read, simply: “King.”... More than any animal before or since, the gorilla had become an instant cultural phenomenon, dominating every level of public discourse from the highest of the highbrow to the lowest of the lowbrow. (Reel 128-29)

Such lectures and exhibitions spurred the on-going evolution debate further. Before and after the publication of *The Origin of Species*, the arguments of evolution continued as follows: a series of debates due to the anonymous *Vestiges of the Natural History of Creation* in 1844, the well-known open debate between Huxley and Samuel Wilberforce, the archbishop of Oxford, at a meeting of the British Association of Science in 1860, where Wilberforce asked Huxley whether it was through his grandfather or his grandmother that he claimed his descent from a monkey. He got back Huxley’s answer that “he would not be ashamed to have a monkey for his ancestor, but he would be ashamed to be connected with a man who used his great gifts to obscure the truth” (Sidgwick 433), and Tyndall’s Belfast speech in 1874 as the president of the British Association of Science and as a Darwinian supporter, demanding the division of religion and science.

In particular, conservative theologians and theological scientists had harsh responses to Darwin’s *the Descent of Man* which declared that man was derived from a lower animal form. While Darwin found the similarities of phylogeny between human and animal by comparing their growing embryonic forms, he also perceived the lower organic forms latent in the human body by observing the atavistic mutation that the body occasionally experiences. Such a close examination of the human and animal

body finally led him to claim in *the Descent of Man* that man was evolved from a lower organic animal:

The main conclusion here arrived at, and now held by many naturalists who are well competent to form a sound judgment, is that man is descended from some less highly organized form. The grounds upon which this conclusion rests will never be shaken, for the close similarity between man and the lower animals in embryonic development, as well as in innumerable points of structure and constitution, both of high and of the most trifling importance, - the rudiments which he retains, and the abnormal reversions to which he is occasionally liable, - are facts which cannot be disputed. They have long been known, but until recently they told us nothing with respect to the origin of man. Now when viewed by the light of our knowledge of the whole organic world, their meaning is unmistakable. (629)

By such close examinations and observations of similarities in the womb stage of humans and animals, Darwin concluded that humans had also undergone stages associated with the low organ animals. His evolutionary statement here about humans was directly associated with the evolution of fauna and flora described in *The Origin*. Accordingly, his overall statement was regarded as offensive by conservatives and doctrinal religious figures who believed that it was God who created humans. The main issues in Darwin's works resulted from human's intellectual curiosity about natural principles and laws immanent in nature and science, and from man's

investigation about the origin of species, and, by implication, the origin of life.

### **Scientific Oriented Investigation of Science Fiction**

I have detailed Darwin's work and the widespread reaction to it because my dissertation focuses on its impact not only on reactions by his contemporaries and the cultural and literary production in his own lifetime, but on notions of ecological and bioethical consciousness in our own time. Although Levine has pointed out that "what Darwin actually said might be largely irrelevant to "Darwinism" elements in a novel by a writer who did not follow in great detail the Darwinian arguments and controversies" (10), it is my contention that writers and intellectuals not only read *The Origin of the Species*, but consequently projected such r/evolutionary ideas into their literary works. I will prove this contention by analyzing selected Victorian novels and novellas according to different types of scientific discourses for the purpose of exploring the nature and culture of science, and its bioethical implications within Victorian fiction.

It is well acknowledged that Gillian Beer's *Darwin's Plot* (1983) and George Levine's *Darwin and the Novelists* (1988) have explored Darwin's influence on the Victorian novels. Nevertheless, as Jonathan Smith reveals in his "Darwin and the Evolution of Victorian Studies," quoting Levine, "*Darwin's Plots* and *Darwin and the Novelists* have inspired surprisingly little in the way of major investigations of Darwin by literary scholars. Literary critics have talked about Darwin even more, but their attention has generally come in the form of article-length studies taking up some piece of Darwin's work or ideas." And finally he came to the conclusion as follows:

This is, I think, partly a reflection of the sense that where Darwin and

Victorian literature is concerned, Beer and Levine have basically said all the important things worth saying. They have become the obligatory, obeisance-paying opening reference in introductory paragraphs of works that map an unconsidered niche or a modest extension of critical terrain. (216-17)

Beer and Levine must be given the credit they deserve. They have helped literary scholars analyze the social and cultural relations between Darwinism and society from a cultural perspective. For example, they employ ‘natural selection’ to explain the marriage problems between different classes and statuses which can be found in Victorian novels. Another example is seeing the Darwinism in Pip in Charles Dickens’ *Great Expectations* in terms of how he grows up to be a gentleman from the low classes. In these kinds of analyses, however, the focus is more on the socio-political aspects of the class movement than on the scientific aspects of the natural phenomenon. In this kind of analytical process, Darwin’s scientific insight is ignored or overlooked by literary scholars. Smith even suggests a reason: “Literary scholars’ reticence in engaging more fully with Darwin is also surely, as Levine suggests, the product of discomfort with a figure often seen as proving a scientific basis for a variety of deplorable Victorian and modern sins” (217).

For that purpose, all the novels that many scholars such as Beer and Levine discuss are not seemingly related with science itself even though they are selected to explain the interrelationship between Darwin evolutionary theory and social human life:

Employing *Middlemarch*, *Daniel Deronda*, and Hardy’s novels in Gillian

Beer's *Darwin's Plot*, Gillian Beer makes it clear that she is going to "explore some of the ways in which evolutionary theory has been assimilated and resisted by novelists who, within the subtle enregisterment of narrative, have assayed its powers." She thinks that Darwin's *The Origin of Species* "is concerned with Victorian novelists living, in relation to evolutionary theory, in the phase when 'a fact is not quite scientific fact at all' and when 'the remnant of the mythical' is at its most manifest"(4).

Influenced by Beer, Levine is also "concerned with Darwinian theory as a historically locatable response to questions of particular urgency among the Victorians: questions about the sources of authority (religious, political, and epistemological), about the relations of the personal and the social to the natural, about origins, about progress, about endings, about biological and social organisms." And he continues to say that "my focus will be on how Darwin's real or reputed response to these questions interacted with the responses and forms of nineteenth-century English narrative" (2). In other words, he mainly focuses on the socio-political relations between human and society in structured social and cultural environments represented in *Mansfield Park*, *Little Dorritt*, Anthony Trollope's works, and in Scott and Conrad's novels.

In scholarly analysis since Beer and Levine's study of literary approaches to Darwin, the theory has been not only applied to analysis of many different genres of literature, but has also influenced literary and social theory and criticism. Joseph Carroll attempts to integrate a large scope of disciplines in *Literary Darwinism: Evolution, Human Nature, and Literature* (2004). He summarizes what he elaborates in his book, which are "(1) discussions about the relations among different schools or theoretical perspectives; (2) essays in Darwinian literary theory and practical criticism;

and (3) scholarship on Darwin”(xxiii). Eventually, his research supports Edward Wilson’s concept of consilience, which means interdisciplinary and ecological confluence between literary and cultural disciplines and natural sciences. In particular, he elucidates by briefly quoting D. H. Lawrence, Thomas Hardy, George Eliot, and H. G. Wells, that literature is a result of human’s ecological and evolutionary interrelationship with nature or environment as it is a sort of human psychic response to the natural landscape.

Beer’s, Levine’s, and Carroll’s works have been committed to the development and expansion of use of Darwin’s theory in various ways in that their analysis of the representative Victorian novels laid a solid foundation for other scholars’ analysis of other Victorian novels that I have mentioned, and modern or postmodern novels that seem far removed from Darwinian theory. Nevertheless, as a whole, they tend to exclude fiction in which concrete scientific concepts of evolution could be found and applied in order to allow for a more complete analysis of applying Darwinian theory to the Victorian fiction. That is why there has been little research that specifically explores the concepts of scientific evolution in Victorian texts. Therefore, by examining a larger representation of key Victorian works, specifically Shelley’s *Frankenstein*,<sup>2</sup> Stevenson’s *Dr Jekyll and Mr Hyde*, Wells’ *The Island of Dr Moreau*

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<sup>2</sup> Although the work was published in 1818, there would be no problem with putting Mary Shelley’s *Frankenstein* in the category of Victorian science fiction because the work, “[t]he novel most frequently claimed as the first work of modern science fiction” (Brantlinger 370, 2002), is intricately interrelated with the subsequent science fiction and writers in the mid and



and his other short stories, Oscar Wilde's *The Picture of Dorian Gray* and Conan Doyle's *A Study in Scarlet*, I intend to show how evolution theory impacted these writers, how the evolutionary notion of hybridity are revealed in the novels, which in turn generated an unease with the concept of hybridity as well as an anxiety about the ecological and bioethical roles of the sciences and scientists.

Earlier in the introduction, I mentioned the influence of the geologist Charles Lyell on Darwin's evolution theory. The second chapter will examine this influence and also review how one key concept, natural selection, of Darwin's evolutionary theory is represented in Victorian fiction, and what imprints the theory left on the Victorian body within the fiction. This discourse envisaged human beings and animals according to a Darwinian scale of being, in which humans could descend to the ape-like creature in *Dr Jekyll and Mr Hyde* while animals could evolve into the kind of human beings described in *The Island of Dr Moreau*. The mobility of the scale though created unease through its challenge to traditional metaphysical hierarchies and the implied de-centering of an anthropocentric model. Therefore, I shall look into how this theory and the consequent unease implicitly or explicitly influenced the works of Victorian writers and how the theory caused another site of unease, the clash between theologian naturalists and conservatives who would protect the Victorian tradition, culture and religion, and modern scientists who gave discomfort to those belonging to the Victorian

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late nineteenth century. The other reason why I am willing to use 'Victorian' rather than 'the nineteenth century' is that the characteristics of Victorian culture and society will be generally addressed and focused on in this dissertation.

conventions through their articulation of unfamiliar scientific inventions and theories. The degeneration theory also could be applied to the idea that those human beings would be likely to be degenerated because of the development of science and the change of environment.

If there was unease concerning ascent and descent, there was also disquiet about other ideas about species indistinction, specifically the existence of the hybrid. The third chapter will consider the hybrid creatures and monsters – hybrids of human and animal, and inanimate things that are animated by science's interference with them. Today, we live in a world consisting of what Garcia Canclini calls 'Hybrid Cultures' and what Peter Burke calls 'Cultural Hybridity.' In his book of that name, Burke predicts that the extending of cultural change based on heterogeneity will be inevitable while the national culture based on national identity will lose its strength. As a consequence, this trend will intensify what he defines as a positive meaning of hybridity. He clarifies the concept and role of hybridity as follows:

The concept of hybridity has also been criticized . . . for ignoring cultural and social discrimination. It is obvious enough that prolonged encounters between human groups have included a good deal of conflict. However, it may be useful to distinguish these social conflicts from their unintended consequences over the long term – the mixture, interpenetration or hybridization of cultures. (7)

In the *Hybrid Cultures*, Canclini argues that hybridization is an inevitable, natural, socio-cultural process. He defines hybridization as follows:

I will start with a first definition: I understand for hybridization socio-cultural processes in which discrete structures or practices, previously existing in separate form, are combined to generate new structures, objects, and practices. In turn, it bears noting that the so-called discrete structures were a result of prior hybridizations and therefore cannot be considered pure points of origin. (xxv)

For both Burke and Canclini, hybrid cultures and cultural hybridity signify the natural phenomena which are interlinked to contemporary or modern cultures. In essence, it can be said that hybridity has become one of the most distinguishing features of modern culture.

However, this is a significantly different understanding and acceptance of hybridity from the scientific interpretation in the Victorian era. The sense of unease about such hybridization then, about which Darwin expressed his concern in *The Origin of Species*, is best represented by a rebellious monster, Frankenstein's monster, who serves as the hybrid of science and nature. Such a creature created a sense among Victorians that society had become impure and had deteriorated. On the other hand, Frankenstein's monster also represents the other unique aspect of hybridity – the sense of sublimity that the monster holds in terms of Edmund Burke's theory of the sublime.

Such hybridity would not have been possible without the scientists and their scientific experiments. The fourth chapter will explore the scientists' passion and ambition and the conflicts between new sciences and traditional culture. The anomalies that the scientists created contributed to the paradigm shift in the understanding of

science that would be later articulated by Thomas Kuhn. Such scientific developments were made in laboratories, populated by mad but ambitious scientists such as Frankenstein, Dr. Jekyll and Dr. Moreau who were perceived as perverting the social order. That is why scientists who represented this epistemological tension and distort were often represented as “mad” because of their anomalous, eccentric, and weird experimentation, particularly, vivisection and dissection with animal and human bodies. From a critical perspective, Roslynn D. Haynes, in her book, *From Faust To Strangelove* (1994), provides an insightful analysis of various types of scientists in Western literature. While it is very helpful to my study of mad scientists, it lacks my focus on how the mad scientists’ experimentations in the dreary lab influenced the social and cultural aspects of the times. In addition, Millhauser’s review of scientists in Victorian fiction, “Dr. Newton and Mr. Hyde, Scientists in Fiction from Swift to Stevenson,” and Stiles’s and Schummer’s analysis of the ‘mad scientist’ in “Literature in Mind: H. G. Wells and the Evolution of the Mad Scientist” and "Historical Roots of the "Mad Scientist": Chemists in Nineteenth-century Literature" will help me describe the concept of ‘mad scientists’ in the Victorian period while the importance and role of the lab in nineteenth century science will be reviewed by taking a close look at historical contexts of government’s assistance to scientists’ works and laboratories. While these studies analyze different types of mad scientists within western literature and the Victorian era, they do not look into a correlation between the mad scientists' experiments and their laboratories. Therefore this section will investigate the laboratories and the mad scientists who occupy them. In particular, I will analyze what Dr. Moreau's experiments conducted in the dark and gloomy laboratories achieve and

what they socially represent.

The more innovative concepts of science promoted by these scientists faced considerable dissent from groups of traditional elites who did not want the rapid change of the society, as well as conservative and religious commentators such as Matthew Arnold who worried about how the popular science might be favored over traditional academic disciplines like classical literature and arts. His concerns produced the important debate between himself and T. H. Huxley who fervently supported the science. Huxley was strongly opposed to the opinions of Arnold who equated popular science with lowly manual skills and naïve mundane knowledge.

In a return to the sense of unease surrounding the role of science, chapter five will argue that despite their unimaginably significant scientific achievements, the regrets and laments expressed by the scientists and narrators in Victorian texts implied that scientists lacked an ecological and bioethical consciousness, as if they could not see what the experimented body was offering in the way of a cultural commentary about society's attitudes towards human and animal experimentation. It seemed they had no recognition of what George Lakoff explains in *Philosophy in the Flesh*, when he says that “the mind is not separate from or independent of the body” (555). As Lakoff suggests, the subtle changes that we achieve in modern society are culturally and metaphorically embedded in our bodies. So, in the Victorian era, the hybrid forms that arose from mixing machine and animals bio-technically caused a hybrid identity to be created. This kind of hybridity, mirrored in bodily changes, produced significant philosophical shifts in how we understand identity. It was different from Descartes' traditional sense of ego which focuses only on rationality, because now the sense of

self was formed in relation to other human bodies and other environmental factors that had become an integral part of the self. The scientific revolution concerning the uneasy creation of the hybrid human body in these labs did not produce at the time a sense of bioethical consequences of the kind that I will discuss by utilizing the work of Gilles Deleuze, Maurice Merleau-Ponty and Peter Singer, whose ecological and bioethical discourses will suggest the desirable guidelines required in scientific and medical arenas.

The four areas of enquiry will take place within the larger context of a discussion of consilience, which is a means by which inter-textual and interdisciplinary solutions are offered as successful alternatives to insoluble binary problems despite their disciplinary paradigms that are seemingly incompatible with each other. In that sense, distinctive consilient concepts in Edward Wilson's *Consilience* offers tangible and appropriate methods to integrate separate ideas in seemingly unrelated fields such as the humanities and science in order to create productive solutions. This exploration will take place within a larger conceptual frame that is concerned with the issue of consilience as it has impacted the recent crisis of humanity studies, caused by the assumed superiority of science and technology. Of course, humanity studies and culture should not be trivialized, but, in order to achieve this, we need to develop a genuine capability of thinking of the two cultures in consilient terms because of the need to end the ever-present conflict between the two cultures that originated in the Victorian era with the debates between Arnold and Huxley. It is only once we have witnessed this tension in Victorian literature that we can gain the foresight necessary to anticipate and prevent the future problems that our

science and technology-driven society will face. Otherwise science and technology will bring wealth and happiness to the detriment of human dignity and value.

## CHAPTER 2

### SCIENTIFIC REVOLUTION, EVOLUTION, AND DEVOLUTION

#### IN THE VICTORIAN ERA

As Darwin's revolutionary ideas were very much influenced by Charles Lyell, the first section of this chapter will discuss the Darwinian ideas of the theory of life's origins and Lyell's concept of geological evolution as they apply to the story of *Frankenstein* and the *Time Machine*. Second, the section entitled "Darwin's Natural Selection Implied in Science Fiction" will show how the evolutionary concepts of natural selection are mirrored in the events of the stories, in which novelists discuss how organisms will evolve or transform to survive. As diverse applications of evolutionary ideas to human body are made by biological, medical, physiological, or aesthetical ways in many novels, the third section "Evolution Imprinted on the Victorian Body" will investigate how evolutionary ideas are represented in weird experiments. Finally, the section "Evolutionary Consequences: Evolution vs. Degeneration" will review how 'evolution' came to look increasingly like a process of devolution or degeneration instead.

#### **Darwin and Evolutionary Framework in Science Fiction**

Scientific exploration into the origin of life and the evolutionary process was implemented into literature in various ways. *Frankenstein* is one of the key examples. Mary Shelley was most consciously aware of the influence of Erasmus Darwin, saying "The event on which this fiction is founded has been supposed, by Dr. Darwin, and some of the physiological writers of Germany, as not of impossible occurrence" (Shelley 3). But this influence cut both ways. At a certain point, before the publication



of *The Origin of the Species* in 1859, Charles Darwin had most likely read Mary Shelley's *Frankenstein* which was published in 1818. As Baker put it "The work has had a profound effect on the perception of science and scientists" (Baker 140). Darwin did read voraciously. In the *Life and Letter of Charles Darwin* (1887), Darwin states that "Up to the age of thirty, or beyond it, poetry of many kinds, such as the works of Milton, Gray, Byron, Wordsworth, Coleridge, and Shelley, gave me great pleasure" (100). It is not unreasonable to assume that Darwin's taste and interest in literature might have led him to read *Frankenstein*. In so far as Mary Shelley attempted to embody the principle of life in *Frankenstein* and in so far as Darwin tried to trace the origin of species through a long research journey, they did not have widely divergent perspectives on the concept of evolution.

It is possible to take the connection further. The year 1818, when Mary Shelley published *Frankenstein*, was the time when scientists were conducting many experiments based on the Galvanian theory that claimed the origin of life was related to electricity. Therefore, the novel *Frankenstein* should not be considered just as a gothic novel. Shelley, who was particularly interested in the natural sciences, mentions the "everyday development of scientific technology" (35) in *Frankenstein*. She would have been alluding to the works of the French chemist and biologist Antoine Laurent Lavoisier (1743-1794), the Italian Physicist Luigi Galvani (1737-1798) who conceptualized the galvanian theory, the American scientist and inventor Benjamin Franklin (1706-1790), the chemist and physicist John Dalton (1731-1802), the Italian physicist Alessandro Volta (1745-1827) who invented batteries, the natural scientist

and physiologist Erasmus Darwin, and the cleric and biologist Gregor Johann Mendel (1822-1884) who discovered the genetic rule of peas.

It is interesting that similarities can be found between the lives of fictional Frankenstein and young Darwin. In Darwin's *The Life and Letter of Charles Darwin*, Darwin describes how he was hard at work conducting chemistry experiments, aiding his brother: "I read with great care several books on chemistry. . . . The subject interested me greatly, and we often used to go on working till rather late at night. . . . The fact that we worked at chemistry somehow got known at school. . . . I was also once publicly rebuked by the head-master" (35). The headmaster's negative attitude towards science in the educational field is reminiscent of the discouragement that young Frankenstein received, first from his father and then one of his teachers. His father tells him, "My dear Victor, do not waste your time upon this; it is sad trash" (23), while Krempe, one of Ingolstadt's University professors asks him, "Have you. . . really spent your time in studying such nonsense?" (29) Despite the disparity of the situations to which they were exposed, it seems apparent that Darwin and Frankenstein, even if a fictional character, had a lot in common in terms of their scientific curiosity and interest. In other words, it is possible to see Frankenstein's creation of a human as a literary re-working of Darwin's scientific investigation into the origin of humankind, and as Frankenstein "deemed it criminal to throw away in useless grief those talents that might be useful to my fellow-creatures" (179), so Darwin desired to complete his dozens of years of studies with his publication of *the Origin of Species* and *the Descent of Man*. In this sense, both Darwin and Shelley produced revolutionary evolutionary work that fundamentally challenged theories

about creation.

The cross-pollination of ideas in different disciplines was commonplace. H. G. Wells for example revealed Darwin's powerful influence in his novellas, addressing directly Darwin's theoretical term, 'natural selection.'<sup>3</sup> Alan Lightman demonstrates the relation between Wells and Darwin in his introduction to *Dr. Moreau*:

As Wells, like many other intellectuals, reached to the new scientific ideas around, Charles Darwin was a major influence. At the publication of *Dr. Moreau*, in 1896, *Darwin's On the Origin of Species* was still very controversial. The human qualities in animals or the animal qualities in humans had been considered metaphorically throughout the ages. But once one accepts the Darwinian notion that *Homo sapiens* has evolved from other creatures, humankind can be compared to other beasts with far more intimacy and force. Such comparisons are no longer merely metaphors. Simply put, we are animals. (Lightman ix)

Using his scientific and literary imagination in his first novella the *Time Machine*, for example, Wells portrays the comprehensive aspect of evolution of human and society from a Darwinian perspective. Imagining that Darwin could trace the process of evolution in his scientific journey to unknown space, the Time Traveler can

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<sup>3</sup> Wells met Huxley while a student at Normal School of Science in South Kensington where Huxley taught him biology and where he converted from being a sincere Christian to becoming a Darwinian atheist who had interest in Darwin and eugenics. Jerry Bergman. "H. G. Wells: Darwin's Discipline and Eugenicist Extraordinaire" (2004 Dec. 1).

observe the possible-probable evolution by riding his time machine from the present world to the far future one. The world of the year 802,071 to which the traveler pays a visit is divided into the upper world and the underground world, and such a division, we may guess, was geologically designed by the writer based on the geological concepts of Charles Lyell. It is certain that Lyell had a strong influence on Darwin who confesses in the first chapter of his biography: "I had brought with me the first volume of Lyell's *Principles of Geology*,' which I studied attentively; and the book was of the highest service to me in many ways" (*Life* 76).

In the first part of his ground-breaking book, Lyell emphasizes the geological movement of the surface of the earth:

Geology is the science which investigates the successive changes that have taken place in the organic and inorganic kingdoms of nature; it inquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of our planet. . . . The form of a coast, the configuration of the interior of a country, the existence and extent of lakes, valleys, and mountains, can often be traced to the former prevalence of earthquakes and volcanoes in regions which have long been undisturbed. To these remote convulsions the present fertility of some districts, the sterile character of others, the elevation of land above the sea, the climate, and various peculiarities, may be distinctly referred. On the other hand, many distinguishing features of the surface may often be ascribed to the

operation, at a remote era, of slow and tranquil causes—to the gradual deposition of sediment in a lake or in the ocean, or to the prolific increase of testacea and corals. (1- 2)

After reading this book explaining the mysterious origin of landscape formations and structures, Darwin came to think “that the earth was exceedingly old and that processes we can observe now were the same as those acting in the past – a position known as uniformitarianism... This work was to provide the timeframe he needed to accommodate his theory of evolution by slow, gradual changes” (174).

The spaces of upper world and underworld in Wells’ story are imbued with the concept of time, reflecting the extent of the historicity of immense ages implicated with Lyell’s sense of geological structure. As noticed in the changes in the natural and environmental landscape, the future world in the *Time Machine* can be also regarded only as a small temporal and spatial point in the whole process of evolution. The Morlocks live in the underground world while the Eloi reside on the upper world. Wells’ idea that humans will have evolved into the Morlocks and the Eloi naturally echoes Darwin’s concept of natural selection. Under the harsh milieu of labor in the dark underworld, the Morlocks have “kept keen on the grindstone of pain and necessity” (36) to survive and changed into human creatures of cruelty and violence. On the contrary, the Eloi have turned into small and weak creatures as they have led a comfortable life in the light and shiny world, away free from “that hateful grindstone” (36).

Here was the new view. Plainly, this second species of Man was subterranean. There were three circumstances in particular which made

me think that its rare emergence above ground was the outcome of a long-continued underground habit. In the first place, there was the bleached look common in most animals that live largely in the dark—the white fish of the Kentucky caves, for instance. Then, those large eyes, with that capacity for reflecting light, are common features of nocturnal things— witness the owl and the cat. And last of all, that evident confusion in the sunshine, that hasty yet fumbling awkward flight towards dark shadow, and that peculiar carriage of the head while in the light—all reinforced the theory of an extreme sensitiveness of the retina. (50)

The Time Traveler realizes here that the Morlocks have evolved from laborers into “white, apelike creature[s]” (47) and only exist as the ‘second species of Man’ living in the artificial subterranean place. He also encounters human-like creatures called the Eloi, a harmless, pacifist, vegetarian race of diminutive beings, who came to be considered as the Morlocks’ prey. Suggested by the concept of ‘natural selection,’ which can be replaced by Spencer’s term ‘Survival of the Fittest,’ the living creatures should be the most adapted – the fittest - to survive even in the fictional environment. In other words, any kinds of living organisms are destined to undergo evolution to survive in their environment through this kind of natural selection.

Rather than creating a fictional event simply based on evolutionary clues that have been found around him, Wells worries what will happen to the human society in the future if evolution continues at its current pace. His creative work involved his

interest and concern about the epistemological and ontological change that the theory would bring to the present and future world. Wells' understanding of evolution is clearly expressed not only in his portrayals of the two differently evolved figures, but in his mention about huge infrastructural changes in Victorian London, which enabled him to envision the evolution of a future world. The writer seems to think that the first cause of the evolution lies in industrialization. Since the Industrial Revolution, many underground mines have been already developed in many places, and in 1863 the first underground railroad began to run in London. Since then, the networks of tubes were extensively expanded. Wells imagined that the continuous development of the underground into the rural and urban areas around London would ultimately alienate the laborers in the underground from the capital-owners above ground. In the long run, due to the process of alienation and natural selection, their life styles would become independent, the survival surroundings would differ, and the two classes of people would evolve in different physical forms. Wells concretely expressed this phenomenon in *The Time Machine*:

Beneath my feet, then, the earth must be tunneled enormously, and these tunnellings were the habitat of the new race. . . . What so natural, then, as to assume that it was in this artificial Underworld that such work as was necessary to the comfort of the daylight race was done? The notion was so plausible that I at once accepted it, and went on to assume the how of this splitting of the human species. . . . There is a tendency to utilize underground space for the less ornamental purposes

of civilisation; there is the Metropolitan Railway in London, for instance, there are new electric railways, there are subways, there are underground workrooms and restaurants, and they increase and multiply. . . . Even now, does not an East-end worker live in such artificial conditions as practically to be cut off from the natural surface of the earth? (50-51)

In the tangible world of the London underground, Wells had found his Morlocks and Elios.

Although the two worlds in *The Time Machine* are not a direct result of the earthquakes and volcanoes, Wells created the contrasting worlds by his ingenious and effective linking of Lyell's concept of old geological formation and Darwin's concept of evolution. Lyell comments on the relation between the ages and the species in his *Principles of Geology*: "We cannot doubt that the accumulation of so vast a succession of beds required an immense lapse of ages, and we are prepared to find some difference in the species characterizing the different members of the series; nevertheless, all may belong to different subdivisions of the Miocene period<sup>4</sup>" (214).

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<sup>4</sup> The Miocene is the fourth epoch (25-13 million years ago) of the Cenozoic period (Cenozoic, 66 – 2million years ago) in which the modern form of earth geological surface was almost completed. The epoch came after the Paleocene, Eocene, and Oligocene epochs and was followed by the Pliocene Epoch. In the Cenozoic period, modern ecology system was formed as a whole, and mammals, birds, snakes, and seeds appeared. Mammals developed rapidly and inhabited many various environments. Unlike animals on the earth, of all the sea



Wells' comment on "the gradual widening of the present merely temporary and social difference between the Capitalist and the Labourer" (50-51) seemed to offer analogies to Lyell's description. The two races were originally derived from the same race of the human species, but they have had to undergo the process of natural selection in different 'beds' of environments - living conditions - for more than 800,000 years. Although, as a result, the species has diverged into the subdivision of the two races, the two races still belong to the same species that can be called humans. In that context, Lyell's geological and Darwin's evolutionary concepts are converged into Wells' fictional characterization in *The Time Machine*.

