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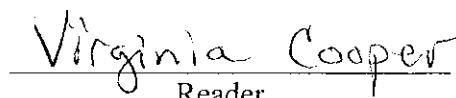


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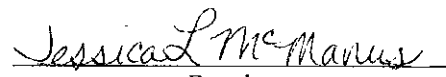


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Science Fiction and Models of Humanity

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Abstract:

Science Fiction as a literary genre offers a unique platform for social commentary. It presents plausible scientific advancements as a reality, and then uses this possible future to enter the discussion on society's current models of humanity. One of the first works of Science Fiction, Mary Shelley's *Frankenstein; or The Modern Prometheus*, published in 1818, was written in a time overflowing with new scientific theories and advancements. Two such sciences, galvanism and vitalism, aimed to identify the principle of life within the human body. At the same time, early psychological theories discussed the psychological aspects of what make us human, specifically emotional connection and sympathy. Shelley drew on galvanic, vitalist, and early psychological theories. Her model defines humanity by emotional expression, a capability for sympathy, and a basic desire to connect. Her novel has since driven more Science Fiction works to define humanity on innovative psychological levels.

One example is Kate Wilhelm's *Where Late the Sweet Birds Sang*, published in 1976. In the 1970s, the ethics of cloning and genetic control were highly debated. Wilhelm's novel creates a world where cloning is the preferred means of human generation, instead of sexual reproduction. Her model defines humanity less by biology, and more by individuality and a capability for original thought. Kate Wilhelm and Mary Shelley both use Science Fiction to present psychologically-focused models of humanity. This paper will compare and contrast how these two authors use science and psychological theory in representing life and drawing models of humanity.

Part I

*Frankenstein: Mary Shelley's Model of Humanity***Introduction**

Science Fiction as a literary genre offers a unique platform for social commentary. It presents plausible scientific advancements as a reality, and then uses this possible future to enter the discussion on society's current models of humanity. Mary Shelley's *Frankenstein; or The Modern Prometheus*, published in 1818, is often heralded as one of the first works of Science Fiction. As a founding text of the genre, it gives a springboard to future texts of Science Fiction by highlighting its key features. Carl Freedman writes, *Frankenstein* "contains every major formal characteristic that can reasonably be held to mark Science Fiction as a genre," (253). One of the marks of Science Fiction is that the science in the work must be plausible. *Frankenstein* draws on anatomy and chemistry, as well as proto-psychological theories of the time. Shelley does this by presenting and responding to scientific and psychological ideas circulating during the eighteenth and early nineteenth centuries. Vitalists and galvanists suggested an electrical 'vital force' that could reanimate human bodies. Shelley has Frankenstein create his monster through an act of galvanism. But Shelley does much more than that: she uses her narrative to explore what it means to be human. The creature may be centered in the 'other' chemically, but in terms of emotion and a need for human connection, the creature is more human than many other characters in the novel. By contrasting his 'otherness' with his 'humanness' Shelley makes her readers question what it means to be human. The proto-psychology that Shelley draws on argues that humanity is more than biological: it is defined by emotional expression, a capability for sympathy, and a basic desire to

connect. Shelley's definition of humanity on this deeper, psychological level is now a pillar of Science Fiction.

1. *Frankenstein's* role in the establishment of Science Fiction

What is the definition of Science Fiction as a literary genre? In his article, "Hail Mary: On the Author of *Frankenstein* and the Origins of Science Fiction," Freedman points out that while Science Fiction has no singular definition, it can be summarized as: "(explicitly and implicitly) offer[ing] imaginings as well within the possibilities of cognitively based speculation as established by the most advanced science of the day" (255). In other words, Science Fiction (SF) creates a world that does not exist today, but one that is nevertheless based on the current scientific theories of the author's time, and so *could* exist one day. The events that unfold are well within the realm of the possible. This is the line that separates works of Science Fiction from works of realistic fiction or fantasy. A SF novel "is grounded in that literary terrain of rational possibility" (256). And since the story is within a possible future, the author is able to comment both on where the culture is and where it could be headed. Additionally, in doing so SF texts often warn against specific scientific endeavors because of the implications they could have for our society and culture.

Science Fiction is important to culture and the future of science because it doesn't prompt the reader to engage in the 'how' of scientific processes, but to engage in the 'why and why not.' Freedman uses the term "cognitive estrangement" to describe how texts build a new world in the reader's mind and urges them to engage in the events of that new world. About *Frankenstein*, Freedman writes,

... Its first readers must have regarded the monstrous creature very much as we regard Asimov's robots. They would have strongly doubted that any actual scientist had yet done what Victor Frankenstein is represented as doing. But they would surely have wondered whether some experiment of the sort might not be in the offing, and they would have hesitated to contradict Darwin (the most influential scientific popularizer of his day) by considering it "of impossible occurrence." Estrangement is a literary technique as old as Gilgamesh. But truly cognitive estrangement begins with Frankenstein. (256)

"Cognitive estrangement" leads the reader to an unfamiliar place and encourages them to interact with it. The 'what if' is made more real because the author has laid it all out for the reader. What if a scientist were able to create life? What if the scientist then rejected his creation? Shelley presents this possible future for readers to engage with and ask more 'what ifs.'