### **Darwin's Natural Selection Implied in Science Fiction**

An interpretation of *The Time Machine* using Lyell's and Darwin's evolutionary concepts is an effective means of explicating the long and hard process of struggle and variation between the two races. This view can be verified by Baker's statement on *The Time Machine*, "That the Traveler ends up in the year 802,701 also indicates the vast passages of time required by Lyell's uniformitarian geology and Darwin's theory of "natural selection" (203). The setting of the two worlds foregrounds natural selection. The physical and physiological variations of organisms must have been necessary in order to survive in the harsh struggle against enemies and

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plants and animal, only whales underwent a fundamental change. In particular, during the Miocene epoch, the Himalayan mountains elevated, modern fauna and flora appeared, and the primates firstly thrived. See *McGraw-Hill Encyclopedia of the Geological Sciences* (1978) and *Encyclopedia of Earth and Space Science I* (2010).

to be the fittest in nature. In that aspect, it is through his scientific literary narrative that the traveler would enlighten for his contemporaries how human figures could have evolved into the future races, the Morlocks and the Elios. The fact that Wells uses the term 'natural selection' twice in *The War of the Worlds* indicates how Darwinism influenced the design of the work. In the first instance of its usage, Wells argues that the Martian invasion would fail because they had failed to adapt to earth's alien environment. In contrast, humans had more successfully evolved into a germ fighting structure:

It is worthy of remark that a certain speculative writer of quasi-scientific repute, writing long before the Martian invasion, did forecast for man a final structure not unlike the actual Martian condition. . . . He pointed out . . . that such organs as hair, external nose, teeth, ears, and chin were no longer essential parts of the human being, and that the tendency of natural selection would lie in the direction of their steady diminution through the coming ages. (127)

Although this natural selection ensured that humans would physically resemble the Martins, Wells suggested that humans had also developed the power of resistance:

We did not succumb to germs without a struggle, and to many [germs] - those that cause putrefaction in dead matter, for instance - our living frames were altogether immune. In contrast, as there are no bacteria on Mars, directly these invaders arrived, and directly they drank and fed, our microscopic allies began to work their overthrow. (168)

The germs happen to function as powerful aides to fight back against the Martians just when the humans seem powerless and helpless.

The second occurrence however predicts that the physical appearance of the Martians anticipated a similarly negative outcome for mankind. The concern that humans would evolve into Martian-like creatures in the future according to the principle of natural selection signifies Wells' thought that the human body would evolve into imaginary Martians with Octopus-like head not only because humans would use only their brain without moving their bodies, but also because machines would become paramount as the development of science and technology proceeded. In 1893, Wells contributed an article entitled "The Man of the Year Million" to *Pall Mall Budget*, a weekly magazine, in which he predicted humans would use mostly only their brains in one million years time. The organs will be diminished and degenerated while the heads will become bigger like the octopus heads of the Martians. In addition to that, they would take nutrition through all body surfaces, not simply by their mouths, hence their need for nutrition baths. In the same year, a caricature entitled "1,000,000 A. D." (1893 Nov. 25) by Gordon Haight was featured in *Punch* magazine in which humans with Octopus-like heads and bodies took these nutrition baths that Wells described.

The Martians' external figures in *The Time Machine* were envisioning the future of the human body, which meant that the weird appearances of the extraterrestrial aliens were projections of the longevity of humans' evolution caused by natural selection. What should be pointed out here is that the concepts of 'chance' and 'random' were essential components of the process of variation as a stage of natural selection. As Levine

maintains, Wells, like Darwin, believed that the evolution of the body was not executed in accordance with religious and cultural prescriptions but through chance or randomness:

Darwin's laws, then, were based on what would have seemed a very strange combination of the random and the orderly. . . . But the random had no place in Victorian philosophy or science. And Darwin seemed to risk turning the world into an accident, as he turned his ignorance of the conditions of variation into a condition of the world he observed. It was an imaginative leap that survived Victorian mechanistic explanation, so favored by his own most fervent supporter, Huxley. (93-94)

He further argues that during the Victorian period, “Value would now be seen to inhere not in permanence, but in change, not in mechanical design but in flexibility and randomness. Natural selection introduced the possibility of incorporating the random into scientific explanation” (94).

Robert L. Stevenson’s *Dr. Jekyll and Mr. Hyde* would be a good case of exemplifying this discourse on the evolution of the body and its transformation in terms of chance and randomness. Dr. Jekyll can quickly evolve into the ugly Mr. Hyde by taking the self-prescribed transcendental medicine. However, he is doomed to remain as Hyde permanently due to the side-effect of its overdose and to its shortage. Although he tries every way possible to remake the same medicine, unexpectedly he fails even with the same materials he used before. Dr. Jekyll’s butler, Poole, possesses a note that hints as to what happened to him:

Have you any of these papers?" asked Mr. Utterson. Poole felt in his pocket and handed out a crumpled note, which the lawyer, bending nearer to the candle, carefully examined. Its contents ran thus: Dr. Jekyll presents his compliments to Messrs. Maw. He assures them that their last sample is impure and quite useless for his present purpose. In the year 18—, Dr. J. purchased a somewhat large quantity from Messrs. M. He now begs them to search with the most sedulous care, and should any of the same quality be left, to forward it to him at once. Expense is no consideration. (40)

With the note, it can be figured out why he cannot come back as Dr. Jekyll. Because of the difference in the salt purity, he cannot make the same medicine with the same sources. Eventually, it turns out that it is by random chance rather than by the successful implementation of his plan that Mr. Jekyll made the mysterious medicine in the first place. Later on, the reason becomes clear when Dr. Jekyll confesses his failure to remake the medicine. Wretched, he leaves his statement about the medicine as follows:

[M]y punishment might have gone on for years, but for the last calamity which has now fallen, and which has finally severed me from my own face and nature. My provision of the salt, which had never been renewed since the date of the first experiment, began to run low. I sent out for a fresh supply, and mixed the draught; the ebullition followed, and the first change of colour, not the second; I drank it, and it was without efficiency. You will learn from Poole how I have had London

ransacked; it was in vain; and I am now persuaded that my first supply was impure, and that it was that unknown impurity which lent efficacy to the draught. (54)

Dr. Jekyll couldn't acquire exactly the same quality of medicine material again. Without the same quality and purity of medicine, he could not come back as Jekyll. This all happens by accident. Dr. Jekyll is no more himself, but Mr. Hyde. That means, he is mutated into "that masked thing like a monkey" (42) by the side-effect of the medicine. In other words, he has undergone an accidental transformation or, in Darwinian terms, an evolution: he has been exposed, and newly adapted, to new environments and the new sciences of the new age. Moreover, it should be pointed out that there is no compensation in accepting the accidental hypothesis since the story divulges the possibility of a degeneration or devolution of human being and society as opposed to evolution or development of human race and society. At last, as an "ape-like" (42) monster, Hyde arrives at the situation where he can no longer return as Dr. Jekyll. This random event that probably takes place by chance resembles what happens at the process of natural selection. According to the statement at Poole's hand, it is revealed that the impurity in the last material makes Hyde fail to make the same quality of medicine as the first-made transcendental medicine. In other words, the prescription event in *Dr. Jekyll and Mr. Hyde* shows the situation of random chance that can take place at the course of natural selection in the nature.

In the conclusion of *The Origin of Species*, Darwin finalizes his thoughts on evolution theory by expounding the scene of the "tangled bank" (528). Darwin considers that the axial principle governing a variety of living organs flourishing on a

river bank is not “the laws impressed on matter by the Creator” (527), but “the fixed law of gravity” (529). In fact, the natural selection in Darwin theory is based upon careful observations rather than a theory proved by scientific experimentation. As Levin puts, accordingly, “although we now know the mechanisms of variation, they remain inexplicable in the sense of [the] unpredictable and random” (Levine 93-94). And the reason why Darwin’s suggestion of natural selection is important is because he would suggest a new scientific paradigm by emphasizing the universal pivotal axis at the center of Isaac Newton’s law of gravity rather than religion.

### **Evolution Imprinted on the Victorian Body**

Darwin’s revolutionary theory redefined human beings as a sort of animal, thereby resulting in a new epistemological and ontological awareness in Victorian society. Most Victorian writers were literally engaged in the discourse of Darwin’s theory by writing novels in which events and characters played out the concepts of ‘natural selection,’ ‘survival of the fittest’ and ‘evolution.’ In some Victorian novels, scientists and doctors indicated the consequences of this Darwinian world by experimenting with human bodies: young Frankenstein creates a human monster, a misfit in the social and cultural environment of human society; a well-mannered and intellectual Dr. Jekyll degenerates into an apelike evil Hyde, a symbol of animal instinct; and Dr. Moreau attempts physiological experiments to evolve animals into human beings. As all these creatures are ‘artificially’ selected by scientists, so they fail to fit into their new social environments. Similar Darwinian resonances occur in other non-scientific settings. The personal characteristics of Dorian Gray for example are

designed with Darwinian ideas. Gray, who is described as having been influenced by the German Darwinian movement, deteriorates himself into an ugly old creature at the end of the novel.

Darwin's evolution theory not only changed the ontological and epistemological concepts of people, but it also created a premise by which science and technology of the period could be improved. As George Levine has said, "for Darwin, scientific attitude does not merely rationalize the world, explain it away, but opens it up and makes its wonders available"(26). As the technology of science and medicine developed quickly, people believed that lab researchers, scientists and medical doctors could alter the physical body through vivisection and medical methods. Towards the end of nineteenth century, many novels that reflected this developmental scientific thought were published.

Therefore, it is important to examine the way in which Darwinian evolutionary concepts were imprinted onto the body and the mind in fiction form. The transformation that occurred will be illustrated in the following three novels which were published in the period of ten years between 1886 and 1896: *Dr. Jekyll and Mr. Hyde* (1886) by Robert Louis Stevenson, *The Picture of Dorian Gray* (1891) by Oscar Wilde and *The Island of Dr. Moreau* (1896) by H. G. Wells.

Experiments using the human and animal body had been in practice from the end of eighteenth century to the beginning of nineteenth century in Europe even before *the Origin of Species* was published. For example, an Italian scientist, Luigi Galvani, found in 1791 that a dead frog was moved when it was electrically shocked. Nine years later, he attempted to give electric stimulation to a human cadaver (Morris 95-



98). The spread of evolution theory eventually made people change the idea as to how the body of animals and humans were conceived and used. As the theory denies the conventional idea that man was created by God, it led people to believe that man had been one of the highest organic creatures who had evolved from the lowest organic thing. This changed idea of human origin enabled scientists to consider the human as a potential subject for vivisection, one which could be observed and analyzed in the laboratory.

For example, in *Dr. Jekyll and Mr. Hyde*, as a doctor and scientist Jekyll believes that a human's dual nature of evil and good can be perfectly divided through development of 'transcendental medicine.' He develops the medicine and takes it to prove his theory to Dr. Lanyon and other scientists who "have denied the virtue of transcendental medicine," and who "have derided [their] superiors" (53). As a result, his body is transformed into Edward Hyde, and is considered to be Jekyll's alter-ego. The description of his figure is as follows:

Edward Hyde was so much smaller, slighter and younger than Henry Jekyll. Even as good shone upon the countenance of the one, evil was written broadly and plainly on the face of the other. Evil besides (which I must still believe to be the lethal side of man) had left on that body an imprint of deformity and decay. (58)

In the description of Hyde, it is interesting to view the way in which the word 'imprint' is used, because the word has a negative implication for Hyde's body which is now imprinted with deformity and decay. According to the orthodoxy of

Christianity, the human body and mind should have remained absolutely immutable as in “our image, in our likeness” (Genesis 1:25), but the scientific theory suggested a more unstable mutability in a human’s form and image, which in the case of Hyde’s body is configured as a physical manifestation of evil. Hyde’s appearance spoke to the hideous part of human desire and instinct which was hidden beneath the more civilized exterior. After taking his own medicine, Jekyll, a gentle and good doctor, was transformed into the apelike young Hyde. He was small and fast. Mr. Utterson, Jekyll’s lawyer, who saw Hyde, described him as “pure evil” (58) and “something . . . not only hellish but inorganic” (69). Unfortunately, the scientific and medical research which Jekyll believed to be a success backfired and deformed his body. Through this accident, Hyde was created and his existence as Hyde only created fear and hatred.

Interestingly, the Victorian era was also interested in examining the antithesis of Hyde’s condition. Whereas Jekyll changes into apelike Hyde, in Wells’ *The Island of Dr. Moreau*, Moreau tries to transform various animals into human by dissecting physical body parts. Wells was influenced by Darwin who published *The Expression of Emotion in Man and Animals* in 1872. The book provided an opportunity to bring uncertainty even to the distinction between human and animal’s minds in a year that was full of “controversies, including vigorous objections to the application of natural selection to humans” (*Correspondence* xvii). Darwin thought that even animals could think and feel as humans did. The introduction to the third edition of the book indicates the radicalism of his thought:

*Expression* was criticized by many scientists because, in their view,

Darwin was guilty of the sin of anthropomorphism - ascribing to animals what we humans feel and think. He did not simply describe the expressions shown by other animals, he wrote about their emotions. For example, he said that monkeys experienced pleasure, grief, vexation, jealousy, and so on. (Ekman xxix)

The book deals with the mentality and psychology of animals as if they would think and feel like humans. As an application of Darwin's ideas, Dr. Moreau has the radical idea that he can modify the mentality of the animals on the island. If the attempt to deal with human psychology brought on actual bodily transformation in *Dr. Jekyll and Mr. Hyde*, the scientific experiments in *The Island of Doctor Moreau* are practiced with a strong conviction that the artificial transformation of the body can change the actual consciousness of animals. Moreau states:

It's not simply the outward form of an animal which I can change. The physiology, the chemical rhythm of the creature, may also be made to undergo an enduring modification, . . . it is a possible thing to transplant tissue from one part of an animal to another, or from one animal to another; to alter its chemical reactions and methods of growth; to modify the articulations of its limbs; and, indeed, to change it in its most intimate structure. (75)

His experiments are all designed with this theory in mind. His experiment is started with the expectation that animals can be transformed into humans through surgery and dissection because animals are the consequences of gradual evolution.

Moreau has set up a Law for those animals who do not have the ability to walk and speak like humans, a Law by which they are “Not to go on all-Fours,” “Not to suck up Drink,” “Not to eat Fish or Flesh,” “Not to claw the Bark of Trees,” and “Not to chase other Men” (61). The effort of Moreau to admit the animals into human society where Law and God co-exist looks like an experiment to artificially shorten the natural course of evolution. Darwin’s point in *The Descent of Man* that humans were believed to have “descended from some less highly organized form” (596) is reflected in Moreau’s experiments that held the premise that differently evolved entities could become homogeneous once more through medical and biological methods.

*The Island of Dr. Moreau* starts with the assumption that humans are born good whereas animals are innately evil. In the novel, it is accepted that a deformity in bodily transformation is meant to signify the acquisition of an evil animal nature. However, the fact that literature in this period shows a struggle between the good intentions of the human being and the corrupted soul of animal instinct vividly reveals the true nature of the human mind. The dual nature of human mind is shown more clearly in *The Picture of Dorian Gray*. Gray is a product of the British decadent culture of the late nineteenth century, which “represented a disorderly, jaded, self-indulgent passivity, immoral in its indifference to the future” (Haley 215). Gray readily accepts Lord Henry Wotton’s hedonistic art theory, pursues the life of hedonism, and disregards the reality of the world. However, Gray is ceaselessly haunted by his conscious awareness of the correlation between moral fault and physical decay. Gray realizes that “For every sin that he committed, a stain would fleck and wreck its fairness” (79). While holding a mirror, he looks at his face in the

portrait drawn by Basil Hallward, which is aging hideously. Afterward, he looks at the young beautiful face reflected on a well-polished glass mirror. Ironically, the apparent contrasting appearance stimulates his pleasure more. As a consequence, Gray “grew more and more enamoured of his own beauty, more and more interested in the corruption of his own soul” (109). The appearance in the portrait becomes more hideous according to the evil deeds done by Gray in reality.

On the contrary, the beauty of Gray in the mirror instigates him to pursue a more hedonistic life, and simultaneously pursue an experiment based on curiosity. Having “a feeling of almost scientific interest” when he gazes at the portrait, he asks an interesting question to himself about the scientific relation between his bodily chemical atoms and his soul:

As he often remembered afterwards, and always with no small wonder, he found himself at first gazing at the portrait with a feeling of almost scientific interest. That such a change should have taken place was incredible to him. And yet it was a fact. Was there some subtle affinity between the chemical atoms that shaped themselves into form and colour on the canvas and the soul that was within him? Could it be that what that soul thought, they realized?--that what it dreamed, they made true? Or was there some other, more terrible reason? He shuddered, and felt afraid, and, going back to the couch, lay there, gazing at the picture in sickened horror. (82)

Gray’s thought that the formation and color on canvas may have a chemical

reaction in his corrupted soul implies that soul and body may change, transform, and re-form according to any given condition or environment. Interestingly, the concept of affinity between soul and chemical atom originates from an evolution doctrine which he had experienced before when he was fascinated by the relation of body and mind: “For a season he inclined to the materialistic doctrines of the Darwinismus movement in Germany, and found a curious pleasure in tracing the thoughts and passions of men to some pearly cell in the brain, or some white nerve in the body” (113).

Gray’s association of thoughts and passions with a cell or nerve, recalls the work of Ernst Haeckel who had a great interest in ontogeny - cell biology - and phylogeny - evolutionary biology. According to Sander Gliboff,

Haeckel was, by far, the most successful popularizer of science for more than a generation in Germany . . . he was instrumental in propagating the principle of evolution by natural selection to the then very influential community of German biologists that had long adhered to Lamarckian ideas. (259)

In addition, Gray was delighted “in the conception of the absolute dependence of the spirit on certain physical conditions, morbid or healthy, normal or diseased” (113). This belief shows that he was greatly interested in the evolutionary biological relation between body and mind. However, Wilde wanted to ultimately express through Gray that “the senses, no less than the soul, have their spiritual mysteries to reveal” (113). He was more positive toward the body as an active subject of sense or its senses rather than the mind and spirit based upon the transcendental reason. Hence

sense is replaced by the beautiful body as a metaphor in this novel.

Oscar Wilde's interest and concern about contemporary science is well revealed in his *Commonplace Book* which was compiled of his memos of miscellaneous issues about literature, arts, philosophy and science; "mind versus matter, idealism versus realism, imagination versus reason, individuality versus race, experience versus heredity, consciousness versus external reality, freedom versus necessity." In particular, Wilde deals with "the vexing issues of the day" from the evolutionary point of view that he gained under the influence of Darwinian scientists like Clifford, Huxley, Tyndall, and Spencer (Foster 331-32). As can be clearly shown in entry 17 of his *Oxford Notebooks*, Wilde expresses his concern about the interconnection of human consciousness and the material body: "It is contended that as physiological activity is the property of every living cell, psychical activity must be so too and a "cell-soul" has been invented as a conception inseparable from that of life" (111-12). Oscar Wilde's biological conception of the organic relationship between body and consciousness makes obvious his acceptance of the materiality of life, full of tangible or intangible properties. For him, therefore, life is lived and progressed through the organic activities of body and mind. In that regard, the materiality of humans' emotions and sensations is well illuminated by what Lord Henry says in the novel:

Life is not governed by will or intention. Life is a question of nerves, and fibres, and slowly built-up cells in which thought hides itself and passion has its dreams. You may fancy yourself safe and think yourself strong. But a chance tone of colour in a room or a morning sky, a

particular perfume that you had once loved and that brings subtle memories with it, a line from a forgotten poem that you had come across again, a cadence from a piece of music that you had ceased to play... I tell you, that it is on things like these that our lives depend.

(182)

According to Lord Henry, a philosophical alter-ego of Wilde, thought and passion are correlated with, and realized by, nerves, fibres, and cells. That is, the intangible properties of color, perfume, poetic line, and musical cadence could be touchable or appreciated only through the tangible physical organs. For Wilde, the interdependence of body and mind is important. Thus, in entry 83 of his *Notebooks*, he emphasizes the co-influencing evolution of body and soul, or of organism and thought:

Just as the human embryo passes through all the stages of evolution from the lowest to the highest organism during the progress of its perfection, so the human mind must pass through all the stages which have been already taken in the progress of the intellectual world: neither in the world of thought or in that of matter is the past ever annihilated: progress in both must be made by slowly graduated stages from simple sensations, and formless protoplasms, to the highest differentiated organism and the purest abstractions of thought. (125)

This part is reminiscent of Darwin's comment about humans' evolution in *The Descent of Man*, suggesting that Wilde was attempting to establish his own aesthetic theory by applying a physically-implicated Darwin's evolution to the progress in



humans' mentality and sensation. In his essay entitled "The Rise of Historical Criticism" (1908), Wilde discusses the evolutionary progress the arts and history pursue, arguing that "the true motive and characteristic both of art and history" is "in the one case the creation of beauty, in the other the discovery of the laws of the evolution of progress" (26). To Wilde, an act of art is a pursuit of beauty and pleasure just as a lion killing other animals is the practice of pursuing a prey, which never needs a sense of morality. "Those who find beautiful meanings in beautiful things," Wilde notes in the preface to *Dorian Gray*, "are the cultivated. For these there is hope. They are the elect to whom beautiful things mean only Beauty. There is no such thing as a moral or an immoral book. Books are well written, or badly written. That is all" (3). To realize one's nature, it is necessary to realize one's feeling, thought, and dream, regardless of a sense of morality and responsibility in its practice:

To realize one's nature perfectly—that is what each of us is here for. People are afraid of themselves, nowadays. They have forgotten the highest of all duties, the duty that one owes to one's self. Of course they are charitable. They feed the hungry, and clothe the beggar. But their own souls starve, and are naked. Courage has gone out of our race. Perhaps we never really had it. The terror of society, which is the basis of morals, the terror of God, which is the secret of religion—these are the two things that govern us. . . . And yet, . . . I believe that if one man were to live out his life fully and completely, were to give form to every feeling, expression to every thought, reality to every dream—I believe that the world would gain such a fresh impulse of joy that we would

forget all the maladies of medievalism, and return to the Hellenic ideal—to something finer, richer, than the Hellenic ideal, it may be. But the bravest man amongst us is afraid of himself. The mutilation of the savage has its tragic survival in the self-denial that mars our lives. We are punished for our refusals. Every impulse that we strive to strangle broods in the mind, and poisons us. The body sins once, and has done with its sin, for action is a mode of purification. Nothing remains then but the recollection of a pleasure, or the luxury of a regret. The only way to get rid of a temptation is to yield to it. Resist it, and your soul grows sick with longing for the things it has forbidden to itself, with desire for what its monstrous laws have made monstrous and unlawful.

(18-19)

Arguing that “The only way to get rid of a temptation is to yield to it,” Wilde stresses that one should not be afraid of denying the standardized code of ethics. He employs Spencer’s notion of heterogeneity and individuation from his *Social Statistics* (1851) to implement his theory of aesthetics: “To possess a greater variety of senses, of instincts, of powers, of qualities - to be more complex in character and attributes, is to be more completely distinguishable from all other created things; or to exhibit a more marked individuality” (439). In other words, Wilde is pursuing the individualism that accompanies human evolution, at least, involved not merely distinguishability, but rebelliousness, a growing “revolt against authority,” adopting “the Spencerian formula that bodies or organisms progress toward greater and greater multiformity, or structural differentiation, when not subjected to undue external influence; when they

have not achieved multiformity, they are less resistant to outside forces and more liable to dissolution (Haley 216-19).

As a result, therefore, when “The decadents and their art did not fit in, they did not function organically within society's natural evolution, and therefore by definition they were degenerate rather than progressive” (Haley 215). As can be noticed in Wilde’s case, surplus seems likely to cause regression rather than progression, which in reward brings degeneration or devotion to social, emotional or bodily states:

Wilde knew, however, that Darwin's science of evolution fatally contaminates all privileged essentialist categories of race, class, gender or origins. Darwin insisted that since life itself has a common material origin, even species separation is relative. More shockingly, perhaps, to the Victorian psyche, this relative differentiation of species and the very capacity of life forms to survive arose chiefly through the promiscuous and prolific sexual production of frequent random variations, not the Spencerian or Haeckelerian conservation of superior pure genetic lines. From the multiple variations made possible by the 'impurities' of sexual reproduction there survived and thrived those with the ability to interact advantageously at any given time with changing environmental conditions. Darwin realised that nature was no Victorian maiden. Everywhere and at all times, natural life practised promiscuity, unconsciously trying out every possible permutation of sexual reproduction. More shockingly, this scandalously promiscuous energy actually drove evolution and ensured survival. He knew well that his

discoveries subverted Victorian sexual mores and flouted patriarchy, and at times he mischievously deployed the language of domesticity against itself to drive home his scandalous discoveries. (King 318-19)

As vividly described in the above paragraph, Oscar Wilde, much influenced by the evolution theory, incorporated 'the promiscuous and prolific sexual production of frequent random variations' into his novel and essays, only to acknowledge that 'Darwin's science of evolution fatally contaminates all privileged essentialist categories of race, class, gender or origins.' Gray's first intention in pursuit of art is diverted from the generally accepted social customs of artistic acts into the socially denounced degenerative artist. As an embodiment of human social cultural variations, he transgresses into an amoral social outcast. Wilde's belief in this revolutionary evolution theory has been developed into the foundational hedonistic artistry of body in which he could be engrossed, and is reflected in Lord Henry's hedonistic art theory. This example shows that biological phenomena in nature are closely related with all cultural discourse, as well as with artistic activity, in human society.

### **Evolutionary Consequence: Evolution vs. Degeneration**

The purpose of this section has been to show through the process of conflict that the body and mind have an indivisible ecological coexistence. However, the existence of the conflict means the reconciliation or union between homogeneous or heterogeneous organisms or groups is not easily made even in a co-influential and interactional relationship. This kind of conflicting relationship can be easily found in the relationship between Jekyll and Lanyon. It happens that Hyde visits Lanyon to

prove the successful validity of Jekyll's experiment and drink the prepared potion.

Lanyon witnesses the entire process of how Hyde turns into Jekyll. Lanyon is extremely shocked by this scene and confesses as such in his letter:

My life is shaken to its roots; sleep has left me; the deadliest terror sits by me at all hours of the day and night; and I feel that my days are numbered, and that I must die; and yet I shall die incredulous. As for the moral turpitude that man unveiled to me, even with tears of penitence, I cannot, even in memory, dwell on it without a start of horror. I will say but one thing, Utterson, and that (if you can bring your mind to credit it) will be more than enough. The creature who crept into my house that night was, on Jekyll's own confession, known by the name of Hyde and hunted for in every corner of the land as the murderer of Carew. (54)

This passage shows not only the personal conflict of the relationship between Jekyll and Hyde, but symbolizes the cultural and psychological conflict of society itself about the value of science during this time period. This kind of conflict reflects the after-shocks of Darwin's evolution theory into the context of human relationships. A birth of the provocative new theory that humans and monkeys branched and evolved from the same species was the shocking event that shook people's belief in the origin of human existence. The creative work of physical changes of body depicted in novels implies the profane manipulation of the sacred human created by God into people who are no more than simple objects. Furthermore, the novels examined in this chapter

imply that despite the stunning development of science and technology, mankind could experience moral, mental, and cultural regression through evolutionary changes.

Hence Utterson refers to Hyde as a monkey degenerated from a human in *Dr. Jekyll and Mr. Hyde*, morally corrupted Dorian is portrayed as the disgustingly degenerated old man in *the Picture of Dorian Gray*, and humans are now no higher than animals in *The Island of Dr. Moreau*.

In fact, novels that deal with the future form of humans show little improvement. Stiles says as much, commenting about Wells' novels as follows: "Beginning with the eponymous mad-scientist villain of *The Island of Dr. Moreau* and continuing with alien invasion narratives like *The War of the Worlds* (1897–98) and *The First Men in the Moon* (1901), Wells depicts brains becoming steadily larger and more powerful as bodies grow smaller and more useless, emotions increasingly muted, and conscience all but silenced" (Stiles 319). Judging from the prevalent impact of the evolutionary theory, this kind of description of humans in the future reflects the social sentiment that the excessive advancement of natural science would bring social regression and cultural corruption rather than any constructive evolution of human society.

As can be seen in *The Island of Dr. Moreau*, the memory of the island in the mind of the main character, Edward Prendick, has a traumatic effect on him when he returns to London. Prendick's statement about what happened on the island produces a scathing response, which is not that different from the response that Darwin's evolution theory was afforded. When he delivers to others what he saw and experienced on the island, he is

considered mad and so becomes more isolated. Frendick's confession reveals that point vividly:

Neither the captain nor the mate would believe my story, judging that solitude and danger had made me mad; and fearing their opinion might be that of others, I refrained from telling my adventure further, and professed to recall nothing that had happened to me between the loss of the *Lady Vain* and the time when I was picked up again,—the space of a year. I had to act with the utmost circumspection to save myself from the suspicion of insanity. . . . No one would believe me; I was almost as queer to men as I had been to the Beast People. I may have caught something of the natural wildness of my companions. They say that terror is a disease, and anyhow I can witness that for several years now a restless fear has dwelt in my mind,—such a restless fear as a half-tamed lion cub may feel. (137-38)

It is not enough that he is already a scientist who “had spent some years at the Royal College of Science, and had done some research in biology under Huxley” (26). He has to constantly subject himself to self-surveillance because of the estrangement he produces not only in those he encounters on his journey but on those back in ‘civilized’ London who have not shared his experiences. The act of encountering the transformed individual is enough to induce horror. This phenomenon becomes more apparent in the relationship between Dr. Jekyll and Dr. Lanyon in *Dr. Jekyll and Mr. Hyde*. The trauma that Dr. Lanyon suffers by noticing Mr. Hyde becoming Mr. Jekyll is far beyond the reactions of

those who encounter Freud. The contents of the letter, which Dr. Lanyon left to Mr. Utterson, symbolically illuminate effectively how much shock Dr. Jekyll's evolutionary change produces in the Doctor:

What he told me in the next hour, I cannot bring my mind to set on paper. I saw what I saw, I heard what I heard, and my soul sickened at it; and yet now when that sight has faded from my eyes, I ask myself if I believe it, and I cannot answer. My life is shaken to its roots; sleep has left me; the deadliest terror sits by me at all hours of the day and night; and I feel that my days are numbered, and that I must die; and yet I shall die incredulous. As for the moral turpitude that man unveiled to me, even with tears of penitence, I cannot, even in memory, dwell on it without a start of horror. (54)

Dr. Lanyon is almost shocked to death when he realizes that the ape-like ugly Hyde is his old friend, Dr. Jekyll. Symbolically speaking, Dr. Lanyon's shock implies the overall shock that Darwin's evolution theory has brought to all Victorian people. The shock is also a representation of the trauma for a reader, caused by the incredulous fact that the Hyde-like cruel ape could evolve into the Jekyll-like rational man. Figuratively speaking, the story implies that radical scientific theories like Darwin's were almost impossible to accept, even to Dr. Lanyon, who is Dr. Jekyll's companion and competitor. To him, the figure of Hyde is a symbol of unbridled and devilish science. Thus, the conflict between them caused by too big a gap in their different theories has situated them in an irrevocable and "incurable" (32) relation, and finally



driven Dr. Lanyon to sickness and death. Dr. Lanyon seems to reply to the unorthodoxy of Darwinian theory in his letter: “I ask myself if I believe it, and I cannot answer. My life is shaken to its roots, . . . I must die; and yet I shall die incredulous” (54).

As can be perceived in Hyde’s figure and behavior, most of the degenerated and pre-evolved human features look not only ugly, heinous, and disgusting, but also reveal an immorality and cruelty in their behavior. Such features and behaviors hold evolutionary implications in association with Lombroso’s work in criminal anthropology:

It was believed by a number of eminent authorities that the individual 'recapitulated' in his or her own development (from foetus to adult) an abbreviated record of the various states of evolutionary growth through which the human species had evolved; ontogeny recapitulating phylogeny as the biologists put it. This meant that the human child was considered to be closer to less evolved life forms - 'primitives' and animals, but also criminals and lunatics. (Mighall 151)

Just as humans in Lombroso’s primitive animal stage were assumed to fundamentally possess an animal’s properties, avarice and cruelty, so ape-like human figures in Victorian novels function like anti-anthropocentric instruments to deny humans any dignity and greatness.

Nicole Hahn Rafter and Mary Gibson, translators and editors of the English version of *Criminal Man*, detail how Lombroso compares the characteristics of

human's retrogressive evolution to those of pre-evolution stage of fetus and child or to those of atavism:

First, he characterizes all children as criminal because they display atavistic psychological traits such as vanity, cruelty, laziness, fickleness, and dishonesty. For Lombroso, such behavior could be explained by the nineteenth-century scientific maxim, attributed to Ernst Haeckel, that "ontology reproduces phylogeny," meaning that the life of each individual recapitulates the evolution of the species; thus the embryo is equivalent to the animal stage of evolution and childhood to that of primitive man. At puberty, according to Lombroso, most children lose their criminal characteristics and mature into normal adulthood, much as savages evolved into civilized men. (19)

If Lombroso's theory was applied to the animal-like characters in the science fiction, they still possess anti-evolutionary animalistic characteristics like rapacity and cruelty. In particular, animal-like or ape-like human figures in the fiction function as useful devices to deny the traditional reading of the progressiveness of humanity. Therefore, it becomes clear why Hyde, the Morlocks, animal humans, and Martians turn out to be immoral and cruel. They had degenerated as expected.

Dr. Moreau's island geographically resembles Darwin's Galapagos archipelago. Being isolated, his island is a place of experimentation in which the process of evolving can be clinically observed:

Apart from a quasi-allegorical setup that promotes comparison between

Doctor Moreau's scientific activities and evolution, the novel establishes three direct connections to Charles Darwin. First, the protagonist and narrator, Edward Prendick, reveals that he, like H. G. Wells himself, had been the student of the great biologist and evolutionist Thomas Huxley, Darwin's disciple, friend, and champion. A second marker of the story's Darwinian provenance is the placement of Moreau's fictional island in the actual vicinity of the Galapagos, islands that Darwin visited and made famous. Although during his stay there Darwin did not recognize that they and their fauna constituted a virtual laboratory for natural selection, after his return to England they provided crucial hints and evidence for his theory – a matter discussed in the epilogue to his book. (Glendening 40)

In this respect, Moreau was practicing what Darwin had described in *The Origin of Species* as “the advantages of cross-fertilization” and “how various domestic animals were ‘descended from two or more aboriginal species,’” and in *The Descent of Man* as “the frightful prospect of a similar ‘intercrossing of species’ involving man and apes” (Dawson 67). Glendening addresses H. G. Wells' challenging attempt to blur the borderline between humans and animals, intentionally or unintentionally, in his portrayal of fictional events:

Far more than any contemporary novelist, H. G. Wells understood both evolutionary theory and the disturbing story it told about humanity. Wells's first novel, *The Time Machine* (1894), a discussion of which

will conclude this chapter, had explored many issues concerning evolution but especially its potential for both progress and degeneration as forms of physiological and cultural change colored by moral valuations. It does this particularly by examining the relationship between humans and animals. Giving fuller play to the same concerns, *The Island of Doctor Moreau* (1896) recognizes that, in Darwinian and other guises, evolutionary theory created a muddle in its implications for humanity. The novel enacts this situation by consistently disrupting the dualistic categories of progress/degeneration, human/animal, nature/culture, and, incorporating the others, order/chaos. The novel dramatizes the experience of one caught in the web of indeterminacy constituted by these evolution-based confusions, and it does so especially through its recreation of Darwin's entangled bank. (39)

As can be clearly seen in Jekyll's transformation into apelike Hyde in *Dr. Jekyll and Mr. Hyde*, the foreshadowing of human evolution into Octopus-like humans with big heads in *The War of the Worlds*, the dehumanization of future humans in *The Time Machine*, and the contradictory features of enforced evolution in *The Island of Dr. Moreau*, the characteristics of evolution are portrayed as negative rather than positive. The figures of the objects being evolved become ugly and disgusting, their behaviors immoral and cruel. Unlike the general concept of evolution from low to high scale, such evolutionary phenomena show that the scientific development could bring devolution and degeneration to human as well as to living things. The idea of

degeneration caused by evolution has made some scientists articulate their fear of the evolution by introducing a theory of degeneration.

In the late nineteenth century, E. R. Lankester, a representative theorist of degeneration, praises Darwin's evolution theory and expresses his concern about the theory as well:

In the form in which Mr. Darwin presented his view to the world it was no longer a mere guess. He had already tried it and proved it in an immense series of observations; it had already been converted by twenty years' labour on his part into an established doctrine, and the twenty years which have passed since he published *the Origin of Species* have only served to confirm, by thousands of additional tests, the truth of his original guess. (10)

Despite his acknowledgment of Darwin's establishment, "evolution, to Lankester, was not necessarily synonymous with progress. Indeed, he believed that evolution could just as easily lead in the opposite direction, to decadence and degeneration" (Milner 92). Doubtful of the tacit assumption of universal progress by evolution, Lankester states about degeneration:

In accordance with a tacit assumption of universal progress – an unreasoning optimism – we are accustomed to regard ourselves as necessarily progressing, as necessarily having arrived at a higher and more elaborate condition than that which our ancestors reached, and as destined to progress still further. On the other hand, it is well to

remember that we are subject to the general laws of evolution, and are as likely to degenerate as to progress. (59-60)

Regarding the general laws of evolution, it seems that Lankester shared much in common about evolution with Wells. He agreed with ideas of many biologists such as Lankester who argued that a gradual degeneration would occur due to “comfort and security” that could be brought by scientific progress, as shown in *The Time Machine*: “Under the new conditions of perfect comfort and security, that restless energy, that with us is strength, would become weakness. Even in our own time certain tendencies and desires, once necessary to survival, are a constant source of failure. Physical courage and the love of battle, for instance, are no great help—may even be hindrances—to a civilized man. And in a state of physical balance and security, power, intellectual as well as physical, would be out of place” (36).

In particular, Wells and Lankester, sharing the same idea about the negative phenomenon of evolution, emphasized the importance of education to protect the degeneration caused by comfort and security which could be generated from development of science and technology:

Lankester and Wells shared the view that two processes—the physical degeneration of individual organisms in response to the absence of a challenging environment, and the intellectual degeneration of social groups in response to a lack of cultural stimulation—were comparable in nature. The character of this connection, with its relation of individual and collective fates, led them to claim that scientific

education, rather than eugenics, was the most useful response to the threat of degeneration. (Barnett 206)

They address the belief that when a sense of security is felt, an individual body is degenerated and when a cultural stimulation disappears, the intellectual component of the social members is degenerated. Therefore, the necessity of continuous education is emphasized to stop the negative side-effects of evolution. Their enlightening remarks about the contradictions of Darwin theory, as Brian Baker points out, address “the problems of an evolutionary theory that did not include the element of progress” and “outlines the evidence for processes of natural selection that led not to greater complexity, but to simpler, “less evolved” forms” (206).

## CHAPTER 3

### WHAT THEY CREATED: HYBRID CREATURES AND MONSTERS

This chapter will focus on Darwin and Spencer's concepts of the hybrid and hybridity reflected in nineteenth century fiction, specifically in terms of the representation of hybrid creatures and characters such as Stevenson's Dr. Jekyll, Wells' Griffith, Shelley's Frankenstein and others. The nature of this hybridity – the evolution of bodies of various forms, often half-human and half-animal – and the scientific, cultural, social, and religious registers of the Victorian society that were subtly inscribed into those bodies will be explicated in this chapter by analyzing Darwin's evolutionary theory as it applies to Mary Shelley's *Frankenstein* (1818), H. G. Wells' *The Time Machine* (1895), *The Island of Dr Moreau* (1896), *The Invisible Man* (1897), *The War of the Worlds* (1898), and Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde* (1886) and "The Beach of Falesá: Being the Narrative of a South Sea Trade" (1893).

This chapter will be subdivided into four sections. The first, "Hybrid and Hybridization on the nineteenth Century Entangled Bank" will discuss the meaning of 'hybrid' in the nineteenth century society and how hybridity influenced the nineteenth century culture. Second, "Hybrids of Human and Animal in the 19<sup>th</sup> Century Fiction" will deal with certain kinds of hybrid creatures, particularly those located between human and animal or between nature and science such as Frankenstein's monster, Dr. Moreau's half-human and half-animal, and an imaginary beast figure in Stevenson's "Beast of Falesa." Third, the section entitled "Crisis of Hybrid Identity in The Heterogeneous Body" focuses on the change in the identity of the hybrid humans made by science and technology, examining particularly how they undergo serious



difficulties in adapting to the environment as they are regarded and excluded as abnormal monsters or creatures. Fourth, “A Hybrid of Nature and Science: Frankenstein’s Monster and the Sublime” will address a hybrid of science and nature – the monster, which turns out to maintain the characteristics both of nature and science, while not belonging to either one of them.

### **Hybrid and Hybridity on the Victorian Entangled Bank:**

#### **Background and Context**

The term, ‘hybrid,’ was coined as a biological term to mean the abnormal offspring produced from crossbreeding between different species. In the nineteenth century, this hybridity was also regarded as the result of a synthesis of natural selection, mutation, and adaptation, much of which took place in the Victorian lab.

Despite the optimistic attitude towards the role played by science and technology in the evolution of this hybrid form, there was skepticism from those who worried about changes in the identity of the human form. This has always been an anxiety in critical discourse. While Katherine Hayles argues in *How We Became Posthuman* that the Cyborg is “an improved hybrid species that has the capacity to be humanity's evolutionary successor” (119), she also points out that the hybrid between machine and human, or human and animal, has resulted in a new identity, which is different from that of a conventional human. The appearance of the cyborg hybrid concept has triggered not only a change in the concept of human body, but also a big change in human identity itself. As Donna Haraway has also commented, “we are in a knot of species coshaping one another in layers of reciprocating complexity all the way down” (42). Those comments imply that the change in the human body and identity is

inevitable even though we do not know the consequences of this change. In this context, the hybrid creatures in Victorian novels serve not only as a mirror of the future human but also provide a way to investigate how science and technology have interfered with the nature of the human body, influenced human identity, and played a role in how Victorian culture understood what it meant to be human.

The hybrid form of creatures was not, of course, exclusive to the nineteenth century: “The most widespread way of representing animals has been to assign them figurative cultural, social, or political meaning, that is, to depict them as metaphors or allegories for human beings or human traits with which a particular kind of animal can be associated” (Palmeri 3). In particular, ancient Assyrian and Egyptian chimera sculptures fascinated and shocked Victorian British people and provided writers with fresh artistic inspiration. In "Assyrian Monsters and Domestic Chimeras," Deborah A. Thomas details the public response to the ancient Assyrian hybrid form of sculptures, admiring the research legacy of Austen Henry Layard, a leading anthropologist of the Victorian era:

Layard made two archaeological expeditions to the Middle East—the first from October 1845 to June 1847 and again from October 1849 to April 1851—and produced eagerly read books about both trips as well as a treasure trove of artifacts. His discoveries aroused extraordinary excitement in England. *The London Times* described *Nineveh and Its Remains*, Layard’s 1849 book about his first expedition, as “the most extraordinary work of the present age. (155)

Thomas focuses in particular on the human-headed bull sculptures which made Victorians “fascinated by hybrids...uneasy about the freakishness of certain heterogeneous combinations” (155). Layard’s work was in the foreground of scientists’ interest in the possibility of cross-breeding different species. However, their discussion soon focused on the reproduction among those hybrid organisms which had experienced problems with sterility. Darwin explains this issue in “Hybridism,” a chapter of *The Origin of Species*, as follows:

The view generally entertained by naturalists is that species, when intercrossed, have been specially endowed with the quality of sterility, in order to prevent the confusion of all organic forms. . . . On the theory of natural selection the case is especially important, inasmuch as the sterility of hybrids could not possibly be of an advantage to them, and therefore could not have been acquired by the continued preservation of successive profitable degrees of sterility. I hope, however, to be able to show that sterility is not a specially acquired or endowed quality, but is incidental on other acquired differences. (245)

Elaborating that sterility is an incidental rather than innate quality required to maintain the balance of an ecological system, Darwin intended to show that there must be some rationales even for cross-breeding between different species. In other words, even sterility must be based on the principles of natural selection. Regarding the hybrid, T. H. Huxley also made a similar statement in *On the Origin of Species or the Causes of the Phenomena of Organic Nature* (1863). Huxley explained that mongrel

offspring are significantly different from the hybrid ones, arguing that "mongrels" were crosses between distinct races, whereas "hybrids" were crosses between distinct species.<sup>5</sup>

Thus you see that there is a great difference between "mongrels," which are crosses between distinct races, and "hybrids," which are crosses between distinct species. The mongrels are, so far as we know, fertile with one another. But between species, in many cases, you cannot succeed in obtaining even the first cross: at any rate it is quite certain that the hybrids are often absolutely infertile one with another. (107)

As Huxley mentioned, hybrids between different species cannot reproduce at all. For example, a mule is one of the typical hybrids, a sterile animal of a horse and donkey. The mule cannot reproduce to maintain its species. Huxley's concept of hybridity led to the discussion about whether offspring between whites and blacks, and between people of color should be viewed in terms of mongrels or hybrids. As

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<sup>5</sup> In support of Darwin's evolution theory, Huxley began to develop an interest in social evolution based upon reason and natural science, and coined a new term 'agnosticism' which for him meant that that no one can know the existence of anything beyond the empirical phenomena. In "On the Physical Basis of Life," Huxley says, "all the multifarious and complicated activities of man are directed towards the maintenance and development of the body, or they effect transitory changes in the relative positions of parts of the body, or they tend towards the continuance of the species" (274). This shows his interest in the relation between a keep of species and body change.

succinctly stated in Robert Young's statement in *Colonial Desire: Hybridity in Theory, Culture, and Race*, "Much of anthropology hung . . . on this single issue. . . . From the 1840s onwards, the question of species, and therefore of hybridity, was always placed at the centre of discussions and was consistently and comprehensively treated" (7).

At first, as Young suggests, Victorian people considered black people as naturally belonging to an entirely different species from white people. Racial prejudice was so extensive that the offspring between the native Pacific islanders and white people who emigrated overseas were regarded as a different species. However, unlike the theory that hybrid offspring would not be capable of reproduction, it had been proved that the colonial offspring of black and white people or between other colors of human races could reproduce. As a consequence, it was proved that the human offspring of different races was only a diversity of the same human species:

The use of the term 'hybridity' to describe the offspring of humans of different races implied, by contrast, that the different races were different species: if the hybrid issue was successful through several generations, then it was taken to prove that humans were all one species, with the different races merely sub-groups or varieties - which meant that technically it was no longer hybridity at all. (Young 9-10)

Although it seemed the misunderstanding of the concept of 'hybrid' disappeared, when considering humans, nevertheless, as Lola Young states, this issue did not go away:

[A]nxieties about racial purity, and thus interracial sexuality and the survival of the superior 'race' are embedded in the business of 'doing science' . . . historically 'hybridity' was centrally concerned with the prospects for human fertility across or between 'races.' It was feared that "the children of interracial sexual relations would bring about the degeneration of white societies and the debasement of their cultures. (157)

Lola Young's comment on the racial hybrid, in which the offspring derived from interracial relations would bring about the devolution of white society and a concomitant devaluation of culture, reflected Matthew Arnold's concerns about national identity:

We shall see that even what is often considered a founding text of English Culture, Matthew Arnold's *Culture and Anarchy* (1869), is predicated on the fact that English culture is lacking, lacks something, and acts out an inner dissonance that constitutes its secret, riven self. For the past few centuries Englishness has often been constructed a heterogeneous, conflictual composite of contrary elements, an identity which is not identical with itself. The whole problem - but has it been a problem? - for Englishness is that it has never been successfully characterized by an essential, core identity from which the other is excluded. (3)

As such, the hybrid phenomena could be considered as a threat to social culture and tradition, and as a sign of apprehension and anxiety among conservative individuals or organizations. U. C. Knoeflamacher's comment is instructive here: "Since the word "hybrid" so frequently appears in our most positive accounts of new automobiles, new mixed-media forms, and new technological and biological improvements, it seems well worth remembering that earlier cultures were likely to be distrustful, and even fearful, of "mongrel" mixtures they saw as dangerous deformations" (1). Even though Knoeflamacher uses the term "mongrel" in a different sense, his statement clearly shows that the anxious factors in society are reflected in the literary works of the times. Particularly, in the years immediately after the publication of *The Origin of Species* in 1859, a decade of sensationalism occurred. Darwinism deconstructed the ontological beliefs and truth about the scale of human mind and body in the period and its effect was felt in literature. Susan David Bernstein makes the following statement about the relation between Darwinian science and sensation fiction:

During the decade of sensationalism in the 1860s, links between popular science and fiction erupted around dizzy and disorienting scenes of an unstable universe of planets, or society in flux. It is worth noting too that *On the Origin of Species* concludes with a quick allusion to "the Creator" as almost a panacea after hundreds of pages meticulously arguing for evolution through natural selection. But, like "Sensationalism in Science" and sensation fiction, the words of

Darwin's final sentence also sketch a very different universe beset by constant and unfathomable changes, as "several powers" that generate "endless forms" beyond a central and ultimate divine force. (475)

The 1860s was a period of turbulence that showed concerns about the moral corruption that the sensation novels caused during the Victorian era. Interestingly, the contents of sensation novels apply the evolutionary and biological hybrid phenomena into the literary work, stimulating social morals and sexual desires as a consequence. Although the lesson of the reward and punishment for good and evil was clearly represented in the sensation novels, it was believed that the novels would ultimately devalue society. As shown in Jonathan Smith's "Domestic Hybrids," Victorian artists like Ruskin related their anxiety about the cultural trait of 'hybridism' in the novel:

Like many of his fellow cultural commentators, Ruskin worried that modern fiction, particularly the sensational variety, was both a sign of Victorian culture's moral decay and a vehicle for further unwholesome moral influence. It appeared to the lowest tastes and appetites; it titillated rather than educated or edified. Its fascination with sexual and criminal misbehavior was debasing and potentially subversive even when punishments and rewards were ultimately meted out in morally appropriate ways. Particularly troubling was the way sensation fiction's thrilling plots effectively combined gothic romance with domestic realism - their horrors played out not in foreign castles during earlier centuries but in contemporary English cities and middle-and upper-



class English drawing rooms. The form itself was a rapidly proliferating hybrid, and the illicit sexuality and violence it portrayed in domestic settings was little different from the behavior Darwin was revealing in the common plants of English meadows and marshes. (867-68)

The most apparent point in the argument on the hybridity of the sensation novel and in the Ruskin passage is that the sexuality and violence present in literature were mirrored in the qualities observed in the natural meadows and marshes in which the hybrid activities of plants, birds, insects and worms could be observed. The images of these meadows and marshes remind us of Charles Darwin's conclusion in which he describes an entangled bank full of natural faunas and floras:

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of

nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved. (579)

As can be seen in Darwin's elaboration about the entangled bank of organic things, many evolutions and hybridizations were noticed by Darwin and other scientific observers who perceived that the mixture of species occurred during a struggle for life. There was little distinction then between the struggle in the meadow and the household, and soon enough the hybridity derived from the biological data field was considered to be closely related to immoral sexuality and subversive violence in human society.

### **Hybrid of Human and Animal in the Victorian Fiction**

Beyond imaging the combination of animal and animal, or plant and plant, the hybrid creature of human and animal could be easily created by other writers and artists. But like Ruskin's observations, the salient feature of these works was the fear and concern expressed by the narrators about hybridism that arose after the publication of the *Origin of Species*.

Shelley's *Frankenstein*, Stevenson's *Dr. Jekyll and Mr. Hyde*, and many of H. G. Wells' works clearly show hybrid creatures in many different ways. Frankenstein's

monster is certainly a creature made of different parts of bodies and organs from different animal species because the bodies and organs are taken from the dissecting room and the slaughterhouse by the young scientist. Stephanie Lowe meticulously investigates the content of the text and rejects the premise that the Frankenstein's monster's body structure was entirely formed only with human organs:

Comprised of materials furnished from "the dissecting room and the slaughterhouse," Victor Frankenstein's monstrous creation is an assemblage of parts collated from multiple animal species. The materials collected from the slaughterhouse are those of animals other than humans, mostly likely cows, sheep, pigs, birds, or horses; those collected from the dissecting room might be the remnants of pigs, rabbits, birds, dogs, cats, or apes and other primates including humans - given the creature's generally hominid form, this last certainly must have been included in its composition. Frankenstein's creation thus incorporates into its very person, as it were, the remains of humans, who had not been killed for food or for the purpose of dissection, as well as those of members of an unspecified variety of other animal species who had been put to death intentionally in order to furnish meat for human consumption or information that would contribute to scientific understanding of biological systems. The secret of the creation's animation is similarly derived from both human and non-human animal sources, gleaned from decomposing human corpses in

charnel houses and from experiments on animals in the laboratory.

(137)

Although the creature resembles a human form, it could be called a ‘creature,’ ‘animal,’ or ‘monster’ because it has hybrid traits. Equally interesting is the discussion of the reproduction of the hybrid creatures. The monster asks Frankenstein to create his mate, and is so eager for this to occur that he even promises to ostracize himself and his potential mate from civilized society: “I swear to you, by the earth which I inhabit, and by you that made me, that, with the companion you bestow, I will quit the neighborhood of man, and dwell, as it may chance, in the most savage of places”

(121). Though Frankenstein agrees to do so, moved as he is by the creature's rhetorical speech, he destroys the female creature at the brink of its completion, afraid that “if they were to leave Europe and inhabit the deserts of the new world, . . . a race of devils would be propagated upon the earth who might make the very existence of the species of man a condition precarious and full of terror” (140). Shelley does not consider that hybridity might cause sterility. Instead, Frankenstein shows great fear towards the offspring of the hybrid creatures, worrying that they could harm humans and their offspring. For Shelley, such a possibility aligns her with those scientists who were concerned with hybridity and its consequences for mankind. Shelley was not the only writer with these concerns. Ann C. Colley quotes Stevenson's “Beach of Falesá” to show one aspect of hybridism more specifically:

Stevenson gets Wiltshire to invoke yet another hybridic form so that the trader may tell his tale in a manner that reflects the compelling

condition of hybridity inhabiting the island. He summons the chimera, a composite of disjunctive parts, a cross between human and animal.

Wiltshire looks at Uma for the first time and sees "an island maid, with ... a shy, strange blindish look, between a cat's and a baby's." . . .

Relying on the man-animal hybrid, Wiltshire also describes Captain Randall as being as "grey as a badger"; and when Wiltshire sees the natives staring at his tabooed house, he thinks of their posture as being "as straight as pointer dogs." (137-38)

Colley is referring to John Wiltshire, both a main character and a narrator in the story. As a British trader, he lands on a small island called Falesá. When he arrives on the island, he meets another trader, Case, who has already settled down on the island with natives. Case arranges for him to get married to a native girl, Uma. While staying on the island, he raises a doubt about the influence that Case has over many of the villagers. He wants to find how the man exercises demonic powers over the natives. He realizes that the identity of the unnamed hybrid is one of the mysterious secrets hidden in this island. Actually in this text, the imaginary hybrid creature in the form of half-animal and half-human exists deep in his consciousness and it always presents itself as a continuously invisible and threatening entity. He doubts that the secret of the island is the invisible hybrid creature that is controlled in the dark by Case, a dictatorial ruler of the island. Instead, the imaginary hybrid is the dark power that makes it possible for Case to rule the island. Wiltshire comments as follows:

It was my first idea to light up and be getting homeward; for the darkness and the glimmer of the dead wood and the shadows of the lantern made me lonely. But I knew where one of the harps hung; it seemed a pity it shouldn't go with the rest; and at the same time I couldn't help letting on to myself that I was mortal tired of my employment, and would like best to be at home and have the door shut. I stepped out of the cellar and argued it fore and back. There was a sound of the sea far down below me on the coast; nearer hand not a leaf stirred; I might have been the only living creature this side of Cape Horn. Well, as I stood there thinking, it seemed the bush woke and became full of little noises. Little noises they were, and nothing to hurt - a bit of a crackle, a bit of a rush - but the breath jumped right out of me and my throat went as dry as a biscuit. It wasn't Case I was afraid of, which would have been common-sense; I never thought of Case; what took me, as sharp as the colic, was the old wives' tales, the devil-women and the man- pigs. It was the toss of a penny whether I should run: but I got a purchase on myself, and stepped out, and held up the lantern (like a fool) and looked all round. (48)

He ultimately realizes that the seemingly hybrid entity is just an illusion that exists only to himself. It is certain that he subconsciously ignores the independent identity of the natives, believing that they are a hybrid between humans and animals, as indicated in his narrative of Uma who has the look of a cat and a baby. Finally,

when he kills Case in the dark forest, he gets disillusioned about the secrets that he has kept to himself. He realizes that the fearful but oblivious entity finally revealed is not the human hybrid that does not exist, but Case's trick of using lantern light and a harp's sound in the darkness, by whose strange power the other side of the forest on the island is ruled by.