Shelley's possible future in *Frankenstein* is made even more potent given that it was the first major story of 'human' creation not requiring the participation of both man and woman, or help by some godly power. Shelley's idea was the first of its kind of cognitive estrangement because no other authors before Shelley had created a world harboring a creature with such an origin. In her article, "Making a Monster," Anne Mellor states: "*Frankenstein* invents the story of a man's single-handed creation of a living being from dead matter. All other creation myths... depend on female participation or some form of divine intervention... The idea of an entirely man-made monster is Mary Shelley's own" (38). Due to its originality, *Frankenstein* has permeated culture in plays, poems, and movies since its publication. Shelley's interpretation of humanity has grown

in prominence and acceptance because of *Frankenstein's* widespread fame. *Frankenstein* was the first to open the door to Science Fiction and its new creations of humanity and the implications that inevitably follow.

2. The sciences behind reanimation

In order for *Frankenstein* to be a work of Science Fiction, the scientific events in the novel must be theoretically possible given the sciences of the time. The eighteenth century was bursting with scientific experimentation and advancement. The key question many of these scientists were asking was: what is life and what creates life? They were searching for a definitive principle of life, chemically and biologically. The scientific implications of the existence of a tangible force as key to life implicitly challenged the religious explanation that an intangible, spiritual force is the source of all life.

Frankenstein can be read as a critical explanation of the scientific search for the principle of life.

The influence of lecturer Humphry Davy, a Professor of Chemistry, is evident in Shelley's text. Her father, William Godwin, took Mary to several of Davy's public lectures when she was fourteen years old. The impact of these lectures can be found in Shelly's depiction in the novel of M. Waldman, Frankenstein's Professor of Chemistry. The ideas that Waldman impresses upon the young Frankenstein are of the grandeur of discovery in chemistry, and the capabilities of chemists in unfolding the mysteries of the world: "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 earthquake, and

even mock the invisible world with its own shadows” (Shelley 49). Holmes explains that these elaborate truths were reminiscent of the lectures of Davy that Mary Shelley was brought to in her youth (326).

In contrast to Davy’s theory of chemistry and its potential in the manipulation of nature, Erasmus Darwin’s observational science offered Mary Shelley an example of scientific discovery without natural disruption. Erasmus Darwin studied fossil remains and other natural evidence and presented some of the first theories of evolution, long before his grandson Charles Darwin would become famous for a further development of such theories. In “A Feminist Critique of Science,” Mellor argues that E. Darwin “provided Mary Shelley with a powerful example of what she considered to be ‘good’ science, a careful observation and celebration of the operations of all-creating nature with no attempt radically to change either the way nature works or the institutions of society” (95). While Davy’s chemistry urged the use of science to alter nature, Darwin merely observed and theorized. He in no way encouraged the manipulation of other creatures and their biological forms, dead or alive.

One of Darwin’s concepts of evolution that most influenced *Frankenstein* is his theory of a hierarchy of reproduction. Also in “A Feminist Critique of Science,” Mellor states that in almost all of his works, Darwin insisted that “sexual reproduction is at a higher evolutionary level than hermaphroditic or solitary paternal propagation” (97). Creatures that reproduce sexually, between a male and female, are “the most perfect orders of animals” (qtd. in Mellor 98). All beings who procreate in a manner other than sexually are lesser beings, according to Darwin’s hierarchy of reproduction. Darwin also believed that “the *male imagination* at the moment of conception [was] responsible for

determining both the sex of the child and its outstanding traits” (Mellor 98). He then believed that the sex of the baby, along with any birth defects, were a product of the male imagination. So, by Darwinian standards, Frankenstein is both creating a being that is doomed to be lesser because it was not created through sexual reproduction and because it was ‘born’ in Frankenstein’s imagination. Percy Shelley’s mention of Darwin in the Preface to *Frankenstein* points to the impact Darwin’s theories had on Mary Shelley as she both conceived and wrote her novel.

But more than theories were necessary to birth Frankenstein’s creature. One science, known as galvanism, was Shelley’s key to making *Frankenstein*’s vision a literary reality. Galvanism is named after physiologist Luigi Galvani who, in 1802, became known throughout Europe for his experiments in ‘reanimating’ parts of animal corpses. In “A Feminist Critique of Science,” Mellor discusses Mary Shelley’s critique of science’s unethical leanings towards experimentation. She explains that, in galvanism, reanimation was done by attaching wires to copper and zinc plates, and then placing the now electrified end of said wires to different body parts in corpses (104-5). Galvani based his experiments on his assumption that there is an “electric fluid” created by the brain and transmitted through the nerves to the muscles and tissues of the body (104-5). This “electric fluid,” or “animal electricity,” was believed by Galvani and his followers to be the source of life. It was called the “innate vital force” that lived electrically in all human and animal tissue (104).

Galvani believed this “innate vital force” was the secret to reanimating life, and his followers took his theory even further in more astonishing experiments. One such Galvanist was Professor Luigi Aldini. On January 17, 1803, Aldini applied Galvani’s

methods onto the corpse of a criminal, murderer Thomas Forster, who had been hanged an hour before. The result was a series of experiments and galvanic manipulations at a much higher power than any other, which gave “an appearance of re-animation” (Aldini, qtd. in Mellor “Feminist Critique” 105). Aldini continued to conduct experiments of the like on human corpses throughout 1803-1804, during the most notable of which:

The bodies of human corpses became violently agitated and one even raised itself as if about to walk; arms alternately rose and fell; and one forearm was made to hold a weight of several pounds, while the fists clenched and beat violently the table upon which the body lay. Natural respiration was also artificially re-established and, through pressure exerted against the ribs, a lighted candle placed before the mouth was several times extinguished. (“Feminist Critique” 106)

It would be impossible for these experiments to go unnoticed, and so Aldini’s work quickly became known and replicated throughout Europe. Seeing the money that could be made from public displays of Aldini’s galvanism, many of his followers jumped at the opportunity to publicize their own versions of Aldini’s study. The public spotlight on these experiments continued to swell until 1804, when use of decapitated criminals’ heads for Galvanic experiments was finally forbidden in Germany and Prussia (Mellor “Feminist Critique” 106). With the widespread publicity, it is almost certain that Shelley was aware of the events. Percy Shelley, Mary’s husband and a famous poet, was most likely referring to such experiments in the preface he wrote for *Frankenstein*: “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 11).

In her introduction to the 1831 edition of *Frankenstein*, Mary Shelley acknowledges Galvanism's key role in creating the concept for the story. She read about "the nature of the principle of life," and thought, "perhaps a corpse could be re-animated; galvanism had given token to such things: perhaps the component parts of a creature might be manufactured, brought together, and imbued with vital warmth" (8). While little is explicitly stated about the specifics of Frankenstein's creation of the creature, galvanism is undeniably the method. When the day comes to accomplish his task, Frankenstein says, "I collected the instruments of life around me, that I might infuse a *spark* of being into the lifeless thing that lay at my feet" (Shelley 58; my emphasis). "Spark" is an intentional reference to electricity and the galvanic method. This mirrors Mary's ponderings on reanimating a lifeless, constructed body, and highlights her use of galvanism as Frankenstein's creature's principle of life. And that the "instruments of life" are all "around" Frankenstein emphasizes the supposed materiality of a life force, one that could be physically, tangibly pieced together.

Galvanism was one of the first sciences to introduce a theory of a "vital force," but it was not the only one. Professor John Abernathy of the Royal College of Surgeons in England thought that this electric force was instead found in the blood. In his chapter "Dr. Frankenstein and the Soul," Holmes describes how Abernathy believed the blood was the key because blood was responsible for so many other important motions of the human body: "pulses of the heart, circulation of the blood, healing inflammation, male erection, and female blushing," to name a few (309). Abernathy "was entranced by the possibility of the voltaic battery," located in the blood, "and its possible connections with 'animal magnetism' and human animation. Electricity, in a sense, became a metaphor for

life itself” (Holmes 309). In his discourse on the physical sources of the life force, Abernathy came close to a materialist theory of life. However, Abernathy was convinced that the “Life Force” was a “subtle, mobile, invisible substance” that was “superadded” to “animal matter” (qtd in Holmes 309). His description thus straddled the physiological and spiritual aspects of the “life force.” He ultimately insisted that the fundamental “life force” could not be reduced to a tangible substance. This idea helped rectify Abernathy’s conflicts of religion and science, because this “Life Force” was theoretically the human soul that had been placed within us by some almighty power. To Abernathy the soul was not a tangible substance, but others disagreed.

Abernathy’s star student, who had grown to become a professor of anatomy in his own right, believed that Abernathy’s theories of the soul were just that: theories. They were unprovable in scientific study and therefore could not be given the merit of scientific findings. William Lawrence believed only in what could be proven within the realms of scientific study: “that there is no such things as a mysterious Life Principle, and that the human body is merely a complex physical organisation” (qtd. in Holmes 312). In other words, he believed that the human body—and the “life force” that animated it—was more functional, mechanical, than spiritual in composition. It is not that Lawrence did not believe in the existence of the human soul, but that “the theological doctrine of the soul, and its separate existence, has nothing to do with this physiological question... An immaterial and spiritual being could not have been discovered amid the blood and filth of the dissecting room” (qtd. in Holmes 313). Unlike Abernathy, Lawrence argued that the presence of an invisible soul is a religious belief and scientifically unprovable and should therefore be kept “wholly independent” or separate from “the world of scientific

research” (Holmes 313). This dissonance between the ideas of Abernathy and Lawrence exemplifies the key conflict in the search for a material source of life. It began to be debated whether finding such a substance was even possible: is “life a matter of mere physiology? Are humans fundamentally just biological materials? Or is there more to “life,” and were scientists failing to show that about human life in their focus on the material aspects?