Like Wiltshire, Prendick in *The Island of Dr. Moreau* experiences hybridism as the essential secret on the island of Moreau who has created half-human and half-animal hybrid creatures through biological and physiological experiments. Dr. Moreau transforms an animal to a human resemblance through limb amputation and suturing procedure in a laboratory called 'The House of Pain' which is "defended by an iron bar" (30). He soon experiences the sounds of the experimentation at work. He hears the cry of the animals: "Then the noise overhead began again, a snarling growl and the voice of a human being together. Then another voice, telling some "Heaven-forsaken idiot" to desist" (6). He wonders what they are, asking himself: "What are these beasts for? Merchandise, curious? Does the captain think he is going to sell them somewhere in the South Seas?" (10-11). Even though many animals are caged on the island, he does not know what Dr. Moreau wants with the beasts. However, he suddenly has the chance to witness what they are:

Suddenly, as I watched their grotesque and unaccountable gestures, I perceived clearly for the first time what it was that had offended me, what had given me the two inconsistent and conflicting impressions of utter strangeness and yet of the strangest familiarity. The three creatures

engaged in this mysterious rite were human in shape, and yet human beings with the strangest air about them of some familiar animal. Each of these creatures, despite its human form, its rag of clothing, and the rough humanity of its bodily form, had woven into it—into its movements, into the expression of its countenance, into its whole presence—some now irresistible suggestion of a hog, a swinish taint, the unmistakable mark of the beast. (42)

Prendick's curiosity ends when he comes to realize that "vivisection [is] to account for this secrecy" (3). He begins to pay attention to the figures of the animals on the island: "the pointed ears and luminous eyes of Montgomery's attendant" (33). He asks to himself: "What could it all mean? A locked enclosure on a lonely island, a notorious vivisector, and these crippled and distorted men?" (33) The half human creatures behave as clumsily as 'crippled and distorted men' even though they are vivisected to be reborn as humans:

Then I saw it was a man, going on all-fours like a beast. He was clothed in bluish cloth, and was of a copper-coloured hue, with black hair. It seemed that grotesque ugliness was an invariable character of these islanders. I could hear the suck of the water at his lips as he drank. (40)

Wells was so influenced by Darwin's theory that he created in *The Island of Dr. Moreau* a scientist devoted to experiment designed to make such hybrid creatures. Likewise, Darwin's theory triggered curiosity among many scientists about the possibility of an offspring between humans and anthropoid apes, and ultimately this



led to an actual experiment to confirm it. According to Gowan Dawson, “Scientific interest in human-simian hybridity actually intensified over the following decades, and in 1905 Ernest Haeckel, Germany’s leading advocate of Darwinism since the 1860s, even gave encouragement to a speculative, and ultimately unsuccessful, scheme by the Dutch naturalist Herman Moens to artificially inseminate female apes with human sperm, advising that the two species were sufficiently closely related to permit such a radical hybridization” (68).

### **Crisis of Hybrid Identity in Heterogeneous Body**

Criticism about Darwin’s evolution theory was acutely focused on his claim that humans and primitives came from the same origin. Satirized by many critics, Darwin was often caricatured as a chimpanzee in magazines such as *The Hornet* (1871). His biggest claim was for monogenesis which argued that mankind should be treated “as a single species with a single evolutionary origin” (Brantlinger 150). According to Darwin, White, Black, and Asian human forms were developed by adaptation and evolution for the survival of the fittest. Nonetheless, it was thought that there had been racial homogeneity, in which reproduction had occurred between individual humans of the same race. Under these conditions, and whether white, black, or yellow, they have separately lived in different areas without much evidence of interracial marriage. As a result, each of the races has kept the homogeneous racial identity. However, in the nineteenth century, with the development of the steam engine and other types of transportation, people could move easily to the other parts of the world for commercial and imperial purposes. As a result, human and material resources were exchanged much more extensively, which consequently has brought

about a gradual change in racial distribution. Heterogeneity in turn later caused the change in racial or human identity. As Robert Young comments, the Victorian period accelerated the process of racial interchange and foreshadowed the racial complexity of contemporary culture:

By the 1850s there were already those such as Herbert Spencer who were asserting that 'progress consists in a change from the homogeneous to the heterogeneous.' Today's comparative certainty has arisen because heterogeneity, cultural interchange and diversity have now become the self-conscious identity of modern society. (Young 4)

Young's key text here is Herbert Spencer's article "Progress: The Law and Causes" (1857), in which Spencer argues that 'progress consists in a change from the homogeneous to the heterogeneous.' In the article, Spencer maintained that "the series of changes gone through during the development of a seed into a tree, or an ovum into an animal, constitute an advance from homogeneity of structure to heterogeneity of structure" (2). He then applied this developing theory to all the areas ranging from organic life, to social and political organization, and to arts and literature. For example, he argues that "Whether an advance from the homogeneous to the heterogeneous is or is not displayed in the biological history of the globe, it is clearly enough displayed in the progress of the latest and most heterogeneous creature—Man" (10) and that "the transformation of the homogeneous into the heterogeneous is consequent upon the universal principle, that every active force produces more than one change" (49). Even the bodily change, in the process of adaptation, struggle, and evolution in life, has

resulted in a heterogeneous entity within the traditional epistemological subject. That means that various bodily and physical phenomena caused by the development of natural science found their ways into human culture, the human form and the human mind.

Works such as *Frankenstein* are a good example of mankind's ontological change or struggle caused by the development of natural science that had brought changes to human's identity in ways that humans did not intend. Frankenstein's creature comes to express agony over his own hybrid identity as he is caught between being human and being a monstrous animal. While he desires to ascertain his identity as a human being, he finds out that all the humans he encounters only treat him as a dangerous monster or animal and that they identify him as an inhuman object just as he identifies himself as a subjective being of uncertainty. Now it becomes clear that it is this ontological crisis he suffers that causes him to curse Frankenstein, his creator. In the same context, Dr. Jekyll in *Dr. Jekyll and Mr. Hyde* thinks out a way to free human from the agony of conscience by completely dividing the mind into bad and good constitutive parts. A "transcendental medicine," made through chemical experiment, keeps Dr. Jekyll as the transformed Hyde until the potion is effective. Yet, it degenerates him into an incarnation of pure evil without a drop of good red blood and he never feels any guilt or pain for the vile actions he commits. Furthermore, having two existences in one body changes Dr. Jekyll's identity and finally leads him to his death. For the similar reason that Jekyll tries the chemical experiment to solve his agonistic problem, Griffin, in Wells' *Invisible Man*, attempts to realize "the individual's desire to transgress human boundaries in the name of science" (Sirabian

382). Griffin as a scientist conducts secret experiments to make things invisible by using and applying the characteristics of body color and natural light. Griffin explains this process to Dr. Kemp, a former professor of Griffin's in his college days.

"Precisely," said Griffin. "But consider: Visibility depends on the action of the visible bodies on light. Either a body absorbs light, or it reflects or refracts it, or does all these things. If it neither reflects nor refracts nor absorbs light, it cannot of itself be visible. You see an opaque red box, for instance, because the colour absorbs some of the light and reflects the rest, all the red part of the light, to you. If it did not absorb any particular part of the light, but reflected it all, then it would be a shining white box. Silver! A diamond box would neither absorb much of the light nor reflect much from the general surface. (90)

As "almost an albino, six feet high, and broad, with a pink and white face and red eyes" (79), he tries chemical experiments to avoid people's attention. Like Dr. Jekyll, Dr. Moreau, and Frankenstein, Griffin is a scientist, a scientist of chemistry, and he is determined to use science to ensure that his white complexion caused by congenital albinism may disappear by making his body invisible. After three years of secrecy and exasperation in his experiment, he happens to find the method to turn things transparent:

One could make an animal--a tissue-- transparent! One could make it invisible! All except the pigments. I could be invisible!' I said, suddenly realising what it meant to be an albino with such knowledge. . . . 'I

could be invisible!" I repeated. To do such a thing would be to transcend magic. And I beheld, unclouded by doubt, a magnificent vision of all that invisibility might mean to a man,--the mystery, the power, the freedom. Drawbacks I saw none. . . . Three years I had of it-- And after three years of secrecy and exasperation, I found that to complete it was impossible,--impossible (92-93). . . . the essential phase was to place the transparent object whose refractive index was to be lowered between two radiating centres of a sort of ethereal vibration, of which I will tell you more fully later. . . I could scarcely believe I had done it. I put my hand into the emptiness, and there was the thing as solid as ever. I felt it awkwardly, and threw it on the floor. I had a little trouble finding it again. (95)

Finally he invents a method of making things invisible, applies the theory to himself, and he finds himself invisible. However, when he, in a desperately difficult situation, confesses this fact to Doctor Kemp, he responds with a few embarrassed words: "I am confused," "My brain is rioting. What has this to do with Griffin?" "It's horrible," and "But what devilry must happen to make a man invisible?" Griffin tries to persuade him that "It's no devilry. It's a process, sane and intelligible enough--" (79). However, even Dr. Kemp, who Griffith would like to rely on for his safety and experiment, does not trust him and unexpectedly betrays him. Just as those who see Frankenstein's monster never understand who he is, so in *The Invisible Man* "the villagers gain no information about who he might be, so they decide to try an

“inductive approach” by attempting to gather information in order to determine the stranger’s identity and situation” (Sibrabian 389). Eventually, like Frankenstein, he feels like an abandoned outcast as the character Sibrabian elaborates: “This betrayal also leaves Griffin alone, completely isolated from society. Angry, tired, and frustrated, Griffin realizes that there will be no place in society from him” (396). In this regard, Rachel Bowser says in “Visibility, Interiority, and Temporality in the *Invisible Man*” that “Griffin, who cannot communicate or reveal his identity to the Iping community, remains estranged from that community to the point of violent antagonism” (32). He cannot but resort to his invisible force and commit a series of crimes to survive, so that he is regarded as a cruel and brutal criminal. While being unaware of it, he soon finds himself becoming someone of a different identity whose invisibility is the only means by which he can survive. Ultimately, after his declaration of a “Reign of Terror,” Griffin is hunted down and beaten to death by an angry mob. That is, unlike the original intention of his hide-away, he brings danger to the villagers to ensure his own survival and is killed in the end.

In those literary works, it is revealed that those scientifically born or made hybrid creatures as Frankenstein’s monster, Hyde, and the invisible Griffin, suffer pain and agony when they come to realize their own split identity. This problem is often incurred by bodily change that occurs through biological and physiological technology which is acquired through chemical and scientific experiments. Consequently, the change has produced a new identity consisting of different ontologies and epistemologies.

In Wells’ *The War of Worlds*, the identity of mankind itself also undergoes an

agonizing ontological shift when they are invaded by Martians. The Martians look like octopi and have four feet, V-shaped two eyes in the middle, beak like lips and have tentacles on both sides of the mouth. As shown in the passage below, their evolution includes bigger heads while other body parts degenerate:

The internal anatomy . . . as dissection has since shown, was almost equally simple. The greater part of the structure was the brain, sending enormous nerves to the eyes, ear, and tactile tentacles. Besides this were the bulky lungs, into which the mouth opened, and the heart and its vessels. The pulmonary distress caused by the denser atmosphere and greater gravitational attraction was only too evident in the convulsive movements of the outer skin. (125)

As shown by their amputation, the bodily anatomy is the same and of simple construction. The biggest part of the structure is the brain that sends out huge part of sensory system to eyes, ears and tentacle organs. Moreover, there are many lungs connected to mouth, heart and arteries. Pressure inside the lungs due to high density air and great gravity are clearly apparent by the outer skin's vibrating movement. Wells includes the evolutionary message that "the strange horror of appearance" (21) of the creature anticipates what future humans will look like. This is confirmed by Wells when he argues that the Martians acquired their form based on "the tendency of natural selection" (127). The emergence of this possible evolutionary future for mankind is occasioned by the very degradation of man in his current form. Wells recalls how man has been degraded into a weak and nasty being like animal, "this spoilt child of life"

(131) who can “face neither God nor man” (132). The appearance of the Martian isolates man from both his religious self and his societal relations resulting in the fall of society into a chaotic and anarchic state. London becomes paralyzed while human identity experiences a devolution of scale. This is conveyed through the main character who confesses, “I was no longer a master, but an animal among the animals, under the Martian heel” (144).

All of these works show how the development of science dissolves and nullifies the boundary between human, machine, animal and other living organisms. A new human identity, as conceived by Victorian fiction, is revealed, one which has gone through internal splits, dispersion and new formations repeatedly. This is exemplified by the Martians who “may be descended from beings not unlike ourselves, by a gradual development of brain and hands . . . at the expense of the rest of the body” (127). Therefore, the Martians make rational decisions to carry on actions by thought rather than by emotion. Unlike humans who have emotional functions, it is an organism only with functional intelligence, like a cyborg of mass information.

#### **A Hybrid of Nature and Science: Frankenstein’s Monster and the Sublime**

As well as being a hybrid of human and animal, Frankenstein’s monster is also a good example of a hybrid creation of nature and science because he is created out of forsaken natural resources through scientific methods. As can be seen in ‘Natural Science,’ the blending of the two different words is possible because of the interrelation of the two terms. Natural science means the science of researching nature. Science is an academic discipline that explores nature, and nature is the object



expected to reveal its essence in the scientific laboratory. Although nature and science are totally heterogeneous concepts, they become homogeneous when they are used as one concept in the unified term of 'natural science.' As science is impossible without nature, the two have simultaneously the quality of homogeneity and heterogeneity.

Interestingly, Mary Shelley's *Frankenstein* shows how nature and science function and what result they produce when they are blended into an animated character, whether it is called animal, creature, or monster in her work. For the creation of her hybrid character, Shelley read many books and was interested in the popular trends in science prevalent in her times. She was also influenced by Percy Bysshe Shelley who "became fascinated with major scientific topics of the day, the solar system, microscopy, magnetism, and electricity" (Butler xv), and she was close, in particular, with his friend William Lawrence, doctor and scientist. Lawrence's radical scientific theory is reflected in this novel. As she confesses in the preface of the novel, she was also influenced by Erasmus Darwin and German physiologists:

The event on which this fiction is founded has been supposed, by Dr. Darwin, and some of the physiological writers of Germany, as not of impossible occurrence. I shall not be supposed as according the remotest degree of serious faith to such an imagination; yet, in assuming it as the basis of a work of fancy, I have not considered myself as merely weaving a series of supernatural terrors. The event on which the interest of the story depends is exempt from the disadvantages of a mere tale of spectres or enchantment. It was

recommended by the novelty of the situations which it develops; and, however impossible as a physical fact, affords a point of view to the imagination for the delineating of human passions more comprehensive and commanding than any which the ordinary relations of existing events can yield. ( 3)

Shelley says that even though the event in the story looks impossible, the monstrous creature can be highlighted as the realized creature of the imagination. In terms of Gilles Deleuze's concept, it is through science that the monster in *Frankenstein* is a result of the realization/actualization of what is ideally virtualized within nature.

[T]he virtual is not opposed to the real; it possesses a full reality by itself. The process it undergoes is that of actualization. . . . The virtual, by contrast, is the characteristic state of Ideas; it is on the basis of its reality that existence is produced, in accordance with a time and a space immanent in the Idea. Secondly, the possible and the virtual are further distinguished by the fact that one refers to the form of identity in the concept, whereas the other designates a pure multiplicity in the idea which radically excludes the identical a prior condition. Finally, to the extent that the possible is open to 'realisation', it is understood as an image of the real, while the real is supposed to resemble the possible. . . . The actualisation of the virtual, on the contrary, always takes place by difference, divergence or differentiation. . . . actualization or

differentiation is always a genuine creation. (*Difference and Repetition* 211-12)

According to Deleuze, it is Frankenstein's realized creature that is produced through the scientific actualizing process of the virtual which potentially exists as possible materials in the nature. Accordingly, Frankenstein's creating process and the subsequent events reveal not only the competition between humans and monster and between nature and science, but also the eventual realization of what is virtualized as the possible immanent in nature of the Idea. The phenomena can be expressed as the ecology of virtuality that explains the circulative virtualization process which can be noticed in nature. In other words, Frankenstein is an actual executor of virtual science who experiments with nature, whereas the monster is the realized nature itself which is both an object and a consequence of the scientific experimentation.

As a young scientist, Frankenstein hopes to make a great contribution to humans' prosperity. The desire of a scientist is certainly revealed through his conversation with sailors and a captain called Walton whom he meets pursuing the monster far to the North Pole. Walton's ambition is to sail and reach the North Pole in which "the wondrous power which attracts the needle" exists and "a thousand celestial observations" may be regulated (Shelley 6). Despite many difficulties, he is determined to reach there. On the other hand, the sailors who insist on going back home due to a long and hard voyage become dissatisfied and plan a mutiny. It is at this moment that Frankenstein elucidates the meaning and importance of the navigation to the sailors. He persuades the sailors to support the captain's voyage to the North Pole

by emphasizing their altruistic, civilizing role:

For this was it a glorious, for this was it an honourable undertaking. You were hereafter to be hailed as the benefactors of your species; your names adored as belonging to brave men who encountered death for honour and the benefit of mankind. And now, behold, with the first imagination of danger, or, if you will, the first mighty and terrific trial of your courage, you shrink away, and are content to be handed down as men who had not strength enough to endure cold and peril; and so, poor souls, they were chilly and returned to their warm firesides. Why that requires not this preparation; ye need not have come thus far, and dragged your captain to the shame of a defeat, merely to prove yourselves cowards. Oh! be men, or be more than men. Be steady to your purposes and firm as a rock. This ice is not made of such stuff as your hearts may be; it is mutable and cannot withstand you if you say that it shall not. Do not return to your families with the stigma of disgrace marked on your brows. Return as heroes who have fought and conquered, and who know not what it is to turn their backs on the foe.

(183)

Furthering this appeal, Frankenstein emphasizes his own previous desires as a scientist. He recalls reading books by Cornelius Agrippa, Paracelsus, and Albertus Magnus, desiring to find the philosopher's stone and the accompanying elixir of life. When he becomes a young man of seventeen he moves to the University of Ingolstadt

and comes to know new modern sciences like chemistry through M. Waldman and M. Krempe. Through many trials and errors in scientific studies and experiments, he excels even other scholars and professors in the University. In particular, he develops an interest in “the structure of humane frame” (33). This reflects Frankenstein’s vigorous curiosity to explore “the principle of life” and “the causes of life” (33). His attitude towards research and experiment is analogized from M. Waldman’s comment about the method used by modern scientists in exploring nature:

But the philosophers, whose hands seem only to dabble in dirt, and their eyes to pore over the microscope or the crucible, have indeed performed miracles. They penetrate into the recesses of nature and show how she works in her hiding-places. They ascend into the heavens; they have discovered how the blood circulates, and the nature of the air we breathe. They have acquired new and almost unlimited powers; they can command the thunders of heaven, mimic the earthquakes, and even mock the invisible world with its own shadows.

(30-31)

The quasi-divine authority afforded scientists motivates Frankenstein to obtain the knowledge of the principles of life and causes of life. In particular, for this purpose, he experiments with the dead bodies of animals and humans. Frankenstein fulfills Waldman’s observations by observing nature and then applying science. He gets an intuition about electricity by noticing a thunderbolt striking a big tree, creating a “spark of being” (38), and then proceeds to animate the creature by applying the

Galvanian theory of putting electricity through the body. However, the synthesis of nature and science produces repulsion rather than revelation. Frankenstein runs away from the creature after he saw its figure because he felt the utmost disgust towards its deformed and ugly figure. As such, Shelley is intimating an anxiety about this synthesis. Although his movement into the human world was enabled by science, the creature's strength and rage still indicate the power of nature intact.

This point can be made more opaque by drawing upon the sublimity of Mont Blanc, a symbolic representative of nature. The huge white snow-capped mountain, Mont-Blanc, bears enormous power as Shelley's husband, Percy Bysshe Shelley, suggests in his poem "Mont Blanc":

The secret Strength of things  
Which governs thought, and to the infinite dome  
Of Heaven is as a law, inhabits thee!  
And what were thou, and earth, and stars, and sea,  
If to the human mind's imaginings  
Silence and solitude were vacancy? (V, 139-44)

The Mont Blanc that Frankenstein watched exemplifies that wonder. The awe that he felt watching the white top of the miraculous mountain comes out from a sense of sublimity beyond a feeling of beauty. Nature is represented as an aesthetic being that is simultaneously godlike and zen-like. What is significant here is that it is nature rather than science that offers everlasting wonders and a sense of the divine. Frankenstein finds himself a discontented human in front of nature, watching Mont-

Blanc, aware only of his comparative passions:

I remained two days at Lausanne, in this painful state of mind. I contemplated the lake: the waters were placid; all around was calm; and the snowy mountains, "the palaces of nature," were not changed. By degrees the calm and heavenly scene restored me, and I continued my journey towards Geneva. . . . I discovered more distinctly the black sides of Jura, and the bright summit of Mont Blanc. I wept like a child. "Dear mountains! my own beautiful lake! how do you welcome your wanderer? Your summits are clear; the sky and lake are blue and placid. Is this to prognosticate peace, or to mock at my unhappiness? (55-56)

Mont-Blanc's snow-capped peaks are portrayed as 'the palaces of nature,' and acknowledged as a representative symbol of a tremendous nature of wonder. Such a heavenly scene of nature has a mysterious power to heal human mind or spirit. Weeping with overflowing emotion of happiness before Mont-Blanc, Frankenstein directly delivers his state of mind. The problem however, as P. B. Shelley's poem indicates, is the difficulty of accessibility: "Power dwells apart in its tranquility, / Remote, serene, and inaccessible" (Shelley IV, 96-97). Because sublimity in nature is aloof and difficult to revisit or find, scientists like Frankenstein seek to relocate the sublime onto the plateau of humanity and make it accessible to all. As a result, science acquires the divinity once invested solely in nature and tries to recreate it in the lab.

However, what results from these two kinds of sublimity? Generally speaking, balance and beauty, and imbalance and ugliness are important contrasting qualities in

the novel. If the formers represent the positive sublime which can be felt in the white and huge Mont-Blanc, the latter ones imply the destructive sublime of horrible terror and fear of death that can be sensed from the awe-struck deformity of the gigantic monster. In his chapter "Of the Sublime" in *The Sublime and the Beautiful* (1757), Edmund Burke highlights the relation between 'a source of the *sublime*' and 'pain and danger' or 'terror' as follows:

Whatever is fitted in any sort to excite the ideas of pain and danger, that is to say, whatever is in any sort terrible, or is conversant about terrible objects, or operates in a manner analogous to terror, is a source of the *sublime*; that is, it is productive of the strongest emotion which the mind is capable of feeling. I say the strongest emotion, because I am satisfied the ideas of pain are much more powerful than those which enter on the part of pleasure. Without all doubt, the torments which we may be made to suffer are much greater in their effect on the body and mind, than any pleasure which the most learned voluptuary could suggest, or than the liveliest imagination, and the most sound and exquisitely sensible body, could enjoy. (34)

And Burke adds that the tormenting feelings like pain and terror can produce 'the strongest emotion which the mind is capable of feeling' and that the feelings are more powerful in how they effect to the human body and mind than pleasure or 'the liveliest imagination.' In particular, Burke points out in the chapter of "Terror" that a strong feeling of 'fear' obstructs the mind's 'powers of acting and reasoning':



No passion so effectually robs the mind of all its powers of acting and reasoning as *fear*. For fear being an apprehension of pain or death, it operates in a manner that resembles actual pain. Whatever therefore is terrible, with regard to sight, is sublime too, whether this cause of terror be endued with greatness of dimensions or not; for it is impossible to look on anything as trifling, or contemptible, that may be dangerous. There are many animals, who though far from being large, are yet capable of raising ideas of the sublime, because they are considered as objects of terror. As serpents and poisonous animals of almost all kinds. And to things of great dimensions, if we annex an adventitious idea of terror, they become without comparison greater. A level plain of a vast extent on land, is certainly no mean idea; the prospect of such a plain may be as extensive as a prospect of the ocean: but can it ever fill the mind with anything so great as the ocean itself? This is owing to several causes; but it is owing to none more than this, that the ocean is an object of no small terror. Indeed, terror is in all cases whatsoever, either more openly or latently, the ruling principle of the sublime. (54-55)

When Burke says that ‘There are many animals who. . . are yet capable of raising ideas of the sublime, because they are considered as objects of terror,’ the monster comes to mind as one who represents the destructive sublime implicated in nature. It symbolizes cruelty, destructiveness, and violence hidden behind a seemingly positive nature. It is the gigantic monster who has a “ghastly and distorted shape”

(172), whose “colour and apparent texture [is] like that of a mummy,” so that the end result is “such loathsome, yet appalling hideousness.” As the monster is featured to evoke hatred and terror because of its terrible deformity and ugliness, all of the expressions listed above are designed to externalize the identity of the monstrous deformed creature.

Even though the monster is negatively described, interestingly, the monster exercises supernatural intelligence and physical ability, and he has overwhelming speed, velocity, power, and physique far excelling humans. Nevertheless, whenever the monster meets some people, he is conscious of the problems of his external features since observers are astonished, and curse, hit, and run away from him. In particular, carefully observing DeLacy’s family members, he comes to realize that he looks like a wretched and devilish monster:

I had admired the perfect forms of my cottagers - their grace, beauty, and the delicate complexions: but how was I terrified, when I viewed myself in a transparent pool! At first I started back, unable to believe that it was indeed I who was reflected in the mirror; and when I became fully convinced that I was in reality the monster that I am, I was filled with the bitterest sensations of despondence and mortification. Alas! I did not yet entirely know the fatal effects of this miserable deformity.

(90)

Ultimately, it is when he looks at his figure reflected in the water pool that he really recognizes that he is a demon different from humans. Feared by his deformed

body, he feels disgrace and despair. He becomes momentarily an object of terror and death to those who see him. When the monster starts to move after Frankenstein has created it, the emotion he feels from the monster's ugliness is disgust and hatred. It is as if the repugnance of the monster came from the destructive sublime that Burke realizes derives not only from the aloof beauty of Mont Blanc but from the imbalanced and disordered violence to destroy society and from the extreme sense of terror evoked from the violence. Burke suggests the implication of 'ugliness' in the chapter of "Ugliness" as follows:

It may perhaps appear like a sort of repetition of what we have before said, to insist here upon the nature of *ugliness*; as I imagine it to be in all respects the opposite to those qualities which we have laid down for the constituents of beauty. But though ugliness be the opposite to beauty, it is not the opposite to proportion and fitness. For it is possible that a thing may be very ugly with any proportions, and with a perfect fitness to any uses. Ugliness I imagine likewise to be consistent enough with an idea of the sublime. But I would by no means insinuate that ugliness of itself is a sublime idea, unless united with such qualities as excite a strong terror. (125)

Burke clarifies that 'ugliness of itself is a sublime idea.' As the monster's deformity and ugliness evokes a feeling of terror and fear beyond surprise from Frankenstein himself, so do they shock William, Frankenstein's pure and innocent brother, and the seemingly friendly and welcoming DeLacy's family. When the

monster saw William, Frankenstein's young brother, without knowing who he is, the creature thought that the young boy "was unprejudiced, and had lived too short a time to have imbibed a horror of deformity," that he could educate the boy to make him as his companion and friend, and so that he should not be so desolate in this peopled world (116-17). However, the boy's response is quite different: he cried; "monster! Ugly wretch! You wish to eat me, and tear me to pieces – You are an ogre – Let me go, or I will tell my papa. . . . Hideous monster! Let me go; My papa is a Syndic – he is M. Frankenstein – he would punish you. You dare not keep me" (117). The moment the monster heard the name of Frankenstein, he "grasped his throat to silence him, and in a moment he lay dead at" his feet (117).

The monster's deformed and ugly figure also shocks Delacy's family, in particular, Agatha who faints and Safie who runs out of the home. The moment that DeLacy's other family members come into the cottage and see the monster sitting next to the father, they express "horror and consternation" (110) because of the destructive nature of the sublime that his gigantic deformed physique and his disgusting and ugly feature imply. By comparing Kant's aesthetic theory and monstrosity in *Frankenstein*, Barbara Freeman reflects on the sublimity in "Frankenstein with Kant: A Theory of Monstrosity, or the Monstrosity of Theory" as follows:

*Frankenstein* can be read almost as a parody of the *Critique of Judgment*, for in it everything Kant identifies with or as sublime, including the products of sublimation, yield precisely what Kant prohibits: terror, monstrosity, passion, and fanaticism. All the things

Kant's sublime is supposed to be and do -- for example, "raise the energies of the soul above their accustomed height" . . . and produce a conviction of the mind's "superiority to nature even in its immensity" . . . . -- the vision of the sublime in *Frankenstein* systematically inverts. . . . Each time a sublime landscape is depicted, it is linked to the Monster's appearance. Indeed, after the Monster's birth at Ingolstadt, Victor's meetings with him take place only at the tops of mountains, on glaciers surrounded by fields of ice, or during violent storms, amidst echoing thunder and repeated, dazzling flashes of lightning. The landscape is the same as Kant's -- that of Nature in all her might and majesty, but the effect (and affect) produced is not. (23-24)

How could we compare the two different aspects, the sublime in Mon Blanc and the sublime in Frankenstein's monster? As Barbara suggests, 'the vision of the sublime in *Frankenstein* systematically inverts' all the things Kant's sublime is supposed to be and do, that is, subverts traditional concept of the sublime out of a striking landscape, which is something grand and immense. The monster's loathsome, appalling and hideous deformity evokes not only a sense of terror and hatred, but also eventually causes the death of his loved family and friends such as William, Justine, a home servant, Clerval, his best friend, and Elizabeth, his wife.