This debate over the existence of a physiological life force, known as Vitalism, was a prominent subject of discussion between Mary Shelley and Percy Shelley. The head of one end of the argument, Lawrence, was, coincidentally, Percy Shelley’s physician. Between 1815 and 1818, Percy Shelley regularly sought medical consultations from Lawrence, often accompanied by his wife Mary Shelley. Percy Shelley, like many other poets and artists of the time, was inspired by the public Vitalism debate, and, according to Holmes, it was “Lawrence, with his unusual knowledge of French and German experimental medicine, who helped turn the Shelleys’ joint scientific speculations along a more controversial path” (311). Due to Percy Shelley’s connection to Lawrence, combined with the notoriety of the galvanic experiments, Vitalism and galvanism became highly influential in Mary Shelley’s writing *Frankenstein*. Her novel actively engages with the “controversial path” of Vitalism and the question of a “life force” being re-imbued into a body. She uses it to grow her model of humanity beyond biological factors.

Frankenstein’s creation is not simply a material entity, but a being with feelings and intellect capable of empathizing with others, and craving that deeper, immaterial connection. Mary Shelly suggests that what makes him human is not that he has the

material aspects of human life, but that he has a need beyond the material and is driven to emotionally connect with others. Mary Shelley shifts her focus to the proto-psychology of human identity, not physiological components.

In the text, Shelley argues that while the material “life force” has clearly been re-imbued in the creature’s physical body, he is not innately “human.” At his birth, Frankenstein does not see a human being, but rather a “demoniacal corpse” (59). The creature is not immediately human upon his re-animation. Both Frankenstein and the creature describe the beginnings of his life in purely physical terms: “muscles and joints rendered capable of motion,” is how Frankenstein describes him (59); the creature says that in his first memories, “a strange multiplicity of sensations seized me... and it was, indeed, a long time before I learned to distinguish between the operations of my senses” (105). He is a living being from that moment on, but has only obtained “life” physiologically, not “humanity.” Galvanism is able to imbue a material life force, but the creature’s humanity is not imbued, rather developed with experiences and human connection. He experiences emotions like pleasure in watching his neighbors interact (111). He learns language and morals first by observation and imitation of other people, and then through the texts he reads, like Milton’s *Paradise Lost* and Plutarch’s *Sorrows of Werter* (130). Through his experiences with other humans he learns to sympathize and strives to connect. Mary shows the reader his growth and formation of morality and sympathy as the story progresses, suggesting that he was born with a blank slate of a “life” that is molded by his experiences. At first, he was a living being but not a human; he could eat, sleep, breathe, but not think and judge and connect with others. What makes

him human are these psychological developments of showing and understanding human emotion and sympathizing and craving sympathy.

Connection with others was also important for Mary Shelley in creating her novel. Conversation and speculation were imperative in Mary's Shelley's combining all of these scientific ideas and utilizing their influence in the shaping of her story and characters. Mary and Percy Shelley had numerous conversations about psychology and creating artificial life. Holmes states that, "When Mary eloped with Shelley to France and Switzerland in 1814, their shared journal indicates that they were already discussing notions of creating artificial life" (326). Also of note, while they were sailing back from their elopement they were talking about "the monstrous, inhuman appearance of several of the huge German laborers on board, and noticed that they sailed beneath a lowering *schloss* known as 'Castle Frankenstein'" (326). This memory of a mental association between monstrous figures and the name Frankenstein could very well be where Mary Shelley conjured the name of her diabolical scientist. After their return, Percy Shelley wrote several essays that combined scientific ideas with those of psychology: "On the Science of the Mind," "On a Catalogue of the Phenomenon of Dreams," and "Of Life" (326). Again, it is obvious that he talked to Mary Shelley about his ideas and his works as in one journal entry Mary "remembered on one occasion how he broke off from writing one of them, 'overcome by thrilling horror'" (326-327). His reaction is highly similar to Mary's description of when Frankenstein first meets his creation: "I started from my sleep with horror...I beheld the wretch—the miserable monster whom I had created" (59).

All these scientific theories, galvanism, Vitalism, chemistry, evolution, and psychology, came together for Mary Shelley through discussion with others, like her husband and their close friend Lord Byron. During a conversation between the three about these sciences and their recent discoveries, “they then, famously, set themselves a ghost-story-writing competition” (Holmes 327). Through this competition, and a waking dream Mary Shelley has about a creature with yellow eyes looking towards its creator with an intense gaze, *Frankenstein* is born.