Even the appearance of the monster makes the peaceful and calm society fall into a state of chaotic turbulence. The realization of the virtual sublime and power is apparently made by the unexpected result of Frankenstein's confluence of science and

nature. As if the advent of the monster causes unprepared people to die, the strong advent of natural science in the nineteenth century society began to shock people into hating science for its sublime power and its inestimable potential.

Burke's definition of the sublime allows for the monster's existence as well as the effects of onlookers aghast at his form. However, Shelley's point is to also show that the monster is a hybrid, a product of science as well as nature. Its creation enables the possibility of endangering human life along with the implication that further experimentation might continuously threaten society. In other words, a scientific misuse of the power inherent in nature could bring on an uncontrollable disaster. For example, Albert Einstein's relative theory resulted in manufacturing of nuclear bombs, modern hi-tech weapons, and medical cloning of creatures, all of which are just scientific application of natural phenomena. Unfortunately, however, the productions potentially endanger humans and their identity. In this context, the statement of the seventeenth century essayist Francis Bacon, quoted by Anne Mellor, is interesting:

When Francis Bacon announced, "I am come in very truth leading to you Nature with all her children to bind her to your service and make her your slave," he identified the pursuit of modern science with a form of sexual politics: the aggressive, virile male scientist legitimately captures and enslaves a passive, fertile female nature. (287)

To Bacon, nature is an object for scientific experiment, and a servant of science. He compares science to a man who will conquer and enslave female nature. In other words, he considers the relation between science and nature as that between

master and servant. In this regard, Mellor offers an interesting interpretation of Frankenstein's creation of the monster. Mellor regards Frankenstein's monster as a surplus of male science, that is, a destructive symbol, to exploit and destroy the nature of a female principle. In particular, Mellor points out an ellipsis of the evolutionary stage in the creation of the creature as the monster is not a result of sexual reproduction, but a paternal reproductive process. Accordingly, she indicates that this literary work shows science's destructive intentions against nature:

Significantly, in his attempt to create a new species, Victor Frankenstein substitutes solitary paternal propagation for sexual reproduction. He thus reverses the evolutionary ladder described by Darwin. And he engages in a notion of science that Mary Shelley deplores, the idea that science should manipulate and control rather than describe and understand nature. (298)

According to Mellor, Mary Shelley expresses her concern about the superintending role of science as a master. Mellor also asserts that the attempt to make artificially a new creature with natural organic materials militates against the rhythm of nature by invoking a machoistic unilateral exploitation of nature. Mellor argues that Mary Shelley strongly opposes Frankenstein's experiment and takes revenge upon it. The revenge is made by creating the isolated monster, an object of the experiment itself while the monster is still a result of nature exploited and a part of nature. In other words, a monster of nature takes its revenge upon the science of a machoistic world.

In this context, Mary Shelley resolves the relation of Frankenstein and the

monster to that of master and slave in the text. In the first part of *Frankenstein*, the relationship of the scientist and the monster is that of creator and creature, ruler and the ruled, as it were, that of master and slave, but in the last part of the text, interestingly, the relationship reverses, so the monster develops as the master and Frankenstein as the slave:

Begone! I do break my promise; never will I create another like yourself; equal in deformity and wickedness." "Slave, I before reasoned with you, but you have proved yourself unworthy of my condescension. Remember that I have power; you believe yourself miserable, but I can make you so wretched that the light of day will be hateful to you. You are my creator, but I am your master; --obey! (140)

Requested by the monster to make a female monster, as can be seen in the above quoted passage, when Frankenstein suddenly destroys the almost completed female, the monster claims to him, who did not keep the promise, that 'You are my creator, but I am your master; -- obey!' The relationship between the two continues, chasing and being chased all the way to the North Pole, and in this situation, the monster often drops a dead hare for exhausted Frankenstein, leaves a trace to him who gets lost, and entices him to the deep north of the natural world. The monster now grows relatively superior to Frankenstein as "the dominant partner" (Butler 317). Furthermore, the reversed relation becomes associated even with that of strong master and truthful slave because Frankenstein's life seems very much preserved and directed by the extent to which the monster will accord him tenderly care.



However, this relation of love and hatred between them is eventually resolved when they move deep into the North Pole. Under a dangerous situation, losing the track of the monster, Frankenstein is found and saved by Walton's sailors, and at the last moment before death he confesses to Walton a vanity of scientific discovery and invention. He advises him to give up the ambition of science and discovery, declaring that his innocent but dangerous scientific ambition has driven him to utter despair and dejection:

Farewell, Walton! Seek happiness in tranquility, and avoid ambition, even if it be only the apparently innocent one of distinguishing yourself in science and discoveries. Yet why do I say this? I have myself been blasted in these hopes, yet another may succeed. (186)

What is symbolized by this ultimate self-realization of Frankenstein's is that when science is developed to control and exploit nature, fear and disaster can be brought out by nature, despite being ruled by science. The essential thing is that the result of the scientific experiment sought by Frankenstein turns out to return a symbolic nature, the monster, to its origins. After Frankenstein dies deploring his excessive desire, the monster regresses to the natural environment of the North Pole. As Butler puts it, the monster "goes to it voluntarily, with a consoling sense that even he now returns to nature" (317). The monster is not the creature composed by Frankenstein any more, but a part of nature as it used to be before it was recreated. Now the monster reveals his plan that he will stop his revenge against the world of human science and regress to the world of nature forever:

Fear not that I shall be the instrument of future mischief. My work is nearly complete. Neither yours and any man's death is needed to consummate the series of my being, and accomplish that which must be done; but it requires my own. Do not think that I shall be slow to perform this sacrifice. . . . I shall collect my funeral pile, and consume to ashes this miserable frame, that its remains may afford no light to any curious and unhallowed wretch, who would create such another as I have been. I shall die. (190)

Stating that he has almost finished his work, the monster pledges that he will not conduct destructive and violent acts. The completion of his work is made by offering himself as the true burnt offering to pay for his misbehaviors. Although he is a creature created by science, he is willing to undertake voluntary self-punishment for the crimes that he has committed. However, the crimes are all caused by the senseless and irresponsible scientist and the side-effect of science. The monster is neither a perfect human nor a perfect nature, but he straddles the line between science and nature. Eventually, his death returns him completely to nature, away from the conflict between science and nature, and so he dies as un-reconstituted nature, the thing itself.

The monster is a fictional character created amidst a social, cultural, and scientific milieu. He has common features that human, nature, and science share, and he holds an intermediary function as a linkage-entity between human and nature or between science and nature, straddling the two as in-between of 'nature-becoming' and 'human-becoming.' Likewise, the monster exists beyond the binary system between

science and nature. However, it is evident that the in-between cannot co-exist nor can the two kinds of sublimity. At the end, Shelley's point is that the idea of hybridity fades when Frankenstein and the monster die away and that science and nature are not the familiar bedfellows that Frankenstein wanted them to be.

## CHAPTER 4

### THE CHALLENGES AND DISCOMFORTS OF HYBRID POPULAR SCIENCE: FICTIONAL REPRESENTATIONS OF MAD SCIENTISTS AND THE LABORATORY

As the works and theories of the scientists such as Charles Darwin were published and popularized for the general public by his fellow scientists and scholars, the conservatives referred to this accolade as an example of ‘popular science,’ which was deemed to be a discourse of hybridization couched in a discourse populated by atheistic and eccentric ideas and theories by ‘mad’ scientists, reflected in the novels *Frankenstein* and *The Island of Dr Moreau*. The controversy certainly created an anti-popular science sentiment because conservatives regarded this kind of science as “a threat to the religious and social order” (B. Lightman 9). Accordingly, this chapter will review how the perception of the ‘mad’ scientist’s hybrid science directly affected the way that the Victorian people had assigned value to the traditional culture, religion and conventions.

#### **The Madness and Ambition of Scientists**

The presence of Frankenstein, as a scientist making unprecedented scientific discoveries and engaging in technological revolutions, attracted much attention from the general public as well as from the literary authors who projected these scientific advances into science fictions. However, the fictional scientists such as Frankenstein were often depicted as insane people who opposed social traditions and God's will. This was probably because the field of science was not an important subject in prestigious universities such as Oxford or Cambridge at the time, and therefore

considered as an area more suited to the passionate pursuits of independent amateurs. Also the laboratories were often dark and desolate, leaving behind the image of the anti-social scientist who worked in isolation and who raised suspicion about his experimentation. Though these scientific experiments were executed throughout many areas in Europe, they were not publicly known. Thus, the public knew little about the scientists' abilities and sometimes because of the uncommon choice of work, some of them were called 'mad scientists.'

Haynes classifies scientists into six different classes in the introduction of *From Faustus to Strangelove*: the alchemist, who reappears at critical times as the obsessed or maniacal scientist: the stupid virtuoso, out of touch with the real world of social intercourse: the Romantic depiction of the unfeeling scientist who has reneged on human relationships and suppressed all human affections in the cause of science: the heroic adventurer in the physical or the intellectual world: the helpless scientist: the scientist as idealist (3-4). As described by the classifications, all of these scientists are described as socially unfit. Haynes views these scientists in the same category as the character Faustus who dreams of unreal desires. The same viewpoint extends to Frankenstein, Dr. Jekyll, and Dr. Moreau. Their research seems to overreach the boundaries of human limits with no consideration for religious faith or bioethics. Because they conduct their work in secret, separating themselves from society itself, they are regarded by the public as strange and insane scientists. For example, Frankenstein considers the church simply as a morgue that stores bodies. He spent days and nights in the morgue studying the dead bodies through meticulous observations, trying to scrutinize the process of biological death and the minutia of

causation for life in order to create it himself.

Dr. Jekyll's scientific ambition was not so different from that of Frankenstein's. His objective was to create a transcendental medicine that could permanently separate good and evil within the nature of men. Dr. Jekyll's curious and unique character can be grasped easily by the conversation between his friend Dr. Lanyon and his lawyer Mr. Utterson. When Utterson visited Lanyon in order to locate Dr. Jekyll's whereabouts, Lanyon states, "it is more than ten years since Henry Jekyll became too fanciful for me. He began to go wrong in the mind. . . . Such unscientific balderdash . . . would have estranged Damon and Pythias" (12). Because Jekyll was so obsessed with unscientific delusions, he even shows animosity towards his friends who "have denied the virtue of transcendental medicine" that he was trying to create (53). As a result he became socially ostracized. In addition, until he proved that his theory was right, he was ready to seclude himself in a part of his house, a laboratory whose "windows are always shut." It is unclear who exactly lives there. Lanyon says, "And then there is a chimney which is generally smoking; so somebody must live there. And it's not so sure; for the buildings are so packed together about that court, that it's hard to say where one ends and another begins" (9). This labyrinthine structure serves as a metaphor for the deliberate isolation in which the scientist places himself, unwilling to be easily found.

Dr. Moreau "was simply howled out of the country" due to his cruelty in his experiments. This was publicly announced when "a wretched dog, flayed and otherwise mutilated, escaped from Moreau's house." His cold-hearted and cruel methods of experimentation were revealed to the public by a prominent editor who

“appealed to the conscience of the nation.” Even the research assistant who helped Dr. Moreau's experiments thought that his methods were cruel, and helped his cousin, the editor, to obtain “access to his laboratory. Also, “his fellow-investigators” and “the great body of scientific workers” did not wish to help him with this problem (32).

As such, the scientists' discoveries and experiments were greatly undermined by the public who thought they were abnormal and insane. Interestingly, according to Stiles, " the Romantics saw genius as a mystical phenomenon beyond the reach of scientific investigation,” whereas “[r]ather than glorifying creative powers, Victorians pathologized genius and upheld the mediocre man as an evolutionary ideal” (126). Thus, the unique sign of genius that the scientists owned was considered to be a sort of mental illness at the time. A late nineteenth- century journalist John Ferguson Nisbet stated in *Insanity of Genius* that the sign of genius in the Victorian era was “nerve-disorder” that “runs in the blood” (325). In other words, signs of genius were considered to be “co-morbid with various types of mental illness” (Stiles 124), and, accordingly, geniuses were thought to be deficient of mental and ethical senses. It is in this context that scientists were considered to be mad and insane.

This attitude towards the scientists was partly based on a general attitude towards science. The Romanticists “focused on the limitations rather than the triumphs of science” (Haynes 75). They criticized science because of its "limiting the universe to the sum of separate, measurable entities. It limited man as well, denying the validity of emotions, nonrational experiences, spiritual longings, and individuality" (Haynes 75). Despite these statements, S. S. Schweber's insists that Romanticism affected scientific development positively, stating; "There is no better way to obtain an insight

into the Romantic values and inspiration of the early Victorian scientist than to read *Darwin's Diary of His Voyage On the Beagle*" (19). As romantic poets sought out invisible power of nature, so scientists tried to make the power discernible to the observers. To the romanticists, scientists may seem to deny the spiritual and organic relationship between the universe and nature, but in truth these scientists possess romantic ideas: even when they are studying in strange environments, they crave the desire to gain access to the infinite transcendental powers and abilities of nature itself.

From the religious era of the Middle Ages through the Renaissance period to the Industrial Revolution era when modern science started, there had been different kinds of ways to perceive the world of nature. In the sixteen-seventeenth centuries, Bacon, Descartes, and Newton employed their own reasoning theories to prove the laws and principles of nature. Nonetheless, their scientific viewpoints of the world could co-exist. In *Philosophical Concepts in Physics*, Cushing enlists "three types of warrants for the axioms and postulates from which we then deduce logically certain implications or predictions:"

- i axiomatic - Here axiom is claimed to be self-evident, obvious or immediate. . . . Aristotle often arrived at his cosmological principles in this fashion after a rather cursory examination of the data of experience. Descartes attempted to base the science of mechanics on such first principles seen to be true in their own right, once properly understood.
- ii inductive - Here generalizations are made from similarities perceived in a large group of particular events or observations. This is the method



proposed by Bacon and later espoused by Hume and by Mill.

iii retroductive – Here we go from consequences back to hypotheses as in the hypothetico-deductive method. (Cushing 34)

Assuming that “the bodies of animals could be described and understood as complex machines” and that “humans beings were no exception” (Haynes 74), Descartes developed his mechanical world view that a world moves like a clock under the influence of God. In the late sixteenth century, Bacon's world viewpoint that nature becomes a maid of science was given more weight. Rather than depending on Newtonic method, Baconic inductive way of thinking functioned more positivistically for the scientific experiments. In Aphorism XIX of Book I in his *Novum Organum*, Bacon writes:

There are and can be only two ways of searching into and discovering truth. The one flies from the senses and particulars to the most general axioms, and from these principles, the truth of which it takes for settled and immoveable, proceeds to judgment and to the discovery of middle axioms. And this way is now in fashion. The other derives axioms from the senses and particulars, rising by gradual and unbroken ascent, so that it arrives at the most general axioms last of all. This is the true way, but as yet untried. (Bacon IV [1901], 50)

In other words, Bacon made an appropriate general theory based on particular observation or data, and then verified the theory by comparing the facts and its predictions, and he repeated this process until he arrived at a universal axiom or theory

or principle. As the author of *Darwin Now and Then*,<sup>6</sup> Richard William Nelson addresses directly the relationship between Bacon and Darwin, who used inductive reasoning in writing *the Origin of Species*:

Bacon differentiated between “concepts” drawn from the “mind” and the “facts” drawn from the “evidence.” Concepts drawn from the mind can be influenced by prior knowledge, preconceived ideas, and traditions. Inductive reasoning limits the influence of bias. In dedication to the establishment of inductive reasoning, Bacon established the British Royal Society. Later in the nineteenth century, emphasis on the importance of inductive reasoning was further championed by William Whewell, a contemporary of Charles Darwin. To align with inductive reasoning, Darwin opens *The Origin of Species* with quotations from both Whewell and Bacon.<sup>7</sup>

After publishing of *The Origin of Species*, which is based upon Bacon's empirical scientific methodology, Darwin's theory of evolution became a catalyst with

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<sup>6</sup> In *Darwin, Then and Now: The Most Amazing Story in the History of Science* (2009), Nelson elaborates on “who Darwin was, what he said, and what scientists have discovered since the publication of *The Origin of Species*” in the historical context of science. Nelson is “a professional clinical pharmacologist, and associate clinical professor.” He manages his own blog at <http://www.darwinthenandnow.com/> where he posts various essays on Darwin and evolution.

<sup>7</sup> “Darwin and the Scientific Revolution,” Part 2, <http://www.darwinthenandnow.com/2009/07>

which to expand an entirely new scientific viewpoint of the world. By using Bacon's scientific methodology, Darwin's ground-breaking theory naturally came to implode a religious and transcendental viewpoint of the world and humanizes the universal principles through scientific method.

Thus, the modern scientists' experiments were considered to be the works of pagans and agnostics. Moreover the development of science and technology was seen to break down the pre-existing chain of being and replace it with a new academic, intellectual, epistemological, and ontological sphere. Because the scientists seemed to deny the traditional viewpoint of the world, conservative intellectuals and theologians came to oppose the scientists' subversive experiments. In other words, the scientists were criticized for their atheism and arrogance because their research overcame the boundaries of pre-existing traditional epistemology. Haynes states that even some of the most crucial eighteenth century literary writers indirectly criticized the lack of ethics of scientists:

[M]ajor literary figures, such as Alexander Pope, Jonathan Swift, Samuel Butler, and Samuel Johnson, became increasingly critical of the moral failings they saw as being engendered by the very success of the new science. First, resurrecting the Faustus image, they believed that scientists were attempting to discover more than it was proper for humanity to know. Second, they shared a barely supposed anger at what they saw as the arrogance of scientists, especially the proponents of Baconian method, with its assumption that eventually man will fully

understand and exploit the mysteries of the universe. Here, again, there are echoes of Faustus the overreacher, particularly in the implications of Bacon's dictum that knowledge is power. The third and essentially new component in the eighteenth-century criticism of scientists was the fear that science might indeed succeed in deriving a self-sufficient, purely mechanistic system, with no moral dimension and no need of God.

(66-67)

Frankenstein's mentor professor M. Waldman has been largely influenced by Bacon's scientific points of view. Therefore, he urges Frankenstein to escape from narrow-minded view of Newton's mechanism and grasp a wider view of modern science, and he also advises Frankenstein to conduct his future studies as follows: "If your wish is to become really a man of science, and not merely a petty experimentalist, I should advise you to apply to every branch of natural philosophy, including mathematics" (31). In particular, he puts emphasis on chemistry "in which the greatest improvements have been and may be made" (31). However, the general response to the new science in the Victorian period was not so generous because it was thought that the new study would endanger the social and cultural order of the Victorian life. The reasons are well stated in Schummer's "Historical Roots of the "Mad Scientist Chemists in Nineteenth-century Literature":

[C]hemistry was the prototype of the experimental laboratory sciences that exploded in the nineteenth century and induced an ongoing fragmentation and specialisation of knowledge, which posed a serious

threat to any ideas of the unity of knowledge. On the other hand, literary representations of chemists could easily draw on the well-developed literary figure of the medieval “alchemists,” which was already loaded with moral, social, metaphysical and religious criticism.

(39)

According to Schummer, “the antimetaphysical attitude of the new chemistry,” “the lack of any reference to natural theology,” and “the establishment of (organic) chemical analysis as the basis of experimental research, all contributed to the metaphysical bias and the religious indignation by Christian authors” (62). Schummer’s comment is meant to point out that the scientists’ research in chemistry was questionably or critically targeted by Victorian writers and even the general Victorian public because their research was considered to be anti-religious and anti-theological. In addition, contemporaries were willing to look down upon the scientists as alchemists who already had been heavily criticized.

### **Mad Scientist and Laboratorial Environment**

In order to observe the progressive change represented by science, and to explore the Victorian image of scientists, the scientists' education needs to be specifically examined. Unlike information related to Dr. Jekyll or Dr. Moreau, scientific education in Frankenstein's childhood is relatively well described. By scrutinizing his background and the cause of his affection for science, the historical background of scientific studies in the Victorian era can be understood in a better context.

Thirteen year-old Frankenstein chanced to find a book written by Cornelius Agrippa in the inn while visiting the baths near Thonon, and became interested in "immortality and power" (29) while he "had a contempt for the uses of modern natural philosophy" (29).<sup>8</sup> Afterwards driven by personal passion, he found and read Albertus Magnus' and Paracelsus' texts and became obsessed with "the philosopher's stone and the elixir of life" (23). However, he came to realize the pivotal role of electricity by witnessing a lightning strike on an oak tree near his house. After this realization, he gave up "Cornelius Agrippa, Albertus Magnus, and Paracelsus who had so long reigned the lords of [his] imagination" (25) and decided to attend "a course of lectures upon natural philosophy" according to his father's wishes. Failing to attend most of the lectures due to "some accident," he only managed to listen to one of the last lectures, which was delivered by a professor about "the greatest fluency of potassium and boron, of sulphates and oxyds, terms to which "he could affix no idea" (25). Being unfamiliar with the new chemical terms, he could not understand the lecture and so

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<sup>8</sup> Cornelius Agrippa (1486–1535), "an author of *De Occulta Philosophia Libri Tre*" (1529), was a German cabalist, theologian, and alchemist. He regarded magic as physics, and a combination of philosophy and mathematics. Paracelsus's real name was Theophrastus von Hohenheim (1490-1451). He was a "Swiss doctor, chemist, and mystic, whose interest spanned medieval alchemy and early modern empirical medicine. Enlightenment historians of science recognized the contribution of Paracelsus's experimentalism and holism." Albertus Magnus (1193?–1280) was "Dominican theologian, Aristotelian, teacher, who studied plant life and the brain. He is associated with the device of a brazen head, illusion or mechanical device, that could answer questions." (Butler "Note" 254)

even “became disgusted with the science of natural philosophy” (25).

Finally at the age of seventeen, he came in contact with modern chemistry at the University of Ingolstadt. When he met Professor Waldman who focused on the importance of the newly emerging science of chemistry, he realized the potential and revolutionary ideas of this new science. These kinds of experiences of Frankenstein’s may have reflected the fresh revolutionary ideas of modern science envisioned by many scientists in the early nineteenth century.

Right in the center of these scientific revolutions stood the mad scientists such as Frankenstein, Dr. Jekyll, and Dr. Moreau. The scientists were often considered as "at best eccentric and faintly comic, often alien, often somehow "unsound," and frequently positively evil" (Millhauser 288). Another reason that scientists were considered abnormal was because of “the isolationism of scientists" (Haynes 157), which would result in a poor working environment. These sorts of isolated and grim spaces might tend to leave a negative impression of scientists. The secret and dark laboratory, as in "Jekyll's statement on the case" of *Dr. Jekyll and Mr. Hyde*, is metaphorized as "the prisonhouse of [their] disposition" (59). In this regard, laboratories act as "the agonized womb of consciousness" (56) where conflicting emotions such as pleasure, desire, reason and remorse reside like the human mind where good and evil coexist. Dr. Jekyll's laboratory was also known once as "a celebrated surgeon's dissecting rooms" (26). His room is always dark because it is designed to only allow a small ray of light from the ceiling. From the street view, the laboratory is located on the second floor of the building, which has "no window, nothing but a door on the lower storey and a blind forehead of discoloured wall on the

upper . . . . The door which was equipped with neither bell nor knocker, was blistered and distained" (6). If one wants to reach the laboratory from the inside, he needs to go across the rooms of the kitchen through the garden. This is because the laboratory itself is independent of the building itself. The approach to the laboratory is not allowed to anyone except for Jekyll. The lab inside is messy: "the tables laden with chemical apparatus, the floor strewn with crates and littered with packing straw, and the light falling dimly through the foggy cupola" (26), all of which make the lab look dreary and grim.

To Frankenstein, "his lonely apartment" (28) is his laboratory. He was so engrossed in his research that he could state, "that application . . . now became so ardent and eager, that the star often disappeared in the light of morning while I was yet engaged in my laboratory" (32). His choice of a working space "on one of the remotest of the Orkneys", a remote Scottish island, is a kind of hut whose thatch had fallen in, whose walls were unplastered, and whose "door was off its hinges." This place is good for his toil because he can work "ungazed at and unmolested" (136). The same goes with Dr. Moreau whose laboratory is an isolated island on which half-human half-animals are created and reared. The cruel biological experiments are conducted in a secretive space called 'the House of Pain' in which Dr. Moreau creates half-human, half-animal creatures. Access to the lab is also prohibited. To reach the lab, one has to pass "the darker corner of the room" with "a small unglazed window, defended by an iron bar" and "the paved courtyard" (30). Even Moreau only leaves "the room by the outer door, as if to avoid opening the inner one again" (30) because awful and disgraceful experiments in the inner lab are secretly carried out through vivisections



and surgeries that can transform various beasts into humans.

The creatures' habitat is the whole island, where they are totally secluded from the human world and where they are trained and disciplined to talk and behave like humans. As a matter of fact, the unnamed island itself is a great laboratory in which Moreau's consistent attempts have been made to change animal consciousness into the human consciousness and to adjust the humanized creatures to human society's rules and rituals.

The question then arises as to why their laboratories are so isolated and gloomy? The reason may be partly due to their strange individual personalities, but if the social, political and cultural contexts are closely examined, the reason becomes clear why Frankenstein, Dr. Jekyll, and Dr. Moreau's laboratories were so secluded from society and so poorly constructed. The scientists of the Victorian era were perceived poorly in terms of economic, social and political statuses. As social and cultural recognition of the importance of science was negligible, so scientists lacked external financial support and political cooperation. Thomas F. Gieryn elaborates on the reasons by quoting some dignitaries of scientific fields at that time: Charles Babbage who was a mathematician and inventor of the first mechanical computer, Norman Lockyer who was a scientist and astronomer and a founding editor of *Nature*, and T. H. Huxley who was an absolute supporter of Darwin's evolutionary theory:

Babbage finds neglect and decline in three parts of scientists' professional stake: opportunities for gainful employment, curricula for proper education in science, and authority in governmental

deliberations requiring exact knowledge of natural phenomena. . . .

Working conditions for scientists evidently did not improve much after Babbage's complaints, if one listens to these publicists. Norman Lockyer, the founding editor of *Nature*, remarked in 1873 that "there is absolutely no career for the student of science in this country. True scientific research is absolutely unencouraged and unpaid." A year later, Darwin's bulldog Thomas Henry Huxley complained that "no amount of proficiency in the biological sciences will 'surely be convertible into bread and cheese.'" Keeping to the culinary metaphor, Huxley later said: "Science in England does everything, --- but pay. You earn praise but not pudding." (38-39)

The citation shows the poor nature of the research environment for Victorian scientists. John Tyndall, who was the superintendent of the Royal Institution in London, spoke to "two impediments" against the development of science: "the enduring cultural authority of Victorian religion and the practical achievements of British engineering, mechanics, and manufacturing" (40). Equal to this negative attitude was the poor conditions of the labs, the lack of interest in them and the social ill-treatment of the scientists who worked in them. This is clearly indicated in René Vallery-Radot's *The Life of Pasteur*. Pasteur points out the poor condition of laboratories, the lack of social attention to science, and the importance of laboratories for social development:

Laboratories and discoveries are correlative terms; if you suppress laboratories, Physical Science will become stricken with barrenness and death; it will become mere powerless information instead of a science of progress and futurity; give it back its laboratories, and life, fecundity and power will reappear. Away from their laboratories, physicists and chemists are but disarmed soldiers on a battlefield. The deduction from these principles is evident: if the conquests useful to humanity touch your heart — if you remain confounded before the marvels of electric telegraphy, of anesthesia, of the daguerreotype and many other admirable discoveries — if you are jealous of the share your country may boast in these wonders — then, I implore you, take some interest in those sacred dwellings meaningly described as laboratories. Ask that they may be multiplied and completed. They are the temples of the future, of riches and of comfort. There humanity grows greater, better, stronger. (199-200)

Though Pasteur was a French bio-chemist, his claims about the laboratories represent what the environments of laboratories were like in other European countries such as England and Germany. As can be assumed from the statements above made by Babbage, Norman, Tyndall, and Pasteur, and as can be judged from the ill-favored circumstances of the laboratory and the status of the scientist as a member of an estranged and ignored minority, it can be understood why fictive scientists such as

Frankenstein, Dr. Jekyll, and Dr. Moreau did their research and experiments in the poorest of environments and conditions.

Despite the fact that these conditions were not favorable to their research and that their accidental discoveries and inventions in science did not fit with traditional social values, the scientists' works created a new paradigm in science. They discovered, as Thomas S. Kuhn states, "a conflict between the paradigm that disclosed anomaly and the one that later renders the anomaly law-like" (97). Viewed from this angle, the challenges facing Frankenstein, Dr. Jekyll, and Dr. Moreau required scientists to have a relentless persistence in order to fulfill their scientific ambition and revolution.