3. Theories of identity

At the time of *Frankenstein*'s writing, many theories of human identity were circulating. Since the creature's conception, 'birth,' and early days are different from any being before him, Shelley would need to have an understanding of these theories of identity in order to develop the creature's identity as 'human' and 'other.' Two prominent theorists of development at the time were David Hartley and John Locke. Literary critic Anne Mellor discusses their ideas in her article, “Making a Monster.” Mellor summarizes:

The associationist David Hartley argued that early sensitive experiences determine adult behavior, and the rationalist John Locke concurred that natural man is neither innately good nor innately evil, but rather a white paper or blank slate upon which sensations write impressions that then become ideas or conscious experience. (48)

Hartley believed that childhood experiences were deeply impactful on the rest of a person's life. Locke's theories are similar, but begin farther back, before birth. He stresses the importance of the fact that humans are born “blank slates,” or devoid of any

inclination towards being good or evil, and the world around us creates our ideas and experiences, molding us.

The ‘infancy,’ or first several days, of the creature’s life exemplify Locke’s theories of sensation and development. During what the creature terms, “the original era of my being,” he is first overwhelmed by his senses and has no understanding of them: “A strange multiplicity of sensations seized me, and I saw, felt, heard, and smelt at the same time; and it was, indeed, a long time before I learned to distinguish between the operations of my various senses” (Shelley 105). He is a “blank slate,” as Locke suggests, and has no understanding of the world around him. He experiences “light, darkness, heat, cold, hunger, pain and pleasure,” and all the while he has no understanding of them, only experiences them (Mellor 48). The creature says, “No distinct ideas occupied my mind; all was confused” (Shelley 106). This is evidence that he is born with no leaning towards good or evil, because he has no conscious decisions towards one or the other upon birth. His experiences later guide him towards his development of either good or bad morals.

Hartley’s theory that early experiences influence adult behavior also plays a role. When the creature is born, unlike most people, there is no father or mother figure to guide and protect him while he learns about the world. His mind begins functioning after he has left Frankenstein’s lab, so he ‘awakens’ alone. This loneliness echoes throughout the novel. Once the creature learns about his environment through his observations of the De Lacey family, he realizes that he is indeed lonely. Where the De Laceys have a father figure, he has none. Not only is he without a father but he is continuously *rejected* by Frankenstein, his atypical father. The realization of this causes him to reflect upon his

own life, and so his first experiences of being, which occurred alone and rejected, taint the rest of his adulthood and his feelings towards Frankenstein in the rest of the novel.

The De Lacey family is where the creature first learns language, and this process echoes another theory of Locke's. Locke asserted that "children learn best from examples," which is exactly how the creature learns language (Mellor 49). He listens to the words spoken between the family members, and by following the actions associated with different sounds, the creature learns what words are and what objects they refer to. After he learns words for objects, he grows to understand words for more abstract concepts. For example, the creature quickly and easily learns "milk," "bread," and "wood," simply by watching the De Lacey family work (Shelley 115). He can distinguish words like "good" and "unhappy," but does not fully understand them. But by watching the Father De Lacey read, the creature can discern "he found on the paper signs for speech which he understood" (116). Then as the De Laceys teach Safie to read, the creature also learns. And once he understands language, the creature can learn about more complex ideas, like virtue, affection and injustice.

In understanding language, the door has been opened for the creature to learn more deeply and quickly by reading. In "Making a Monster," Mellor argues that, "the creature's excellent education, which includes moral lessons garnered from the two books Locke thought essential, Aesop's Fables and the Bible, is implicitly contrasted by the faulty education received by Victor Frankenstein" (49-50). As the creature elaborates on his moral development through reading, the reader can contrast the creature's experiences with those of his creator. Mellor notes, Victor grew up reading "books which encouraged, not an awareness of human folly and injustice, but rather a hubristic desire for human

omnipotence, for the gaining of the philosopher's stone and the elixir of life" (50). While such an education ultimately leads Frankenstein to construct his creature, the reader is given the impression that, given Locke's theories, the moral virtue of the creature has been given a better foundation than that of the creator.

Psychologically speaking, the understanding of language is part of what makes us human and without it we cannot truly define ourselves as 'human.' In her article, "Frankenstein on Language and Becoming (Post)Human," focusing on *Frankenstein's* presentation as human within language, Felice Cimatti says that, by learning the "public language," or the language of the community around him, the creature is giving himself an opportunity to connect. "A body becomes human," she says, "when confronted with a pre-existing human (and linguistic) community" (12). Joining this community through language could potentially fill his identified loneliness. However, in order to be recognized, a being must have a name for what he is. And the name must be something that is a recognizable word within public language, or else no one will understand and be able to connect with him. This is where Frankenstein should come into play, as the creature's 'parent.' A child needs a parental figure to tell the child how to recognize itself, because, "the infant needs to go out from [it]self in order to self-recognize" (13). A parent acts as the bridge in this stage of development by telling an infant, "this is you," when they look into a mirror. "Victor Frankenstein's refusal to recognize "his" creature," Cimatti continues, "condemns the nameless "monster" to be a humanoid body without identity" (13). Without a name for what he is, which can only be bestowed upon him by his creator, the creature cannot be identified as 'human,' and therefore cannot connect with the De Lacey family, or any other 'human' being in the novel.

While this theory of the “social and linguistic mirror” was not a theory of Shelley’s time, it is theorized to be an unconscious understanding of language we all have (10). So, Shelley may have been unconsciously aware that in presenting a creator who fails to name his progeny, the creature would never truly be given an identity as ‘human.’ Within today’s culture, “it is significant that “Frankenstein” is popularly believed to be the creature’s proper name; its name would be the name of its creator, that is, the name of he who refused to give to the creature a proper name. There is no other name for it. Since it properly does not exist as human being, it cannot be named with a proper name either” (Cimatti 12-13). We are compelled to give a name to something that has had such a large impact on our culture, and yet we still have no word to define the creature’s being besides the surname of its creator.

In summary, learning the language develops the creature’s identity by inserting some form of a “self” for him into social relationships, and we see natural, innate ability in the creature to develop cognitive, affective, social awareness. Unfortunately, this only leads to the creature’s deeper awareness of his alienation from all others and a stronger drive to be connected to other human beings. However, without “recognition” by another human, full development of identity within the community and within himself is blocked. His natural capacities prompt him towards sociality, the repeated failed attempts at connection turn the creature’s leaning towards sociality into frustration, rage, and violence.

The theories of identity of her time, like those of Hartley and Locke, were influential in Shelley’s development of the creature’s identity. So was an unconscious understanding of the importance of language in human development and how a name

impacts human identity. Her execution of his growth from “blank slate,” to experiencing sensation, to reflecting back on his first experiences clearly demonstrate Hartley and Locke’s theories. While his lack of a name is intentional, Mary Shelley may not have consciously known the theory behind a name’s importance to identity.

4. Theories of sympathy

Once Shelley used Galvanism to give the creature life, how was she to define his life as ‘human’? The key for Shelley was emotion and sympathy, based on philosophical theories circulating in the eighteenth century. David Hume and Adam Smith were prominent philosophers in Mary Shelley’s time. Literary critic Seth Lobis discusses theories of sympathy, like those of Hume and Smith, in his book, *The Virtue of Sympathy: Magic, Philosophy, and Literature in Seventeenth-Century England*. Hume and Smith both developed theories on the transference of human emotions. Hume was the first of the two, teaching that, “the passions are so contagious that they pass with the greatest facility from one person to another, and produce correspondent movements in all human breasts” (Hume, qtd in Lobis, “Future of Sympathy” 301). Whenever we feel an emotion, through sympathy, those around us or those we are closely related to may then have the impression of feeling that emotion too. In other words, sympathy is “the transfer of sentiments from one rational being to another” (Lobis, “Future of Sympathy” 298). Lobis explains,

For Hume, the experience of sympathy depends on, and confirms the fundamental truth of, relation. Our lively ideas of others’ passions and the ease with which they are converted into “the very impressions they represent” depend on the relations of resemblance and contiguity; we are so similar to other human beings and are

often so close to them—in space, “blood,” or “acquaintance”—that we readily sympathize with them. (299)

The “fundamental truth of relation,” means that those who are more similar to us or more often around us more easily get impressions of our emotions. Hume believed that how closely a person is related to another is marked by the ease of sympathy.

Frankenstein, as the creature’s father, is arguably the being who should be most able to sympathize with him. They are arguably most “related.” Such a parallel of “sympathy as a principle of “genetic” connection,” Lobis later argues in the “Coda” of his book, Shelley draws as similar to that of Milton’s *Paradise Lost* (315). When the creature attempts to sympathize with the De Lacey family, he finds “[him]self un-sympathized with,” because of his appearance and differences from them (Shelley 118). This further asserts that Frankenstein is the only being the creature can hope to sympathize with. But where such a connection is a form of redemption in *Paradise*, notes Lobis, “Shelley narrates no such redemption, ultimately suggesting that Frankenstein and his creature have nothing more than a mystical connection” (315). And even then, Frankenstein’s ability to sympathize with the creature is limited by his own physical, unconscious reactions to him. Frankenstein thinks of the monster and “My abhorrence of this fiend cannot be conceived. When I thought of him, I gnashed my teeth” (95). Similarly, when Frankenstein decides not to create a companion for the creature, it “gnashed his teeth in the impotence of anger” (172). The sympathetic connection between the two is present in the parallel of physical reactions, as sympathy may involve the transfer of negative emotions as well as positive ones.

But Frankenstein severs the sympathetic connection between the creature and himself before it can develop further. When the creature tries to invoke sympathy in Frankenstein through the telling of his story, Frankenstein thinks: “His words had a strange effect upon me. I compassionated him and sometimes felt a wish to console him; but when I looked upon him, when I saw the filthy mass that moved and talked, my heart sickened and my feelings were altered to those of horror and hatred” (149). The creator will not let himself acknowledge the creature as human, and something possible to sympathize with; he only sees a “filthy mass that moved and talked.” Frankenstein is disgusted by what his work has become. His disgust prevents any deeper, positive emotional sympathy between the two of them.