### **Scientific Ambition and Revolution in the Laboratories**

According to the Newtonian "mechanistic worldview that dominated science at the end of eighteenth century," God "created the universe as a perfect machine whose parts never wear out (conservation of matter) and which never runs down (conservation of motion)" (Brush 3). This worldview was based on the belief that "The motion of every particle of matter is completely determined by the state of the universe at any instant of time" as God "would know in complete detail the entire past and future" (4). Given this viewpoint of the world, new discoveries and inventions made "in the period 1500-1800 as a result of the work of Nicolaus Copernicus, Galileo Galilei, Descartes, Newton, and Antoine Lavoisier and others" (4) brought new scientific changes that represented a significant paradigm shift. Calling this change

scientific revolution,<sup>9</sup> Brush quotes Thomas Kuhn's definition of scientific revolution that "involves not only a radical change of specific theories and techniques but also a change in the kinds of questions that theories are expected to answer and the criteria for judging those answers" (5). As William Eamon explains in *Science and the Secrets of Nature*, such changes created two traditions that co-existed from the Early Modern era onwards:

The first, centered in the universities, was concerned primarily with preserving and perpetuating received doctrines. The disciplines making up the universities-based sciences - astronomy, optics, dynamics, and medicine - already existed as subjects of scientific investigation in antiquity and were the focus of continuing research throughout the Middle Ages. . . . the aim of experimentation in Baconian scientific tradition was entirely different from that in classical science. . . . the research fields emerged during the Renaissance. These included subjects such as chemistry, magnetism, electricity, and metallurgy. Although scattered empirical data existed concerning these subjects prior to the sixteenth century, in contrast to the classical sciences they did not inherit a coherent body theoretical doctrine. To the existence that they existed as fields of research prior to the Renaissance, they

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<sup>9</sup> On the other hand, Thomas Kuhn defines a "successful quantification of the Baconian sciences" as the second scientific revolution, different from what Brush has called the scientific revolution. (217, 1977)

were regarded merely as interesting classes of phenomena or as practical arts rather than as coherent scientific disciplines. (6-7)

The research purpose of modern science was completely different from that of classical science since the purpose of the modern experiment was to clearly visualize the facts that were known to the public differently from that of the first scientific tradition in which a non-positivistic Scholastic method was used. In other words, the experiment of "Baconian sciences" in the second tradition was to neutrally investigate nature and universe from scientific and objective points of views. The former tradition was intended to provide theoretical case studies for a limited, scholarly audience, whereas the latter depended on a wider variety of practical experiences. For example, William Gilbert's research on magnetic fields received more help from the real field experiences of actual navigators and tool manufacturers of the time than from the knowledge of natural philosophy in the Middle Ages. Similarly, Robert Boyle's chemical experiments were significantly helped by metallurgers, dyers, and distillation manufacturers. The development of these kinds of sciences was directly dependent upon various information that such professionals gained in the fields. In fact, actual experiments themselves were conducted with knowledge from the fields, independent of the scientists who operated only on the theoretical and academic level (8).

In *Frankenstein*, Robert Walton approaches the subject with thorough pragmatic ideas. He tries to discover "the secret of the magnet," also known as "the wondrous power which attracts the needle" (6). He also tries to discover a shorter navigation route to the North Pole in order to shorten the time of travel and contribute

to knowledge of the human race. In contrast to the Scholastic form of natural philosophy that put emphasis on the external parts of nature, that are inherently visible, the new natural philosophy considers "the secrets of nature" (Eamon 298) as a new subject of science. As professor Waldman states in *Frankenstein*, new scientists,

[W]hose hands seem only to dabble in dirt, and their eyes to pore over the microscope or crucible, have indeed performed miracles. They penetrate into the recess of nature, and shew how she works in her hiding places. They ascend into the heavens; they have discovered how the blood circulates, and the nature of the air we breathe. They have acquired new and almost unlimited powers; they can command the thunders of heaven, mimic the earthquake, and even mock the invisible world with its own shadows. (30-31)

Considering the detailed examples that Waldman gives of the change in scientific research, it is clear that Mary Shelley was very aware of the characteristics of the newly emerged natural philosophy.

It is interesting to compare Frankenstein's and Walton's scientific knowledge and concern. Frankenstein excels Walton in scientific knowledge. Walton is still obsessed with a mechanistic view of nature while Frankenstein attempts to challenge his scientific experiments with a Baconian view of science. Frankenstein extends his knowledge deep and wide to the extent that no one, including the professors, can match him at the University of Ingolstadt. Furthermore, using a Baconian scientific idea, he utilizes "a spark of being" (38), also known as energy of electricity, to create a

new form of life. As it was already proven that the interaction between electricity and chemistry enables physical reactions of the body, his experiment is considered as a creative work applying the physiological knowledge of the physical body and the modern chemical knowledge that he learned from Waldman. Therefore, although Frankenstein has a medieval alchemistic fancy of "immortality and power" (29, 38), likened to the fantasies of Marlowe's Dr. Faustus for example, his creation of a human monster can be assumed to be the result of complex scientific research.

Dr. Jekyll who tried to develop a transcendental medicine clearly states that "the direction of my scientific studies, which led wholly towards the mystic and the transcendental, reacted and shed a strong light on this consciousness of the perennial war among my members" (55). What he is talking about here is the struggle between good and evil that will result in a split personality. However, it is clear from Dr. Jekyll's research that the chemical reaction could cause the bifurcation of two dispositions coexisting within one physical body. Thus it is his scientific discovery that suggests the miraculous possibility of separating the two properties, and the observation and verification could be possible only through the scientific experiment that took place in his lab.

While Jekyll's experimentations are rarely known to others, Dr. Moreau has garnered far more attention in his scientific community as we find out from Edward Prendick:

Moreau was, I suppose, about fifty, -- a prominent and masterful physiologist, well known in scientific circles for his extraordinary



imagination and his brutal directness in discussion. . . . He had published some very astonishing facts in connection with the transfusion of blood, and, in addition, was known to be doing valuable work on morbid growths. (32)

Dr. Moreau's creations that were made in the 'House of Pain' are "animals carven and wrought into new shapes" (74). All animals must go through a physiological surgery performed by him. Like Jekyll's experiment on himself, the surgery should ensure that "the chemical rhythm of the creature may also be made to undergo an enduring modification." What is important here is that making a figure of the transformed animal is possible only through the chemistry involved. Hence, Dr. Moreau has the capability to "transplant tissue from one part of an animal to another or from one animal to another, to alter its chemical reactions and methods of growth, to modify the articulations of its limbs, and indeed to change it in its most intimate structure?" (75) Moreau's intention in transforming animals mentally as well as physically is to speed up the evolutionary process. He states to Prendick, "I dip a living creature into the bath of burning pain, I say: this time I will burn out all the animal, this time I will make a rational creature of my own. After all, what is ten years? Man has been a hundred thousand in the making?" (81). In his experiments, it seems, Moreau would like to ascertain the validity of Charles Darwin's evolutionary theory that humans and animals share a common ancestry, while he also wants to prove that animals can be turned quickly back into humans by biological and medical experimentations, even without a long evolutionary epoch.

Frankenstein's, Dr. Jekyll's, and Dr. Moreau's experiments all show that they put much value on the newly emerged field of science, chemistry. Dr. Jekyll's work is completely based on chemical experiments and discoveries. His statement that his lab was used for anatomy before his chemical experiments clearly shows that Jekyll subconsciously considered old anatomy to be inferior to his chemical experiments. On the other hand, Dr. Moreau's experiment is closely related with pathological anatomy, which includes chemical secretion, in which meticulous observation of the physical body is needed to cure physical or mental illness. Analyzing a scientific journal printed in the early nineteenth century, Catherine Crawford states that forensics relies totally on medical science, more specifically chemistry and pathological anatomy (208). This suggests that chemistry and anatomy, and anatomy and physiology have a close relationship with one another. Particularly pertinent here to my argument about the preeminence of the new scientific tradition, Crawford states that many medical scientists were intrigued by chemistry. She explains the interrelation between chemistry and other fields of science as follows:

The science of chemistry, too, was attracting interest and raising expectations among medical men during these years, for the chemical analysis of bodily fluids appeared to offer objective, visible, and measurable facts in the place of qualities that were inferred or subjectively perceived. Those who sought more certainty for medicine were particularly attracted by the potential of chemical science to illuminate the nature and effects of therapeutic substances. (209)

Although the revolutionary development of science started from the laboratories of scientists such as Frankenstein, Jekyll and Moreau, this did not mean that the work conducted there did not attract social condemnation and criticism, mainly because traditional beliefs were believed to be endangered. Despite the importance of the variety of achievements made within the labs, therefore, research always raised academic, governmental, and religious issues. As Mason Harris suggests, "the new priesthood of science, dedicated to the theory of evolution, challenged a more traditional religious and literary leadership" (104). A good example of this tension occurred with the anti-vivisection movement debate in England when many intellectuals, including Frances Dower Cobbe, George Hoggan, and Richard Hutton, "joined forces to found an anti-vivisection society in November 1875" (Preece 416). In 1876, the Vivisection Act went into effect which meant that vivisection began to be allowed under anesthetic conditions to a few practitioners who had a license to do so for a beneficial purpose. The reason Dr. Moreau was evicted from London was because he did not follow the vivisection law in his animal experiments that was passed at this time, and therefore violated a pre-existing law (McLean 42).

As Thomas Kuhn suggests, science never stops evolving because of the ongoing scientific revolution, which means that the scientific profession "can no longer evade anomalies that subvert the existing tradition of scientific practice" (6). Change in science can generate momentum to change the world and it is the lab that provides the space where new scientific paradigms are formed even though the space may be only a dark and dreary lab, as in the nineteenth century. Scientific discovery and mechanical invention in the lab also gained cultural value because they became

entangled with the world outside. In other words, "science" became "embedded in culture" (Levine 25) and acquired cultural power in Victorian society. Equally as important was the fact that experiments could provide a powerful synthetic capability. As Colin Manlove suggests in his article, 'Charles Kingsley, H. G. Wells, and the Machine in Victorian Fiction,' "the mechanical could be almost invisibly fused with the natural and both, in turn, with the spiritual" (Manlove 216). This hybridization spoke to the larger appropriation of power that science had achieved, and ensured not only its role in constructing a spiritual culture and a materialistic society but also in creating a new paradigm of the world.

So while scientific experiments that are conducted by the scientists within the laboratories are merely acts to satisfy their ambitions, ultimately they contribute to the development of influential discoveries and inventions. In this sense, their work not only satisfies their scientific desires, but also builds the cornerstone of social change. As can be seen in the debate between Dr. Lanyon and Dr. Jekyll about the nature of transcendental medicine, nevertheless, new results derived from the laboratories produced controversy in academic, political, and religious fields.

### **Anxiety and Conflict over the Popular Science**

The Victorian society changed greatly because of new inventions and innovations brought about by developments in science and technology. Thomas Carlyle claimed the nineteenth century as a 'Mechanical Age' in "Signs of the Times" (1829). Along with the invention of diverse machines, science and technology came to penetrate everyday parts of life. Consequently, "Progress and technology seemed inseparable. The machine of science were devised not merely to explore nature, but to

exploit it” (Brake 36-7). As a result, Victorians developed serious concerns that machines would control humans and that humans would become slaves of the machines. Samuel Butler reflected in *Erewhon* a worry about a future world in which “the machines were ultimately destined to supplant the race of man” (97). Victorian workers’ concern and frustration of the machines inspired the Luddite movement in which the machines in the mills were vandalized or broken by the workers.

The detective stories of Stevenson’s *Dr Jekyll and Mr Hyde* and Conan Doyle’s *A Study in Scarlet* intriguingly reflect a social and cultural conflict caused by this scientific progress. In particular, these kinds of stories revealed conflicts between new science and traditional culture. In this section, the relation between Dr. Jekyll and Dr. Lanyon, Dr. Jekyll’s scientific experiment, and Sherlock Holmes’ personal characteristics and his unique way of detecting will be analyzed and interpreted as a conflict between science and culture that T. H. Huxley, Matthew Arnold, and C. P. Snow, George Levine, Edward Wilson and others have suggested and shared for the last two centuries.

The tense relations between natural science and humanities studies can be traced back to the debate between science and culture or between science and literature that T. H. Huxley and Matthew Arnold raised two centuries ago. The general responses about popular science and technology in the nineteenth century were diverse. The rapid development of science, Darwin’s evolutionary theory, and the professionally improved status of scientists generated a reactionary discourse among conservative scholars and theologians who sought to protect culture and the traditions of society. In the 1880s, T. H. Huxley supported science and its education in school,

criticizing the conservative scholars like Matthew Arnold who lamented the vulgarization of English culture and tradition by liberal scholars and scientists.

The advancement of scientific technology after The Industrial Revolution destabilized the existing order of humanities and reorganized new scientific, intellectual, epistemological, and ontological orders. It was at this moment that the questions were raised about the a priori status of the main scholastic disciplines of liberal arts and culture. A famous debate arose between Huxley and Arnold on classics, liberal arts, and culture. T. H. Huxley stated in a lecture called “Science and Culture” (1880) at a college in Birmingham.

For I hold very strongly by two convictions: The first is, that neither the discipline nor the subject-matter of classical education is of such direct value to the student of physical science as to justify the expenditure of valuable time upon either; and the second is, that for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education. (4-5)

He asserted the importance of science in an era where science was neglected, and devalued the relative worth of liberal arts and classics education, calling them outdated. In particular, he showed a harsh and critical attitude toward the educated gentlemen who insisted only on the importance of a liberal art education:

In their belief, culture is obtainable only by a liberal education; and a liberal education is synonymous, not merely with education and instruction in literature, but in one particular form of literature, namely,

that of Greek and Roman antiquity. They hold that the man who has learned Latin and Greek, however little, is educated; while he who is versed in other branches of knowledge, however deeply, is a more or less respectable specialist, not admissible into cultured caste. (8)

Criticizing the people of culture who ignored “the practical value of science” (4), but valued the culture and arts, Huxley emphasized the importance of science education. On Huxley’s assertion, on the other hand, Matthew Arnold stated in “Literature and Science” (1882) that knowing ancient Greece doesn’t only mean knowing the country’s literature and art, but also knowing the founders of modern mathematics, physics, astronomy, and biology. On learning about modern countries, he responded that it means not only learning about their literature but also about the accomplishments of scientists including Darwin. To show his disagreement with Huxley, Arnold defined literature as follows:

Literature is a large word; it may mean everything written with letters or printed in a book. Euclid’s Elements and Newton’s Principia are thus literature. All knowledge that reaches us through books is literature. . . . I do not mean, by knowing ancient Rome, knowing merely more or less of Latin belles lettres, and taking no account of Rome’s military and political and legal and administrative work in the world; and as, by knowing ancient Greece, I understand knowing her as the giver of Greek art, and the guide to a free and right use of reason and to scientific method, and the founder of our mathematics and physics and

astronomy and biology. . . . By knowing modern nations, I mean not merely knowing their belles lettres, but knowing also what has been done by such men as Copernicus, Galileo, Newton, Darwin. (7-8)

The culture that he suggested in his 'Culture and Anarchy' is "the great help out of our present difficulties" (viii), and "a pursuit of our total perfection by means of getting to know" (xvi). By including mathematics, physics, astronomy, biology, and other non-literary disciplines in his "Literature and Science," he attempted to expand the concept of culture beyond how it had been traditionally understood (4).

Nevertheless, by the scientific disciplines in 'Literature and Science,' he meant the classical sciences, not what was called 'the popular science.' Consequently, his response should not be understood not as a change of his conservative attitude.<sup>10</sup> He was still relying on past traditions and culture. What he showed in the debate with T.

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<sup>10</sup> What Arnold means by science is the science of scientists belonging to the English Church, which means natural theologians, not that of those who were not conformists: "The great works by which, not only in literature, art, and science generally, but in religion itself, the human spirit has manifested its approaches to totality, and a full, harmonious perfection, and by which it stimulates and helps forward the world's general perfection, come, not from Nonconformists, but from men who either belong to Establishments or have been trained in them"(xix). Nevertheless, the reason why Arnold included Darwin in the list of scientists is because Darwin never claimed that he was an atheist himself and that he denied God. Darwin revealed in a letter sent to John Fordyce in 1879: "I have never been an atheist in the sense of denying the existence of a God" and he confessed finally in death-bed that he would come back to God. <http://www.darwinproject.ac.uk/entry-12041>. (2011 July 15)



H. Huxley, in fact, was not that different from the opinions of other conservative scholars, theologians, and scientists who felt uncomfortable about the new science and marginalized it to the edge of traditional culture and liberal arts. Before and after the nineteenth century, those scholars, theologians, scientists had got involved in the academic activities of the Royal Society of London and the British Association for the Advancement of Science whose purposes were to encourage and advance natural scientific studies whose belief was that “natural science and Christian theology were complementary, as were their clerical and scientific callings” (B. Lightman 40). Accordingly, many scientists adopted a conservative vision, which would sustain the traditional value of life of the Victorian period.

However, as Darwin’s evolutionary theory gained power, the interpretation about natural science diverged into the two camps: pro-Darwinian natural scientists who insisted on science as an independent scholarly discipline and anti-Darwinian natural Oxbridge scientists who insisted that all scientific phenomena and theories should be understood as those belonging to natural theology (B. Lightman 43). Francis Orpen Morris, Ireland’s ornithologist and entomologist, was one of the representatives of the latter case:

After the publication of *the Origin*, Morris became a vigorous opponent of evolutionary theory. The depth of Morris’s hostility is evident in his acrid exchange of correspondence with T. H. Huxley. . . . Morris depicted Darwinism as a “flimsy fancy.” (B. Lightman 45-46)

In other words, natural scientists like Morris who emphasized natural theology

were afraid that pro-Darwinian scientists would endanger the sacred humanity while denying God' divinity and accepting Darwinian theory. Under these crisscrossing responses, however, "The Victorians were also excited by new scientific discoveries, such as Darwin's theory of natural selection, and became engrossed in debates over their validity" (B. Lightman 3). Before this kind of debate, science was considered as an extension of theology which could be shared by theologians and social and cultural elites.

Although with the advent of scientific revolution science came what could be termed 'popular science,' H. G. Wells explicated in an article, "Popularizing Science," in *Nature* that "popular Science, it is to be feared, is a phrase that conveys a certain flavor of contempt to many a scientific worker" (Recited B. Lightman 423). Ironically this situation led many intellectuals and writers to have more interest in natural science and evolutionary theory. As intellectuals, writers got used to Darwin's evolution theory, one of the hot issues in the Victorian period, and paid attention to various aspects of scientific development. By writing this statement, Wells passed on the critical sentiment of the conservatives in late nineteenth century who valued the physical worth of natural science. Although authors and intellectuals in the period recognized the new natural scientific facts, there remained a conflict between modern science's positivism, which states that facts verified with physical eyes are the only truth, and the humanistic values based upon tradition and culture.

It is interesting that Conan Doyle's Holmes is one of the good exemplary characters who can show such a conflict and disharmony in his own characteristics as a scientist. He is a young man of purely scientific disposition. However, what is at

stake here though is the lack of scientific/cultural harmonization displayed by his scientific properties. Even if Holmes is a master of a scientific discipline and knowledge, he might be regarded not as a man of intellect and culture, but simply as a skillful expert of masterful knowledge and information. His ‘problem’ is explained in C. P. Snow’s *The Two Cultures and The Scientific Revolution* (1959), where he argues that while humanistic studies are unwilling to change, preferring a classical culture, and conservative society prefers tradition and culture to change by scientific development, being afraid of advent of popular science, natural scientists remained doubtful of the validity of such humanistic studies. As a result, the incompatible bifurcation of the two cultures became deeper. In this respect, Snow, who discussed the serious estrangement between science and culture, emphasizes the necessity of improving the cross-cultural understanding between humanists and scientists in order to solve the problem. According to him, scientists do not have interest even in literary works which are universally recognized important because the books are considered as fruitless by them even if the books are like “bread and butter” to the literary intellectuals (14).<sup>11</sup> Snow points out that scientists have a superficial understanding of traditional culture, saying that if scientists are asked which book they read, they would

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<sup>11</sup> In the similar way, as for intellectuals of the literature, they are asked “how many of them could describe the Second Law of Thermodynamics. The response is cold” (Snow 16). Furthermore, Snow says, “if I ask an even simpler question – such as, What do you mean by mass, or acceleration, which is the scientific equivalent of saying, Can you read?” (16) It is suggested that the equivalent question to the scientist is: “Have you read a work of Shakespeare’s?” (16)

say, “Well I’ve tried a bit of Dickens,” and that “the links with the traditional culture should be so tenuous, nothing more than a formal touch of the cap” (13). Snow’s statement that scientists do not show interest in humanistic culture and literature can be applied to Holmes in *A Study of Scarlet*. Dr. Watson explains Holmes’ characteristics as follows:

His ignorance was as remarkable as his knowledge. Of contemporary literature, philosophy, and politics he appeared to know next to nothing. Upon my quoting Thomas Carlyle, he inquired in the naivest way who he might be and what he had done. My surprise reached a climax, however, when I found incidentally that he was ignorant of the Copernican Theory and of the composition of the Solar System. That any civilized human being in this nineteenth century should not be aware that the earth travelled round the sun appeared to be to me such an extraordinary fact that I could hardly realize it. (17)

Holmes also “said that he would acquire no knowledge which did not bear upon his object. Therefore all the knowledge which he possessed was such as would be useful to him” (17-18). In that sense, it is interesting that Dr. Watson collates Holmes’ knowledge as follows.

- 1 Knowledge of Literature — nil.
- 2 Knowledge of Philosophy — nil.
- 3 Knowledge of Astronomy — nil.
- 4 Knowledge of Politics — Feeble.

5 Knowledge of Botany — Variable. Well up in belladonna, opium and poisons generally. Knows nothing of practical gardening.

6 Knowledge of Geology — Practical, but limited. Tells at a glance different soils from each other. After walks, has shown me splashes upon his trousers, and told me by their colour and consistence in what part of London he had received them.

7 Knowledge of Chemistry — Profound.

8 Knowledge of Anatomy — Accurate, but unsystematic.

9 Knowledge of Sensational Literature — Immense. He appears to know every detail of every horror perpetrated in the century.

10 Plays the violin well.

11 Is an expert singlestick player, boxer and swordsman.

12 Has a good practical knowledge of British law. (18)

Watson's classification of Holmes' knowledge of humanities such as literature, philosophy, astronomy, politics and of natural sciences such as biology, geology, chemistry, anatomy looks like the taxonomy made by Carl Von Linne, the first founder of modern taxonomy of animals and plants in the eighteenth century. The order certainly starts with a traditional sense of humanistic knowledge, followed by disciplines of science which are used in competition with those of the liberal arts and culture. Holmes is a scientist who is working at a chemical laboratory in a hospital. As a scientifically obsessed young man, he is an anatomist and chemist. Uneducated at all in any educational institutions, his experiments are all desultory and weird, but he has

knowledge great enough to alarm even the medical professors (9). He designed a simple chemical experiment, by which an old brownish stain can be ascertained whether it is from blood, mud, rust, or fruit. That is, he achieved “the most practical medico-legal discovery” (11), which can be called the “Sherlock Holmes test.” As can be noticed, he is considerably erudite in science while very weak or unlearned in liberal arts and literature. It is in Holmes and his methods, and in a discussion of his talents in science and his ignorance of humanistic knowledge that the debate of the two cultures at this time can be fully articulated.

As another literary example, *Dr Jekyll and Mr Hyde* articulates the conflict between the values of science and culture. Dr Jekyll excels in every social aspect as a scientist and doctor, but he is faithful not only to his intellect and conscience, but also to his instinct and pleasure principle. That is, he suffers pain due to “man’s dual nature” (55). As a chemist, he tries to get out of the trouble by inventing a “transcendental medicine” (53), with the thought that “If each [of good and evil minds] . . . could but be housed in separate identities, life would be relieved of all that was unbearable” (56). As a successful result of his experiment, he can lead the life of Dr. Jekyll as a person of intellect and culture during the day. On the other hand, during the night, as Edward Hyde he sticks to a life of instinct and desire under the influence of medicine. Therefore, Hyde is compared to an anti-social and violent apelike devil, unlike an ordinary person who acts on conscience. Although Dr. Jekyll proves that his scientific theory is valid, the unexpected side-effect of his experiment implies in some sense the potential menace of the new science, which is revealed through Edward Hyde’s violence and intemperance as well as his ugly appearance.

The contradictory outcomes of Dr. Jekyll's research reflect the social and cultural contradictions of the age. This confronting situation is dramatized when Hyde transforms himself into a feature of Dr. Jekyll just in front of Dr. Lanyon. As reviewed already in the second chapter, a series of events between Dr. Jekyll and Dr. Lanyon symbolically epitomize the social and cultural response to Darwin's evolutionary theory. After Dr. Lanyon notices ape-like ugly Hyde changing into Dr. Jekyll, the shock causes his death. Dr. Lanyon's traumatic shock symbolizes the shock into which a radical development of science and scientific theory, for example, Darwin's evolutionary theory, drove Victorians as a whole. The social conflict after this epistemological and ontological shock, the subsequent hatred toward the new science, and the drastic change in everyday life after the scientific revolution, all must have affected conservatives and traditionalists in a retrogressive way.

### **Consilience of Science and Culture**

Given the scientific qualities that Holmes possesses, he can be also looked down upon as simply an expert of skills and techniques in his own field, for he lacks the traits of an intellectual who enjoys literature, philosophy, astronomy and the like. Through both the eyes of Dr. Watson and the qualities of Holmes, Conan Doyle intriguingly reveals the conflict germinated in the society by the two cultures. In *The Two Cultures*, C. P. Snow points out a problematic separateness and exclusiveness of science and culture/literature. One of the important facts that Snow laments over in his *Two Cultures*, as mentioned before, is that the people of science education or the scientists have yet to be recognized as genuine intellectuals, even in the twentieth century. Because "Intellectuals, in particular literary intellectuals, are natural

Luddites” (23), Snow criticizes the conservative attitude that the literary intellectuals show while denying any new changes and new values that follow. Such a view of Snow’s implies that there would be no difference in attitude toward the other between Luddites and today’s humanists.

Snow complains that, “almost none of the talent, almost none of the imaginative energy, went back into the revolution which was producing the wealth. The traditional culture became more abstracted from it as it became more wealthy, trained its young men for administration, for the Indian Empire, for the purpose of perpetuating the culture itself”, and he goes on to criticize the fact that the culture “never in any circumstances to equip them to understand the revolution or take part in it” (24-25). In this context, it can be said that Snow puts emphasis upon the education of science. As T. H. Huxley criticized the narrow-mindedness of literature and humanity studies and emphasized the importance of science education, so Snow, as a scientist and writer, estimated that the problem between the two cultures originates from the humanists’ indifference to science and the English government’s contempt for the education of science.

What Snow would have like to have seen is a degree of consilience. It is a theory promoted by George Levine who, in *One Culture* (1987), argues for a return to the beginning when the two cultures were originally one culture. Criticizing Snow for putting too much emphasis on the division of the two cultures of each characteristic, he put more effort into making a theory of unifying the cultures. Notably, Levine tries to show how each of the two cultures, having been discussed separately, contribute to the formation of ONE culture. He says that “science is no more exempt from the



constraints of nonspecialist culture than literature is. . . . literature and science, whatever else they may be, are modes of discourse, neither of which is privileged except by the conventions of the cultures in which they are embedded” (Levine 3). He adds that the different disciplines are just “two modes that suggest that they can and should be studied as deriving from common cultural sources” (3-4).

In his writing, Levine points out the problems of intellectuals whose adverse reaction to science is wrong because the authority of science has been implicitly accepted socially and culturally. However, as a counterpoint, he stresses that the problem of this authority of science is its excessive “imperialist positivism” that “in the scientific method. . . we have our own way to truth” (23). Commenting that science is also decided and made in the social and political context and discourse (18), and that it is one of the greatest achievements that human minds have ever made (24), Levine tries to clarify that science and literature are rooted into one culture: “to get to the heart of the culture one can travel the road of science, the road of literature, or – better – both” (25).

Snow criticized intellectuals of the two cultures for not showing any interest in the other culture, declaring that “this polarization is sheer loss to us all. To us as people, to our society” (12). It was for this reason that Edward Wilson as a sociobiologist, eco-activist, and bioethicist, makes an in-depth suggestion in his *Consilience: The Unity of Knowledge* (1988) that the pursuit of consilience between extremely divided science and humanities would be a resolution of the problem that Snow and Levine worried about. Wilson draws on more advanced discourse than Levine’s theory of one culture in that he designs a discourse bridging the two cultures

into one and draws on concrete examples to show that the two cultures are really all one formation of culture. Fundamental examples of the consilience of the two cultures vivify how science and culture are co-related and co-evolved under the co-influence of the two:

The communal mind of literate societies - world culture - is an immensely larger loom. Through science it has gained the power to map external reality far beyond the reach of a single mind, and through the arts the means to construct narratives, images, and rhythms immeasurably more diverse than the products of any solitary genius. The loom is the same for both enterprises, for science and for the arts, and there is a general explanation of its origin and nature and thence of the human condition, proceeding from the deep history of genetic evolution to modern culture. (Wilson 13)

As the world culture was made and developed through science and art, not only the roots of culture and art, but also the present conditions of the human being could be explicated through consilience theory in the context of evolution. In "From Genes to Culture," Wilson shows how any human's genes could have had an evolving relationship with culture through the cases of human's "epigenetic" (138) fear of snakes, his capacity of using "paralanguage" (172), and his "creation of color vocabularies" (175). Using the Dawkin's term of "meme" (148)<sup>12</sup> which "conveys the

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<sup>12</sup> Explaining 'gen-culture coevolution' in 1981, Wilson used Dawkin's "meme." According to what he means by the concept, the "meme" as the notion of a culture functions like the node of

idea of a unit of cultural transmission” (Dawkins 192), Wilson elucidates the way that "gene-culture coevolution” (138) has been made and developed. In other words, the human mind could be also inherited through the meme, defined here as a minimal unit of a culture gene. This view demonstrates that science and literature coexist and co-evolve in close relation with each other. The outlook that human mind plays a crucial role in building culture and then the culture is genetically handed down to the next generation is a theoretical attempt to perceive culture from a biological perspective. That is, the human mind can be biologically analyzed with the consilience theory.