Philosopher Adam Smith took Hume’s theories a step further by drawing a larger connection to human society as a whole. This connection may be why the reader is able to sympathize with the creature even while Frankenstein will not. Smith theorized (qtd. in Lobis), “Because of the reality of human uniqueness, there can be no perfect echo or reflection of “original” emotion, and so we engage in a process of mutual accommodation... We strive to harmonize with others, and the harmonies that we produce, however imperfect, produce a larger harmony, “the harmony of society” (307). The reader cannot see “the filthy mass” that Frankenstein claims the creature to be. We are more readily given the creature's thoughts and feelings, and as members of human society, we reflect upon its emotions and “harmonize” with them. We, similarly, strive to connect, and so it is easier for us to sympathize with the creature, who craves connection, than the creator, who continually “tried to stifle these sensations” of sympathy he may feel (149).

The creature has an innate ability to sympathize with characters in books and with people, and desperately wants someone to sympathize with him as he does with them. When he reads Plutarch's *The Sorrows of Werter* and is confronted with the possible death of the hero, "[he] wept, without precisely understanding it" (131). He is able to connect and share the emotions of the characters even though he does not fully understand their predicaments. And as he observes the De Lacey family he sympathizes with them: "benevolence and generosity were ever present before me, inciting within me a desire to become an actor in the busy scene where so many admirable qualities were called forth and displayed" (131). The De Lacey family sympathizes with each other, and continually demonstrate kindness throughout the novel. By watching their small acts of sympathy, the creature builds his capacity to sympathize with people. The creature's sympathy leads him to perform altruistic acts for those he sympathizes with. For example, the De Lacey children often suffered in silence while they give their blind father all the food they have: "They often, I believe, suffered pangs of hunger very poignantly, especially the two younger cottagers; for several times they placed food before the old man when they served none for themselves" (114). Upon witnessing acts like this, the creature says, "this trait of kindness moved me sensibly," and compels him to help in the only way that he knows how while remaining hidden: leaving piles of firewood for the family in the night (114). He is continually moved by them, and often mirrors their emotions: "when they were unhappy, I felt depressed; when they rejoiced, I sympathized in their joys" (115). The longer he observes the De Lacey family the more capable he is of sympathy, and the more he craves a sympathetic connection from others. This is what ultimately leads him to reveal himself to the family. Unfortunately, due to

his hideous appearance, the introduction arouses fear and blocks sympathy, and the creature flees to find his creator in the hopes of Frankenstein creating a mate for him. He recognizes that the absence of resemblance is what is continually blocking mutual sympathy with others, and so his last resort is to ask Frankenstein to create someone who resembles him, who is the most related to him, and would present the ideal person for him to finally connect with.

Since Hume and Smith's theories began widely circulating at the end of the eighteenth century, they became a frame of reference that often guided reflection on key works of literature, including Shelley in her framing of *Frankenstein*. Milton's text, *Paradise Lost*, preceded both Hume and Smith but similarly highlights the importance of sympathetic connection: "It has been generally accepted...that Frankenstein is deeply informed by Mary Shelley's reading of Milton," because *Paradise* is one of the main texts the creature reads and learns from (Marshall, qtd. in Lobis "Coda" 315). The protagonist in *Paradise* has a strong resemblance to the creature: both are rejected by their 'father,' both are not innately evil but perform more evil acts following negative treatment/rejection from others, and both are strongly depicted as the "other" within their stories. The continuous suggestion that the creature could gain sympathy if others were more related to him or resembled him serve as strong embodiments of Hume and Smith's theories of sympathetic connection. The "Romantic theories of physiologic sympathy" have a presence that cannot be denied in *Frankenstein*.

5. Who is more human, creator or creation?

In using all of these scientific and philosophical theories of her time, many critics have argued that Shelley presents the creature as implicitly more 'human' than

Frankenstein, his creator. There are two main ways Shelley does this: through contrasting psychological parallels, and through differences in the language used by the main characters.

In terms of psychological parallels, the creature craves human connection, while Frankenstein appears repeatedly to “shun” it (Shelley 56). In his article, “Shelley’s Frankenstein,” on the humanizing techniques used in Shelley’s novel, literary critic Jim Coleman points out that “throughout the winter, spring, and summer” (22), when creating his progeny, Frankenstein “shunned [his] fellow-creatures,” and goes so far as to “forget those friends who were so many miles absent” (Shelley 40-41). He easily disregards companionship for the selfish purposes of his experiment. Quite the opposite, Coleman states that, “the monster (also during the winter, spring, and summer) delighted observing the De Lacey family “through a small chink” (110) between his “hovel” and their adjoining cottage. He regrets the necessity of his self-enforced social distance because “joy had taken the place of sadness in the countenance of my friends” (121)” (22). The creature craves companionship in any form, even if it’s just through proximity, as with the De Lacey family. This desire for human connection makes the creature appear more human than Frankenstein. Not only does the creature show more sympathy towards others, but he is driven to continue sympathizing in any small opportunity presented to him. In contrast, Frankenstein shows no such inclination towards sympathy.