Under the assumption that natural science is a material-based study and culture is a study of a mind-based phenomenon, Dr. Jekyll’s experiment can be explained in the same context. Dr. Jekyll wants to treat human mind matter with material science. That is, believing that the matter of good and evil can be treated with medicine invented by a scientific experiment, he risks his life by taking the medicine in order to divide good and evil in himself: “It was the curse of mankind that these incongruous faggots were thus bound together – that in the agonized womb of consciousness, these polar twins should be continuously struggling. How, then, were they dissociated?” (56) Even though his belief has been criticized by Dr. Lanyon and his colleagues, Dr. Jekyll

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semantic memory, which means it works as “the node-as-meme” (148). In the chapter of “Memes: the New Replicators” in *The Selfish Gene* (1989), Dawkins insisted that “Cultural transmission is analogous to genetic transmission” and that this generates “a form of evolution” (189). This shows that meme is cultural replicator and gene transmission agent, which means that individual thought and belief are transferred to the next generation through meme as biological information is transferred through self-replication of gene.

never stops inventing the medicine to counter-control human mind – the dual nature - which possesses or controls his body:

I began to perceive more deeply than it has ever yet been stated, the trembling immateriality, the mistlike transience, of this seemingly so solid body in which we walk attired. Certain agents I found to have the power to shake and pluck back that fleshly vestment, even as a wind might toss the curtains of a pavilion. . . . I not only recognised my natural body from the mere aura and effulgence of certain of the powers that made up my spirit, but managed to compound a drug by which these powers should be dethroned from their supremacy, and a second form and countenance substituted, none the less natural to me because they were the expression, and bore the stamp of lower elements in my soul. (56-57)

Rather than supporting the idea that the mind and culture excelled material and science, Dr. Jekyll suggests a possibility that he would put the mind and culture under the control of material and science by his prescribed medicine. This also implies a possibility that there would be an intercommunication and interrelation between mind and material and between culture and science. In other words, the fact that the transcendental material of Dr. Jekyll's has a connection point with the mind was analogous to the idea of the inter-cooperation between science and culture. Regardless of the good or bad result of Dr. Jekyll's experiment, his experiment functions as evidence to show well how conflict and communication can be achieved through a

certain agency between material and mind, and between science and culture. In other words, as Wilson says, “The greatest enterprise of the mind has always been and always will be the attempted linkage of the sciences and humanities” (8). The experiment Dr. Jekyll has attempted can be regarded as an intercommunicative research of consilience designed to collapse the distinctions between the science of materials and culture of the mind.<sup>13</sup>

Conversely, if the symbolical problem of the conflict between humanities and science could attain a painful consilience in *Dr. Jekyll and Mr. Hyde*, the act in which Dr. Jekyll has tried to eliminate Mr. Hyde, a symbol of evil, can be considered as a traditional conservative gesture of denying coexistence and consilience between the two cultures. Nevertheless, the constructive fact that Dr. Jekyll and Mr. Hyde are inseparably caged in one body implies a symbol of coexistence between natural sciences and humanities in one world. The two cultures must be in a reciprocal and cooperative relationship since the twins cannot live only if one of the twins gets sick and dies. In a conclusion, all the discourses above suggest that although the sciences and humanity look totally different, they can have a cooperative and consilient relationship.

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<sup>13</sup> Stating that "Consilience is the key to unification" (8), Wilson approaches the consilience and unification of two cultures from a biological level. The fact that, in an epigenetic level, psychological culture can be biologically transferred through 'meme' to the next generation, means that something psychological can be turned into something biological, and something material can also construct or influence the mind.

Culture accommodates comprehensive meanings of liberal education, literature, humanities, but it is also used as the connotative term to stand for an antagonistic view of natural science. Before the nineteenth century, natural science was closer to technical knowledge rather than liberal education, but in the nineteenth century, it began to be recognized as a legitimate culture despite the debate over the issue. Nevertheless, those who possessed more knowledge about natural science were regarded as a specialist with rich knowledge rather than a man of culture. This occurred because the conservative class had the fixed idea that, as Arnold stated, it is only the culture that makes “the true completion of man' possible, and that is the best for 'enhancing all portions of society” (xvi), and that can provide man with the best that can be experienced by him.

This notion of the two cultures is strongly reflected in the plot and composition with the characters of Stevenson's *Dr Jekyll and Mr Hyde* and Conan Doyle's *A Study in Scarlet*. The symbolic meaning of Lanyon's reaction toward the hideous Hyde's turning into Jekyll, Sir Conan Doyle's emphasis on talents related to humanities rather than the power of natural sciences, the fact that Holmes has completely science-oriented abilities, the fact that the author imbues Holmes with musical talent while bearing Darwin's evaluation of the music in mind, and lastly the emphasis that the deductive inference is utilized in his detective methods which was prevalent in archaeology, entomology, botany, biology, chemistry, physics, history, and philosophy, all show the influence of theories related to the natural sciences but also show the conflict between natural sciences and humanities at the same time.

Judging from the inter-relational aspect between material and spirit, that is,

science and culture, Dr. Jekyll's transcendental medicine that Dr. Jekyll invented has effects of adjusting and controlling minds. Through Dr. Jekyll's experiment, it becomes clear that the mental is based upon the material, and materials also have interrelation with mental functions. Thus the matter of science and culture can be reduced to the matter of material and mental. Furthermore, due to the advent of consistent thought, we are now being pressured to make a critical turn in our thoughts regarding the relation between religion and science, which never look as if they could be reducible. Nowadays, the studies on principles of life and principles of nature, and the application studies of those principles form a deep relationship with humanist values, moving beyond from the issue of scientific dimension to the issue of practical bioethics. As Joseph Carroll mentions, "the humanities are the last frontier of science" (69), a necessary way of thinking required in the period of convergence.

## CHAPTER 5

### THE MORAL DILEMMA: EVOLUTION, ECOLOGY, AND BIOETHICS

In this chapter, the ecological and bioethical discourses of Michel Foucault, Gille Deleuze, and Maurice Merleau-Ponty will be situated alongside a discourse of the role and function of the human and/or animal body in the nineteenth century novels such as *Frankenstein*, *The Island of Dr. Moreau*, and *Dr Jekyll and Mr Hyde*. All of these works reveal the complexities of ecological, evolutionary, and bioethical attitudes in terms of how the characters in the fiction participate in scientific experiments of the human or animal body and mind.

The inferior body has been regarded as less important than superior mental capacities. The first part of this chapter, however, will argue that the potentials of the body are no less important than those of the mind. It is as if the body speaks for its rights. The body senses seems to consistently attempt to recover and claim their decisive right and role in ecologically balancing human physical and mental equilibrium. The second part will check how science functions, mainly chemically, to interconnect between the physical and the mental in the fiction. As scientists often happen to be unaware of the importance of what they do with and to the body, the final section will deal with the bioethics of scientific and medical works.

#### **Ecological Murmuring of Body Senses**

The theorists Foucault, Deleuze and Merleau-Ponty argue that the body is not just a container of soul and spirit, but it is the foremost organ to generate emotion and feeling, which are no less valuable than reason and intelligence. In Merleau-Ponty's



terms for example, the body is the a priori ecological and bioethical medium through which the world can be perceived. Furthermore, the theorists cited in this section have provided a foundational humanistic discourse for a discussion of environmental change, evolution of species, and the genealogical and genetic realm of ecology. They have analyzed objects from a natural scientific approach and also expressed ecological theories on a historic-biological level. The focus here then is on the ecological symbiosis between the transformation and mutation of body and the moral issues raised by such an interaction. By applying the theorists' concepts of ecology and evolution to the novels, it is possible to observe the interaction of natural science, medicine and body and analyze the bioethical implication of such interrelationships.

As noted in chapter two, Wilde was already convinced of the interconnection of human consciousness and the material body, and elaborated upon the importance of the organic activities between mind and body, and beautified the function of the material body that he believed had been ignored and despised. In his theory about art, Wilde would have found his ideas congruent with Foucault's insistence on abolishing bodily restrictions. Foucault describes in *Discipline and Punish* (1977) how controlling powers incorporated sexual and political ideology into the human body through how it punished crimes. In other words, Foucault explored what kinds of restrictions used to bind the people by normal or abnormal means to the laws in the modern European age. In particular, after abolishment of the open execution in the late eighteenth century, he argues that "The expiation that once rained down upon the body, it must be replaced by a punishment that acts in depth on the heart, the thoughts, the will, the inclinations"

(*Discipline 16*). The stronger punishment to the mind rather than the body resulted in the birth of more institutionalized and systemized forms of prisons where more complex ways of giving pain and torture are invented and designed to put the prisoners and their body under restriction and surveillance.

Foucault also addressed the institutionalized suppressing of sexuality, focusing on Victorian culture of sexuality in *History of Sexuality* (1984). As the body was to be imprisoned, so “Sexuality was carefully confined; it moved into the home. The conjugal family took custody of it and absorbed it into the serious function of reproduction” (*History 3*). In regard to my point in this chapter, what becomes more illuminating is Foucault’s comment that the object that should be punished, “must be the soul” (*Discipline 16*). As the body is to be confined, the soul also becomes what should be inspected and controlled. As clearly delineated in Wilde’s idea of the body and the soul in *The Picture of Dorian Gray*, the body and the soul are interlinked, the one influencing the other. For Gray, even though his sexuality doesn’t seem portrayed to be restrained at all, it turns out that he/his body is so conscious of the social restraint against his sexuality that he/his soul will never feel free. In the final part of the novel, he is never free of the punishment inflicted upon those who go against social norms and customs. In that sense, Gray is a fictional figure who reveals the Victorian social belief that the liberation of bodily and sexual desire would ultimately destroy social cultures and traditions. Accordingly, it can be said that he cannot but avoid the ultimate punishment “calculated according to detailed rules” in accordance “with the gravity of

the crime” (*Discipline* 34).<sup>14</sup>

Punishments are inflicted, according to David Armstrong, in terms of the ‘political anatomy of body.’<sup>15</sup> The desirable quantity and degree of pain as a punishment for the criminals is given to their bodies with the goal of rehabilitating and edifying them into becoming better citizens. In the same context, using not only medical knowledge of nosology, which is a study of the classification of disease, but also the operational skills needed to give pain to the body, the controlling powers could affect the optimal combination of pain and punishment to the criminals. As a result, social and cultural ideology entered the human mind and heart by delivering pain to the body.

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<sup>14</sup> Foucault, who criticized the government level of control of human mentality and sexuality, contributes theoretically to this ecological restoration of the body which has been restrained in anti-ecological conditions made by capital and power. The bodily pleasure and feeling have been confined to the physical body, which has been depicted as far inferior to the rational mind. Foucault breaks down the solid tradition of reason and metaphysics which have ideologically influenced power over body and senses, and excavates the physical and sensual treasures – sense, sensation, pleasure, and desire - which have long been buried and ignored in the humble body.

<sup>15</sup> In his book, *Political Anatomy of the Body: Medical Knowledge in Britain in the Twentieth Century* (Cambridge: Cambridge UP, 1983), Armstrong insists that the distinction between the normal and the abnormal by medical norms in Foucaudian terms is arbitrary, and is determined by political purposes. See Paul H. Chalfant, "Review of *Political Anatomy of the Body: Medical Knowledge in Britain in the Twentieth Century*." *Social Forces* 63:2 (1984): 610-1.

In this context, Dr. Hyde's instinctual behaviors of wandering the nights to seek pleasure and desire have to be curbed in an era where rationalism and civility were prioritized. In the story, the values of the gentleman such as honor, intelligence, loyalty, friendship, and kindness are highly regarded. In addition, the gentleman should also be courteous in words and behavior. So it is inappropriate and shameful for Jekyll to expose a feeling of pleasure and desire, particularly, those which he may feel in his private and personal space and matter. Jekyll admits as much in the following passage:

And indeed the worst of my faults was a certain impatient gaiety of disposition, such as has made the happiness of many, but such as I found it hard to reconcile with my imperious desire to carry my head high, and wear a more than commonly grave countenance before the public. Hence it came about that I concealed my pleasures; and that when I reached years of reflection, and began to look round me and take stock of my progress and position in the world, I stood already committed to a profound duplicity of life. Many a man would have even blazoned such irregularities as I was guilty of; but from the high views that I had set before me, I regarded and hid them with an almost morbid sense of shame. (55)

The series of behavioral juxtapositions here – grave countenance versus irregularities – of which he is conscious testifies to the doubling of the Victorian masculine psyche. The repression of desire in the public persona leads Jekyll to explore and satiate his pleasure and desire through his double, Hyde. Hyde can be

interpreted as a kind of animal faithful to instinctive feelings, or a physical embodiment of pleasure and desire. There are two cases in particular that show how Hyde satiates Dr. Jekyll's desires for forbidden pleasures. In the first, after Mr. Richard Enfield noticed "a little man" and a girl of maybe eight or ten" running "into one another naturally enough at the corner," he explains to Mr. Utterson that "the horrible part of the thing" happened that "the man trampled calmly over the child's body and left her screaming on the ground" (7). This trampling may be interpreted as connoting sexual abuse or intercourse with a street girl who Dr. Jekyll might have desired. In the second case, Hyde murders Sir Danvers Carew, a famed politician. A maid witnesses him "trampling his victim under foot and hailing down a storm of blows, under which the bones were audibly shattered and the body jumped upon the roadway" (22). The cruel violent attempt is a symbolic gesture to satiate his dissatisfaction or frustration over a political and social culture that does not approve of his disposition. At this juncture he is still able to separate out the civilized gentleman in him and what he becomes in the guise of Hyde. He confesses that "the pleasures which [he] made haste to seek in [his] disguise were undignified," and he goes on to say that "in the hands of Edward Hyde, they soon began to turn toward the monstrous" (60). But gradually, his conscience and senses grow numb and dull due to Hyde's awful and unruly emotional drive:

Henry Jekyll stood at times aghast before the acts of Edward Hyde; but the situation was apart from ordinary laws, and insidiously relaxed the grasp of conscience. It was Hyde, after all, and Hyde alone, that was

guilty. Jekyll was no worse; he woke again to his good qualities seemingly unimpaired; he would even make haste, where it was possible, to undo the evil done by Hyde. And thus his conscience slumbered. (60)

Hyde cannot control himself, committing whatever his instinctive disposition demands, as if he is an animal freed from a cage. Therefore, his behaviors and reactions are frequently compared to those of ape or animal: Hyde explodes in an “ape-like fury” (22) when he murders Sir Danvers Carew; his dismal screech inside the lab is portrayed as that “of mere animal terror, rang from the cabinet”; when “Poole swung the axe over his shoulder” (44) to break into Dr. Jekyll’s cabinet, Dr. Jekyll introduces Hyde as “the animal within [him] licking the chops of memory” (66) as if a serpent seducing Adam and Eve to pick the fruit of the tree of knowledge; and Hyde is described to play “the ape-like tricks” on Dr. Jekyll, “scrawling in my own hand blasphemies on the pages of [his] books, burning the letters and destroying the portrait of [his] father” (69). In general, Hyde is regarded as inhuman or subhuman: hideous, dirty, immoral, violent, and irrational who has to be stopped in any way possible.

In fact, Hyde is regarded as the kind of person who should be eliminated as his attitudes are rebellious, nonconformist, and disturbing and subversive to the mores of Victorian culture. Therefore, suppressing the animalistic instincts like Hyde’s is vital to maintain order and power in the society. Mr. Utterson represents those determined to uphold this order. His mission is to stabilize society by keeping social order and executing the laws faithfully:

Mr. Utterson the lawyer was a man of a rugged countenance, that was never lighted by a smile; cold, scanty and embarrassed in discourse; backward in sentiment. . . . He was austere with himself; drank gin when he was alone, to mortify a taste for vintages; and though he enjoyed the theatre, had not crossed the doors of one for twenty years. But he had an approved tolerance for others; sometimes wondering, almost with envy, at the high pressure of spirits involved in their misdeeds; and in any extremity inclined to help rather than to reprove.

(5)

As a lawyer of austerity and tolerance, probably, he would undoubtedly like to prevent Hyde from blackmailing Dr. Jekyll to steal money. Above all, however, the most important role assigned to Mr. Utterson is to stop the Hyde-masked Jekyll from deviating from the general rule of life as a gentleman because, if his abnormal and unnatural way of thinking and behaving is leniently overlooked, Utterson sees a society that would become unstable, losing its social, cultural, and traditional foundations. His function is to bind the society and its people to strict laws and orders of Victorian society.

*The Island of Doctor Moreau* also emphasizes the importance of retaining civilized values even in the midst of the uncivilized half-man and half-beast society where Moreau tortures the animals and inflicts pain on them to remove their animal instincts. He forces them to follow the regulations and laws of a religious human society in order to preserve the order and stability of the island, even though there is a

struggle in asserting those requirements:

Certain matters, however, in which old instinct was at war with Moreau's convenience, were in a less stable condition. A series of propositions called the Law (I had already heard them recited) battled in their minds with the deep-seated, ever-rebellious cravings of their animal natures. This Law they were ever repeating, I found, and ever breaking. (84)

The animals on the island are always trained and brainwashed to keep the law for the stability of the small community. In case the law is not kept, they are warned: “The Master and the House of Pain will come again. Woe be to him who breaks the Law!” As implied in the corporal punishment to come, the control, surveillance, and even punishment of the body are the cruelest but easiest way to control the body and mind. As Foucault puts in the *History of Sexuality I*, surveillance and control of power would be continued through the power classes’ intentional misuse of “medicalization of sexually peculiar” (44) and “perpetual spirals of power and pleasure” (45).

Furthermore, the torture and pain in *the Island of Doctor Moreau* is congruent with Deleuze’s logic of the body in *The Logic of Sensation*. As Deleuze indicates, the animals’ screaming pain in Moreau’s lab is reminded of the meat in the butcher shop in Francis Bacon’s painting entitled “Figure with Meat” (1954). Deleuze asserts that “As a portrait painter, Bacon is a painter of heads, not faces” (19). For him, the head is no longer the source of the thought and reason, but rather makes the metaphysical face cringe with the echoing scream of nameless pain. On the other hand, the body is the



organ of perception and the inevitable tool with which to survive. In other words, according to Deleuze's assertion that "The deformations that body undergoes are also the *animal traits* of the head" (19), bodily authenticity can be felt and perceived through the bodily sensual traits rather than the sublimity of the reason. Deleuze's reasoning here is in accord with Merleau-Ponty's assertion in *Phenomenology of Perception* (2008), that "the body is the pivot of the world" (94). The body is an immediate and central agent through which the world is perceived and experienced for the first time. This assertion negates and subverts the illusive history, superficial hypocrisy and metaphysical tradition that simply a face symbolizes.

For example, something interior and inexplicable such as emotion, sense and sensation began to supersede something exterior and explicable such as reason and empiricism in the fiction of *Dr. Jekyll and Mr. Hyde* and *The Picture of Dorian Gray*. In *Embodied: Victorian Literature and the Senses*, William A. Cohen employs the works of Dickens and Bronte, Trollope, Hardy, and Hopkins to address how Merleau-Ponty's concepts of body and senses are reflected in their works and how the roles of the body and senses are lingually represented in the work. Nevertheless, interestingly, only once mentioning *Dr. Jekyll and Mr. Hyde* and *The Picture of Dorian Gray* in the first chapter, Cohen explicates the roles of the exterior body and the interior mind as follows:

Famous gothic tales from late in the century capitalize on both the sensory and the sensational aspects of such fiction. Robert Louis Stevenson's *Dr. Jekyll and Mr. Hyde* (1886) and Oscar Wilde's *The*

*Picture of Dorian Gray* (1890-91) both transpose the interior being onto a distinct material form: in Stevenson's story, the grotesque embodiment of evil, Mr. Hyde, and in Wilde's, the soul-revealing portrait. In both cases, the newly created body, once differentiated from the protagonist's interior, serves as a narratable repository for hidden malevolence. Stevenson's story proposes the compound moral ambiguity of full human existence, which the extrojection of Hyde, as unalloyed evil, disrupts. The generic pastiche of *Dorian Gray* enables Wilde to present characters who are morally one-dimensional while indulging them (and his readers) in purportedly amoral aesthetic and bodily pleasures. (14-15)

Cohen shows how the exterior, material body interacts with, and embodies, immaterial, interior values like evil, malevolence, aesthetic and pleasure and how the bodily senses are expressed wordlessly. He addresses less the matter of good and evil with the discourse of body, than the fact that the continuous murmuring of the senses not only breaks down the wall of metaphysical and empirical reason and tradition, but also brings out the other way of "conceiving of human encounters with the world in perceptual terms and of perception itself as fundamentally corporeal" (18). In brief, the body is claiming its own right as a language of perception, while revealing how it has badly frustrated within itself, voiceless and revolting against the traditional culture and religion which have conceived it far inferior to them.

The active expression of these bodily senses is the function of Merleau-

Ponty's sense of "the lived body" (Frie 55), and is a concept that encompasses the body aesthetics emphasized in Wilde's aestheticism. Merleau-Ponty's assertion that "the body is to be compared, not to a physical object, but rather to a work of art" (174), can be applied to Gray's personal activity in which his own body itself is appreciated as an object of beauty. In *Nature* (1995), Merleau-Ponty expresses "the body . . . as an opening to the things and to others" (281). For him, the body is the beginning and end of perception. If modern Enlightenment's belief in reason is based on human's transcendence on objects and nature, therefore, Merleau-Ponty's thinking process is a part of a phenomenology of perception in which objects and nature are accepted and explicated as they are. After Husserl's phenomenological research with an emphasis upon the cognition of object itself, Merleau-Ponty puts much importance on the human body as a receptive perceptive organ throughout his research on nature and body. Merleau-Ponty expands his philosophical view of ecology by developing his thought from the concept of perception-through-body to the concept of the body-being-"flesh of the world" (Harney 133). In the context, Merleau-Ponty states in *Phenomenology of Perception* that "I am conscious of the world through the medium of my body" (95). As Harney notes, "For Merleau-Ponty, meaning is biologically based. It is not a product of mentality" (140) but a product of the body. Thus Merleau-Ponty's ecological thought starts from the body and returns to the body.

### **Science in Evolutionary and Ecological Body**

Merleau-Ponty's body theory can be related, and discussed, with ecological studies that also focus on the value of the nature of things. In this respect, Merleau-Ponty has a significant standing in the discourse of ecology and evolution because of

his deep thought not only about the nature of things, but also about how things change according to environmental conditions. According to an ecologist Louise Westling, “Merleau-Ponty accepted Darwinism evolution and explored its philosophical implications for the interrelation of human artistic activity with the environment” (33). If Merleau-Ponty’s phenomenology of perception is a theoretical attempt to recognize the world in biological terms, regarding nature, environment, science, inanimate, and animates as a whole natural unit, then Victorian fiction can metaphorically describe the natural or biological interactive relationship between the characters and the conflicts in the fiction.

Merleau-Ponty’s ecological view shows how matters of the body are related with change of environment and culture. The encounters between things with heterogeneous origins generate ceaseless and varied interactions. Interacting with the soul and mind, the body reflects their interactions within it and transforms itself anew. Such interaction and interrelations are naturally extended to human culture and society through diverse ways. The reason that Frankenstein does not continue with the creation of the female monster lies in his concern with the disaster that his creature would cause to future human society as well as about the propagation of the monster species. As shown in Frankenstein’s thought that “[s]he also might turn with disgust from him [the monster] to the superior beauty of man; she might quit him” (138), he worries about the potential disaster that the potential hybridity of man and the monster might bring about in the future. Similarly when he witnesses that Dr. Moreau creates hybrid creature – half human and half animal, Prendick feels at a loss what to do. After coming back to London, he realizes that the world is not any more what he used to

know. With incurable trauma, furthermore, he finds himself in a strange environment with different people and place, confessing “I can witness that for several years now a restless fear has dwelt in my mind,—such a restless fear as a half-tamed lion cub may feel” (138). The environment and culture change depending on the evolving interactions and interrelations that humans, living creatures, and surroundings have between them.

In a certain sense, Merleau-Ponty certainly seems to agree that humans are never completed living creatures yet because the body and the mind can influence each other in their own ecological interrelationship just like chemical materials in a beaker can change into different contents. For this reason, as “a form of radical biotic egalitarianism that locates value not in human beings but in ecosystems as an extreme biological equality, not giving value to humans but giving value to the ecosystem” (Carroll 299), deep ecology challenges the assertion of human’s wholeness by a belief in the change that may take place in all human bodies. Deep ecology emphasizes “self-realization and biocentric equality” (Devall and Sessions 205) in which the studies of “the interrelationships of culture and nature” (Davis 123) are important. However, as ‘natural selection’ and ‘struggle for survival’ in Darwin’s theory of evolution are also ecological principles immanent in nature and human society, there certainly is a biocentric *inequality* in evolution - a multiplicity of environmental struggles and changes that take place in the ecological interactions between organisms, between organisms and environments, and between cultural and social circumstances. From ecological and evolutionary perspectives, the phenomena of change and adaptation involve conflicts between individual entities or organisms.

Therefore, the foundations of ecological theory, as expressed by Merleau-Ponty, are not that different from those of evolutionary theory. As it were, evolution is an ongoing process of externalizing correlative conflicts between the individuals in nature and society in a certain form while ecology expresses the phenomena of conflicts between them and analyzes the present phenomenon. At this point, ecology is congruent with phenomenology – a study of a system of the concepts of seeing objects as they exist.

Based on these points about the body, it can be inferred that Jekyll and Moreau are obsessed with the transformation of human's or animal's body and psychology. This is because scientists have a stubborn passion to scientifically objectify and materialize the transcendental world of the mind beyond the real world of the physical body. As a result, scientists like Jekyll and Moreau, and evolutionary aesthetics theorists like Gray do nothing but to observe or reveal a natural phenomenon - the micro-ecological phenomenon occurring between body and mind in its chemical and evolutionary progress.

Gray reveals in *The Picture of Dorian Gray* that “Life is a question of nerves, and fibres, and slowly built-up cells in which thought hides itself and passion has its dreams” (182). He intricately associates the human mind activities with the bodily and biological organs, with emphasis on the micro-ecological and chemical interconnection and interaction between the mental and the physical. Other examples of chemical interactivity between the mental and the physical can be found in *Frankenstein, Dr. Hyde and Mr. Hyde, The Island of Dr. Moreau, and Invisible Man*. Interestingly, the

scientists in the works are all experts in chemistry. To make the creatures alive physically and mentally in the experiments, they have to find a chemical and ecological balancing point in their creature bodies to the extent that the physiological system of the nerves and fibres could be autonomously activated and operated well enough to keep the body and the mind functioning at their best.

Despite the lack of evident clues, Frankenstein uses his chemical knowledge and skill in creating the creature. Frankenstein says, “From this day natural philosophy, and particularly chemistry, in the most comprehensive sense of the term, became nearly my sole occupation” (32). For Dr. Moreau, “it is a possible thing to . . . to alter its chemical reactions and methods of growth” (75). Dr. Jekyll uses chemical reactions to invent the mysterious medicine so that his lab is messy, “the tables laden with chemical apparatus” (26). Griffin is a chemist who once “won the medal for chemistry” as a college student and he has employed “a quantity of chemicals to work out this idea of [his]” (122). Accordingly, these works suggest that there might be no other scientific ways of explaining the interactive phenomenon between the mind and the body other than by arguing that they could be chemically intermediated and interconnected through nerves and fibres. In that sense, it seems that the scientists’ experiments in the novels are intended to highlight the essential reality of the body and the mind by delicately articulating the collaboration of each of the physical and mental organs or by vivisection and rearranging the articulated parts of the body as if to reformulate the new organs and creatures. The scientists’ obsessions with the study of phenomena of life have brought to light the chemical and ecological reality of the function of mind and body.

Doubtlessly, the physical body itself exercises a powerful influence on human's idea and thought. Therefore, it can be argued from Merleau-Ponty's perspective that the social and cultural problems dealt with in the three novels more often arise in the diverse changes of the body because the epistemological and ontological changes have been made through or with the change in human body which is the starting and returning point of human's thought and consciousness. In a sense, he is implying that cultural change is written in the body and that it is the first sign that wider cultural transformations have occurred in the society. A close look at how the body is interacted with social and cultural factors in the stories will show cultural changes outside that body in a wider social and cultural context. As the Victorians made great advances in medicine, science, technology, arts, and capitalism, Victorian culture began to crack and change under the pressure of a lot of challenges from newly emerged areas whose axes were at the site of the corporeal body. Hence Frankenstein is dreaming of protecting human body from disease while seeking the principle of life, but the monstrous body is full of disaster, power, and terror. Jekyll wants to fulfil his violent and sexual desire by his arduous invention of transcendental medicine. Gray is challenging pursuing and justifying his atheistic, artistic, and sexual ideals while putting more value on the body than the mind. Moreau is changing the body while subsequently controlling the mind, and Griffith experiments with his own body for the goal of making his body invisible.

As may be noticed in the novels, at some times, the body seems to be an alluring, sensual, and sexual attraction. At other times, it exercises disastrous power and terror. In modern sense, the body is as much a scientific assemblage as it is a



scientific object in the laboratory. As a whole, however, each body functions as a role of the expression of evolving culture in private or public sects as it is a desiring machine, seeking, in Deleuzian terms, to ceaselessly change and evolve itself with others. What is noted here, then, is that the positive or negative social reception of evolutionary theory is externalized through conflicts between the body and mind of the characters in the novel. The evolutionary changes of the body depicted in the novels constantly challenge Darwin's belief that "evolution is constructive and humans are moving in an improving direction through this evolution wave" (Lombardo 42). Changes in the body in the novels are made to be regressive like that of the characters in the fiction: Gray who deteriorates himself into an old ugly man, Jekyll who turns into ape-like Hyde, the Elios who are weakly stunted, the Morlocks who are cruelly mutated, and Martians whose body evolve like an octopus. In the novel, regardless of the author's intention, the science and its development foreshadow regressive mutations.

## CHAPTER 6

### CONCLUSION: THE SCIENCE FICTION AND THE ANTICIPATION OF THE HYBRID FUTURE

This conclusion will analyze, through a discussion of Mary Shelley's *Frankenstein* and Aldous Huxley's *Brave New World*, how the manipulation of the human is made through the use of new technological advancements. Since we have actually reached a level today where the experiment and production mentioned in the novels can be carried out, the study of the process of the creation of life in the two novels anticipates many controversial points that have arisen in the field of bioethics. In this regard it is certain that the study of the Victorian novel or nineteenth century science fiction keenly anticipates what is still to come.

In the first part, after review of Katherine Hayles's definition of the posthuman, I will discuss what the posthuman future will hold in store for ecological bioethics comparing and analyzing between *Frankenstein's* monster and *Brave New World's* creatures. In the second part, reviewing what has been researched about Victorian science fiction, we will see what awakening and awareness is needed in the midst of an unpredictable evolution, with the advent of the GNR (Genetics, Nano-technology, Robotics) revolution, one which will not stop in the development of science even in the post-human age.

#### **Bioethics in Evolutionary Science and Culture**

The scientists and the humanists criticizing the kinds of unethical science exemplified in the stories in this dissertation began to express regret over the

undesirable direction of what appeared to be an unstoppable science. They thought that the consistent developments within the scientific field have made the scientists capable of crossing over into the creation of life, which could be considered to be an invasion of divine God's territory, as shown in *Frankenstein*. In that regards, from the multiple uses of technology to artificially create life arises the ethical and moral problems of bioethics.

The mission of a scientist is to find the principles of life and nature, and to find the ecological balancing point between the objects of life and nature, whether tangible or intangible, visible or invisible, physical or mental. Therefore, Frankenstein's research activity is fully understandable and his initial purpose and intention for the scientific research is desirable. He states, "I had begun life with benevolent intentions, and thirsted for the moment when I should put them in practice, and makes myself useful to my fellow-beings" (69). However, he is disgusted by his deformed creation, and feels threatened and distressed: "Unable to endure the aspect of the being I had created, I rushed out of the room" (39). When he has escaped far away from the monster, he uses the expression, "I am at length free" (42). Clearly, Frankenstein, as a scientist, is not taking full responsibility for the result he has achieved. His neglect of the monster causes grief and death to his family and friends, and it also brings troubles to the human world. It can be argued then that Frankenstein should have had a stronger sense of ethical responsibility for his experiments. The consequences of his disengagement from his scientific subject implies that the scientist must not stop at using the research achievement only for fulfilling his own curiosity but he must be ethically conscious enough to take responsibility for the subsequent consequences of

the results of the research. However, as a scientist, Frankenstein negligently abandons or releases a living creature that he has strenuously attempted to create for a long time. Without any reflection about the harm and danger that it may cause, he allows it to be exposed to the outer world and blames the cause of the consequent chaos on the ugliness, deformity, and dangerousness of the creature. This case represents a sample of the negligence of the scientist who does not recognize his bio-ethical responsibility and duty.

What should be emphasized more than the responsibility is that the scientific action should not be based on personal desires but rather on rational thoughts and needs. As Frankenstein says himself, the scientist should never lose composure when conducting research: “A human being in perfection ought . . . never to allow passion or a transitory desire to disturb his tranquility.” He confesses that even though “the pursuit of knowledge is an exception to this rule. . .if the study to which you apply yourself has a tendency to weaken your affections, and to destroy your taste for those simple pleasures in which no alloy can possibly mix, then that study is certainly unlawful” (37). This confession points out that too much desire can do harm to scientist’s ethical and moral decisions. In particular, this could be more true if the scientist cannot maintain “a calm and peaceful mind” and fails to maintain composure (37). If then, he tends to be prone to making mistakes in decisions, which will likely bring misfortune to humanity. Simultaneously, if he is dealing with a living thing, he would make fatal ethical errors. Thus, his confession highlights the fact that the scientist should keep momentary passions or desires under control, and then conduct research on the basis of earnest rationality. Ultimately, Mary Shelley spoke through

Frankenstein, when she advised to “Seek happiness in tranquility, and avoid ambition, even if it be only the apparently innocent one of distinguishing yourself in science and discoveries” (186) to express and re-emphasize the scientists’ proper research attitude.

The creature that Frankenstein has created is not recognized as a human of value and dignity because of the belief that human beings are the supreme creatures and the only subjects who can think. Given that the general criteria for distinguishing humans from animals are mostly language and thinking ability, Frankenstein’s creation is definitely human. Nevertheless, Frankenstein, as a creator, considers the creature as an inhuman being. As Peter Singer, a professor of bioethics at Princeton University, points out in *Animal Liberation* (1975), this type of bias is not difficult to find in the context of pre-existing sexism and racism. As “From the mere fact that a person is black or a woman we cannot infer anything about that person’s intellectual or moral capacities” (3), so no reason can be found for regarding Frankenstein's creature as a non-human being. Furthermore, Singer suggests that animals have thinking and linguistic ability with some degrees of variation: “Interestingly, this once neat dividing line between humans and other species has now been threatened by the discovery that chimpanzees can be taught a language” (13-14). Therefore, Singer recommends that the standards for distinguishing humans from non-humans should be changed and the definition of human-ness should be also changed. In this context, ““this principle of equality” . . . must . . . be extended to all beings, black or white, masculine or feminine, human or nonhuman” (Singer 5). Singer’s assertion is that discrimination between human and animal is no different from sexual and racial discrimination. Speciesism is an evil that should be abolished. By saying that we should “prove our

capacity for genuine altruism by ending our ruthless exploitation of the species in our power” (248), he would like to send out the message that we humans should show our true human-ness. Applied to the novel, although Frankenstein’s creature is perfectly humane in personality and intelligence, he is never given a name but simply referred to as daemon, monster, and creature. He is just a being that is regarded as nothing more or less than a disgusting animal. Therefore, his is a poor existence whose dignity and value are completely ignored. In this context, Frankenstein’s monster tells Frankenstein, “You propose to kill me. How dare you sport thus with life? Do your duty towards me, and I will do mine towards you and the rest of mankind” (77). In other words, he is asking Frankenstein to awaken from a torpor that blinds him to the dignity and importance of life for all species. It turns out that even if he succeeds in creating that life for the sake of fulfilling his desire as a researcher, a scientist’s lack of responsibility simply results in his toying with life.

Another reason why a bio-ethical problem occurs in Frankenstein’s research is because he makes a fatal mistake of omitting “all the steps” (34) necessary and because he is obsessed only with the result. For example, collecting body parts from tombs and dissecting rooms is unlawful and immoral. However, Frankenstein justifies his wrong behavior and tries to exempt himself from his guilty conscience by claiming that his attempt is to free humanity from disease. Despite his confession of “the magnitude and complexity of [his] plan” (35), he engages in hasty experiments. Therefore, he does not pay careful and moral attention to the process of collecting body organs for the excuse of creating a life that is equal to a human being. As the result, “contrary to [his] first intention” (35) of creating a life being that has a similar

bodily appearance as normal humans, he creates a huge, ugly human monster approximately eight feet in height. The problematic point is that the experiment is not bioethical and that the selection of materials for the experiment should have been more carefully made.

### **Ecological Bioethics of the Post-human Age in Science Fiction**

In *How We Became Posthuman*, Katherine Hayles asks herself what the posthuman is.

And she answers:

First, the posthuman view privileges informational pattern over material instantiation, so that embodiment in a biological substrate is seen as an accident of history rather than an inevitability of life. Second, the posthuman view considers consciousness . . . as an evolutionary upstart. . . . Third, the posthuman view thinks of the body as the original prosthesis. . . . Fourth, and most important, by these and other means, the posthuman view configures human being so that it can be seamlessly articulated with intelligent machines. . . . In the posthuman, there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals. (2-3)

To sum up, the posthuman is not what humans used to be as a biological being but “a thinking machine” with prosthesis body. Human consciousness is no longer to be regarded as “the seat of human identity in the Western tradition” (3). As Hayles clarifies, the posthuman body is composed of so many prostheses that any of them can

be replaced with others. Accordingly, Hayles' definition of the posthuman reminds us of Victor Frankenstein's creature and the artificially mass-produced creatures in Aldous Huxley's *Brave New World*.

As reviewed before, Frankenstein becomes invested in science by reading Cornelius Agrippa's work that discussed middle-age alchemy, specifically Albertus Maguus and Paracelsus' work in Geneva, Switzerland. Later on, he studies under M. Waldman and M. Krempe at the University of Ingolstadt and becomes its best scientist. With extensive curiosity about life and death, Frankenstein "delves into the dark side of nature" (30) and tries to free mankind from death and illness. Therefore, Frankenstein is often considered as "a definite example of a literary person who craved for knowledge" (Guinan 307). Mary Shelley imagines a young and ambitious Frankenstein who attempts to create life not by using middle-age alchemy, but through more modern methods made possible by scientific technology.

Frankenstein tries to achieve his dream of creating life by utilizing electricity instead of the unscientific method of alchemy. In particular, Frankenstein's view of "sacrificing life" (36) anticipates today's concerns with genetic engineering and human-cloning. This point is illustrated clearly in Huxley's *Brave New World*. The human creation process is conducted in the London Hatchery and Conditioning Center by using the Bokanovksy Process, whereby a human embryo is budded into hundreds of eggs, which grow into identical human beings in the artificial wombs of the Center. They are products created in order to realize its three mottos, "Community, Identity, Stability" (3). Therefore, Henry Ford's "application of mass production in biology" (7) becomes the basic element of happiness in the new world.



The infant production method in London Hatchery Center shows the inadequate concept of bioethics of this New World. The people of London in the novel believe that “Civilization is sterilization” (121). To them, the traditional method of reproduction is insanitary and disgusting. This phenomenon is reinforced by Freud’s argument about the dangers of family by emphasizing the instability and illogicalness of the role of a ‘father’ within society: “Our Freud had been the first to reveal the appalling dangers of family life. The world was full of fathers-was therefore full of misery; full of mothers-therefore of every kind of perversion from sadism to chastity; full of brothers, sisters, uncles, aunts-full of madness and suicide” (39). Therefore, Huxley’s society does not allow ‘family’ or ‘parents’ to exist. Even human reproduction is allowed by scientific means only.

Human’s endless craving for knowledge makes it possible to revolutionize the technological advancement to a point where GNR are all well developed. *Brave New World* shows us the final phase of this phenomenon. Human dignity and value are not important because humans are only considered “a cell in the social body” (90) and a part of social machine to stabilize the society. In the novel, their dead bodies are dumped into the factory and reused only as sources of fertilizers. The difference in epistemology between this novel and *Frankenstein* is great. *Frankenstein*’s world is based on anthropocentrism, so the monster is considered merely as an abominated sub-human, while the *Brave New World* supports technocentrism whereby human beings are nothing more than a part of a mechanism designed to ensure the stability of the system. Today, biological engineering endangers human value as much as it did in

*Brave New World*. Considering the developmental speed of scientific technology, the future world is most likely to shift into a completely different paradigm. Thus, in order to maintain the respect for human life as well as to develop scientific technology, bioethical concepts should be clearly established.

As bioethics provides the standards of ethical and moral actions in the treatment of a life form, Peter Singer published *A Companion to Bioethics* 1998 with Helga Kushe to suggest the basic direction for bioethical studies:

First, its goal is not the development of, or adherence to, a code or set of precepts, but a better understanding of the issues. Second, it is prepared to ask deep philosophical questions about the nature of ethics, the value of life, what it is to be a person, the significance of being human. Third, it embraces issues of public policy and the direction and control of science. In all these senses, bioethics is a novel and distinct field of inquiry. (Kushe and Singer 4)

It is intriguing to analyze *Frankenstein* and the *Brave New World* from Singer's bioethical point of view. The stereotypical judgment made by people upon seeing the monster of *Frankenstein* and the disregard of human life in the *Brave New World* specify the problems which lie within our society. Interestingly enough, Shelley is actually suggesting how to develop the code of bioethics of the modern society by excoriating the individual conduct of Victor Frankenstein and other characters within the novel. Similarly, the fact that after all the members in *Brave New World* die, they are consumed and then turned into raw materials for fertilizer at "Slough

Crematorium” (73) ascertains that the human dignity and the value of life are ignored in this world. That the God in the world is Ford, the founder of mass production, also shows that the society puts little value on the human dignity as humans are mass-produced as consumption goods for the safety of the society. *Brave New World* reveals the world unionized already with capital and power. In this world, the ideologies of “Ending is better than mending” (49) and “The more stitches, the less riches” (121) are brainwashed into the minds of consumers, which means the world is a capitalized society in which production and consumption are over-valued. The Bokanovsky method of baby production is not so different from the method of efficiency-based production which is the main reason for the cloning of animal and plant today. Therefore, Häyry’s opinion that “decision-making concerning the development of genetic engineering is at present controlled by multinational corporations rather than democratically elected governments” (152) is borne out by his prediction that the direction of development of biotechnology and genetic engineering will be influenced by colossal capital in the future. Even though natural science itself must be basically a pure study of exploring the principles of nature and life, the study is losing its pure motivation of the research as the applied sciences seem to mainly serve the purposes of consumerization, corporatization, and capitalization. For example, it is likely impossible to avoid producing designer babies, or cloned babies, or cyborgs or other imaginary beings through research concerning Human IVF (In Vitro Fertilization) for commercial purposes and periodic need. Häyry expresses his fear by comparing this situation with that of Huxley’s society:

When this development has gone far enough, scientists will also be asked to design special classes of sub-human beings who can do all those occupations which are too dangerous or too tedious for ordinary people. The outcome, according to the opponents of biotechnology, will be something like Aldous Huxley's *Brave New World*. (148)

The natural science itself is neither good nor bad, but something bad always occurs when it is misused. In that sense, *Brave New World* indicates that the direction of the future will be decided by the way in which humans will use science, and that itself will depend on what bioethics they possess. In turn, the success in the new area of biotechnology has no choice but to influence law and order of the society greatly. As John Harris states: "Spectacular biomedical success stories such as the birth of test-tube babies or the announcement of the discovery of the genes responsible for specific genetic disorders have sent governments and jurisdictions scrambling for basic principles which might illuminate the management of the legal, practical and human problems which inevitably follow" (216). This trend foretells not only the reform of the social system that will occur if planned biotechnology experiments succeed, but also the ontological and epistemological change that will be made in human life and society according to the needs of a post-human era.

Despite the portrayal of the young scientist Frankenstein who tries to create humans through scientific experiments, it seems that the foundation of the scientific theory which his experiments is based upon is meager and that the scientific process of creating the living creature is too abstractly described. Nevertheless, the interesting

thing is that his experiment exemplifies the medical concept of organ-transplant still used in the post-human era because, as shown in the novel, the extending or reviving of a patient's life becomes possible by transplanting the organs of others to a part of his/her body. Considering that *Brave New World* portrays a scientifically far more advanced world in which babies are mass-produced on a conveyor belt system and in which human intelligence and bodily function are operated and controlled from birth with specific purposes, the novel distinctively shows the post-human world in which humans are recognized purely in the light of information and mechanization. As in the *Brave New World*, humans are also engendered to be regarded simply as a rational thinking machine and as a small cell of a nation or a huge organization.

In the conclusion of *The Origin of Species*, Darwin mentions that "this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved" (267). His indication is still valid in this post-human era of the twenty first century when development of biotechnology is about to change the ontological state of human beings just as Darwin's theory did. In particular, the GNR revolution is certainly heralding the coming of the post-human era in which humans can be defined as an entity that combines Hayles's concept of 'post-human' and Haraway's concept of 'cyborg' in which humans are an "embodiment in a biological substrate . . . as an accident of history" (Hayles 2), "intelligent machines" (3), and cyborgs that are "a hybrid of machine and organism" (Haraway 149-50). Science and technology in the GNR revolution stage seem to activate by themselves already. According to Bill Joy, founder of Sun Microsystems, GNR technology would be a threat to human-kinds in

the twenty first century in the same way that WMD (weapons of mass destruction) related to nuclear, biological and chemical warfare threatened the world in the twentieth century:

It is most of all the power of destructive self-replication in genetics, nanotechnology, and robotics (GNR) that should give us pause. Self-replication is the modus operandi of genetic engineering, which uses the machinery of the cell to replicate its designs, and the prime danger underlying gray goo in nanotechnology. Stories of run-amok robots like the Borg, replicating or mutating to escape from the ethical constraints imposed on them by their creators, are well established in our science fiction books and movies. It is even possible that self-replication may be more fundamental than we thought, and hence harder - or even impossible - to control. (6)

As GNR-based technology can replicate knowledge and information by itself, Bill Joy warns of its increasing danger. Such a comment of Joy's intimates, as Francis Fukuyama does, that even though human history comes near to an end, "science and technology continue to evolve, and will soon make humans into posthumans, ushering in a new phase of history" (Abrams 252).

Such a radical social reform certainly requires scientists and social members to alter their perceptions about things. The difficulty and pain that Frankenstein undergoes in making a human monster can be symbolically interpreted as anticipating future attempts to make new human species or Cyborgs. Or his pains may imply

bioethical agony or concerns that scientists will likely feel in fulfilling the initiatives originating in *Brave New World*. The reason why the debate over bioethics takes place today is because people worry about the catastrophe that would come if the right choice is not made in the direction taken by science development. In other words, the source of such an anxiety is the concern that humans in the future would fall into “these less than human monsters” (Huxley 212) that John the Savage calls those people who lose ‘freedom,’ ‘emotion,’ ‘passion,’ and ‘love’ in the his new world. Contradictorily, the world controller Mustapha Mond, a former scientist, in charge of moral and ethics in the brave new world, prohibits the publication of a paper entitled “A New Theory of Biology,” claiming that “The author's mathematical treatment of the conception of purpose is novel and highly ingenious, but heretical and, so far as the present social order is concerned, dangerous and potentially subversive” (177). And he cuts it short, “Science is dangerous; we have to keep it most carefully chained and muzzled” (225). Mond thinks that subversive experiments and projects which make the society turbulent and unstable should be banned or controlled. Ironically, the controller’s attitude suggests indirectly the danger of insensible experiments of biology and biotechnology.

In term of Hukuyama’s ‘the end of history,’ the history of human-kinds should not be decided only by the impending necessity and need about whether the cloning of human organs should be allowed to cure human disease, for the experiments of adult stem cell, fetus stem cell, and embryonic stem cell have already caused immediate serious bioethical problems. Given the tendency towards self-interest, it is not difficult to see that the future of human-kinds could easily deteriorate into the Brave New

World imagined by Aldous Huxley. This concern was already raised in the nineteenth century by young Frankenstein's senseless experiments. The failure in creating the perfect living creature is the result that comes from human's senseless pursuit of knowledge and "the payment for stepping beyond the human boundary and extending human ingenuity beyond its natural limits" (Back 329). The world controller's remarks that "we can't allow science to undo its own good work. That's why we so carefully limit the scope of its researches" (227-28) signify that both *Frankenstein* and *Brave New World* deliver not only a concern about the insensible scientific works conducted in the area of biotechnology, but also a warning about the lack of bioethics in our society.

As can be seen in the analysis of *Frankenstein* and *Brave New World* from Singer's bioethical perspective, the researcher's crucial qualities required for the desirable research of biotechnology are a sense of responsibility, rational judging ability, respect of life value and human dignity, and recognition of the public interest of research. Furthermore, even though the research is executed by the scientists with these qualities, it is also necessary to review whether the research has ecological problems. Considering that a devastated ecological balance in a universal as well as a global context might devastate human life, dealing with even little living things like laboratory rats or insects in biotechnology research should be executed with the ecological bioethics that the value of the trivial animals are equal to that of humans. This is also the way to realize Merleau-Ponty's ecological ideas that the nature of things should be as much valued as that of humans because there ought to be no discrimination between all animate or inanimate things in ecological terms.



For example, Frankenstein's creature should not be otherized or called as devil, monster, or animal, but treated the same with a human. We can go even so far as to say that if a human is cloned, it should be respected as much as we are as soon as it has life. Otherwise, scientists today would make the same mistakes and errors that Frankenstein has made while not only avoiding the responsibility for the problems that he causes in making the new creature, but also monsterizing the creature because of his ugliness and deformity. Accordingly, well-established and desirable ecological bioethics will function as a guide by which the direction and destiny of researches and experiments in science and biotechnology will be seriously set in the right way. Without bioethics, people would have no way to avoid struggling through the pains and misery that Frankenstein and his people and the passive robotic mobs undergo in *Frankenstein* and *Brave New World*.

Unraveling the mystery of human life, biotechnology has been developing and extending the application of sciences enough to operate and control human life biologically. To fully optimize the possibilities of research, as shown in the discussion of *Frankenstein*, we should avoid both anthropocentrism in which humans are placed in the center of universe and technocentrism prevalent in the *Brave New World* in which humans are considered as simple cells. In the post-human era when very few of us can avoid science and technology in life, there is a high possibility that humans will be recognized as only one of innumerable living things existing in the universe as well as on the earth. Accordingly, the importance of bioethics in the post-human era will be highlighted in accordance with scientific developments. Science will require an ecological balance in the interrelationship between science & technology, nature and

the universe, and humans.

### **Awakening and Awareness: Evolution in the Post-human Age**

The problems that occur in the experiments in *Frankenstein* and *Brave New World* still remain as important problems to be solved. Fear of mutants caused by fertilized egg and somatic cell experiments in *Brave New World* is not that different from the fear raised by Frankenstein's creation of the monster. The production and cloning of somatic cells, which requires sacrifices of hundreds of somatic cells, are a big part of the bio-ethical debate. Religious and academic debates have swirled around the question of whether the use of the fertilized egg or grown fetus in research or medical treatment can ever be justified. It is claimed that this misuse greatly de-prioritizes the value and dignity of life. What should be emphasized here is the need for a strict neutralism in bio-engineering science. The neutral stance is one of the important things Singer emphasizes in order to realize the goal of bioethics in any kind of biological and medical experiments. Despite the significance of neutrality, although scientists are pursuing the goal of preventing people from illness and sudden death, they also have secular goals to make profits for private companies or corporations.

Although some of the bodily experiments dealt with in late nineteenth century novels were conducted by seemingly simple and non-scientific scientists, their attempts and experiments provided a discourse that anticipated similar human evolutionary ecological reasoning behind modern organ operations, amputations, transplants, and plastic surgery. As science and medicine actively intervenes and interferes with the human body and mind, so they may create a new form of body and mind. Ultimately, just like the effects of environmental shift on nature's physical

world, multiple scientific experiments are carved into the human body and mind in various physical methods, inevitably resurrecting the ecological conflict concerning the human form.

Jekyll's human experiments, Moreau's medical and biological animal experiments were made possible because of Stevenson's and Welles' scientific knowledge and even Wilde's evolutionary imagination. These authors were ahead of their time and inspired the twentieth century authors such as Aldous Huxley, George Orwell, and William Gibson in their writings about robots, cyborgs, and other substitute bodies.

Many of these novelists interested in scientific development approach the conception of a hybrid body based on change in human evolution which often has far-reaching effects. Phenomena of hybridization of human and animal, various transformation of body, and depictions of the future evolution of the human are examples of hybrid phenomena found in the works Victorian writers indicating how they understood ontological and epistemological changes. Today, the Genome project, discoveries of new genes and organisms, the complex correlation between organism and environment, and the concept of DNA combination and configurations may decide what we will become in the future. All of these experiments and discoveries are a threat to and warnings about changes in the current composition of human and human identity.

In the modern sense of science, scientific technology has reached the phase where the creation of life is possible through cellular and genetic manipulation. This amazing achievement is the result of humans' extensive scientific curiosity of the

mysteries and processes of life.

For instance, in 1978, the first Caesarean Operation was successfully conducted at the Oldham General Hospital in England in which a baby, Louise Brown, was created using IVF techniques. This success brought much hope and happiness to those who were diagnosed to be infertile. Furthermore, Dr. Wilmot's team's creation of the cloned sheep Dolly - the successfully conducted project at the Roslin Institute of Edinburgh of England - signaled that scientific technology had advanced to a point where the value and dignity of life was a subordinate concern. And many biotechnologists today are concentrating on human organ cloning by utilizing stem-cells. At this point, religious commentators and bio-ethicists became very concerned about the dangers and threats that the new technology could bring to human society, worrying about the possibility that it would decrease the respect for life, and leading them to establish numerous bio-ethics research committees.

And there are consequences for society in general. In *How We Became Posthuman*, Katherine Hayles claims that the cyborg is "an improved hybrid species that has the capacity to be humanity's evolutionary successor" (119). She asserts Harraway's claim of the cyborg as "fractured identities, the blurred and anxiety-inducing boundaries between human and animal, and between organism and machine, Simian, cyborg, and women" (Harraway 155). This statement is similar to Fiedler who talks about "species that straddle the line between us and our animal brothers" (Fiedler 168). In this, hybrid between machine and human or human and animal is creating a productive concept and identity which differ from how we traditionally value humans and animals. All these assertions suggest how the development of scientific technology

will contribute to the formation and transformation of a new society quite unrecognizable from the one in which we live now.

If to be post-human is to posit a human being supplemented by technology, the terminology trans-human can be used to describe a combination of human and machine with human emotions. Humans are moving beyond post-human and co-evolving into machines with integrated emotions. If the concept of hybrid is to explain the installation of machinery parts as appendages, it is extremely limited and does not come close to the range and width of scientific imagination materialized in Victorian era that provided a foregrounding of today's fundamental debate about the human body and changes in human identity. The contents of their writing anticipate current bio-scientific technology that allows genetic changes and alteration for producing new species. For example, the imaginative scientific experiments that Frankenstein, Dr. Jekyll and Dr. Moreau tried in fiction could be said to anticipate current molecular biology, which can subsequently change even the definition of what a 'human' is. This provides a very important thought for those who pursue the question 'what is it to live like a human being?'

Many of the stories discussed in this study have suggested worlds in which science and technology can make possible whatever human beings imagine. However, as the dystopian vision of the future in *Brave New World* suggests, unethical and un-bioethical development of science and technology, in return, may bring absurdity and irrationality to society, and the curiosity among scientists who try to clone humans as well as other living things leads to contemporary problems with biotechnology and biomedicine. The GNR revolution today also suggests that the concept of human

beings is drastically changing into a posthuman entity. In this situation, we cannot but rethink what and who the posthuman is. What I hope to have done is show how select Victorian fiction has anticipated the problematic future of a science-oriented society.

This study hopes to provide a valuable opportunity to rethink the recent crisis of humanity studies, caused by the assumed superiority of science and technology. Of course, humanity studies and culture should not be trivialized, but, in order to achieve this, we need to gain the genuine capability of thinking of the two cultures in consilient terms because we have to end the ever-present conflict between the two cultures. If we do not do this, science and technology will not bring wealth and happiness to the detriment of human dignity and value. I will argue that we have to study Victorian literature because it is the era in which a lack of conciliation between science and culture originated. Once we explore how literature articulates this conflict, then it is easier to articulate the future problems that our science and technology-driven society will face.

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