The monster also seems more human than Frankenstein in the amount of effort he exerts for personal growth. The only pursuit Frankenstein actively strives for is the creation of his monster, and it is a solitary endeavor with ideal rewards meant for him alone: “a new species would bless me as its creator and its source” (Shelley 55). Then,

upon finding it to be not what his narrow-minded view of a slave-like being should be, Frankenstein's goal shifts: "now that I have finished, the beauty of the dream vanished, and breathless horror and disgust filled my heart... Unable to endure the aspect of the being I created, I rushed out of the room..." (58). When the creature confronts him, asking for a companion, Frankenstein is so disgusted by the possibility of two monsters, let alone one. His goal then changes to destroying the creation that was once his only pursuit, which again is a solitary endeavor. In her article, "The Monster's Humanity: Racism and the Foreigner in *Frankenstein*," about the creature as a representation and challenging of British opinion of foreigners, literary critic Melanie Friese surmises that, "Victor does not exert effort to find love, to pursue a different passion, or to live a good life; his whole life becomes consumed first by his creation and then by his obsession to destroy it" (92). There is no sign of effort towards growth in Frankenstein.

The creature, however, demonstrates not only the ability to learn and grow, but also the drive to do so. Friese says, "the creature has hopes, dreams, and ambitions that he pursues with conviction, such as obtaining a companion to love and trying to find his place in the world" (92). In fact, these passions are the driving forces behind almost all of the creature's actions in the novel. He knows what he wants, and he actively shows growth in order to get closer to obtaining it, despite repeated rejections along the way. And the goals the creature strives for are what make him more 'human' emotionally, in spite of his "otherness" physiologically. The creature is made to appear more human than Frankenstein in the subject of his desires, and in his personal growth in pursuing them.

Conclusion

Mary Shelley's *Frankenstein; or The Modern Prometheus* is often heralded as one of the first works of Science Fiction because it represents and responds to scientific ideas circulating at the time of its publishing, and weaves in proto-psychological ideas as well. While it is astonishing to think that Mary Shelley was only nineteen years old when she began writing it, there is no doubt as to why the ideas came to her. Mary is known to have discussed galvanism, chemistry, evolution, psychology, and the philosophy of sympathy and identity with her husband, Percy Shelley, and her close friends. Through the inspiration of discussion, and one ghost-story-writing contest, Mary Shelley's creates her own model of humanity beyond biology. Shelley defines what it is to be human as: a depth in emotional expression, a capability for sympathy, and a basic need and desire to connect. Shelley makes *Frankenstein's* monster psychologically 'human' through these standards, despite his physiological 'otherness.' Her original idea of humanity continues to resound through culture and Science Fiction.

Part II

Where Late the Sweet Birds Sang: Kate Wilhelm's Model of Humanity

Introduction

Science Fiction offers a unique platform for authors to present and discuss how we, as a society, define our humanness. In Part I of this paper, Mary Shelley's *Frankenstein* was discussed as one of the first works of Science Fiction to demonstrate a definition of humanity based more on psychology than biology. Shelley urges us to delve into our core desire to connect: This is what defines her model of humanity, based on the sciences of her time. More than a century and a half later, Kate Wilhelm's novel, *Where Late the Sweet Birds Sang*, looks at the potential futures the sciences of the 1960s suggested. Three main areas guide Wilhelm's writing: climate change theories, conceptions of cloning, and psychological theories of identity. Utilizing the moral dilemmas these topics entail, Wilhelm challenges and expands our concepts of humanity as both empathetic and individualistic. Wilhelm's novel is placed in a future where climate change has made humanity infertile, and cloning becomes the primary means of reproduction. Her characters, both human and clone, are conflicted between their desire to connect and their desire to protect individuality. Wilhelm creates a commentary on the model of humanity of her present day, suggesting that what makes us human is a balance among individuality, empathy, and creativity.

1. Climate change theories of the 1960s-1970s

When Wilhelm was writing *WLTSBS*, human-caused climate changes, and global warming in particular, were highly debated. In fact, since 19th century geologists uncovered evidence of the ice ages (Weart 68), scientists have been interested in

understanding the causes and effects of global climate fluctuation. In his article, “The idea of anthropogenic global climate change in the 20th century,” Spencer Weart outlines the evolution of scientific thought that led to what we now call global warming. Weart writes that the early 20th century marked the beginning of the first hypotheses regarding the chemical composition of the atmosphere:

Minor constituents like water vapor and carbon dioxide gas (CO_2) had been found to intercept heat radiation. Theorists pointed out that the result would be what later came to be named (misleadingly) a ‘greenhouse effect,’ an obstruction in the outflow of radiant energy that keeps the planet’s surface warmer than it would be without an atmosphere. (68)

In other words, scientists theorized that an increase or decrease in the amount of water vapor and carbon dioxide present could make our climate run hotter or colder. Since the discovery of the ice ages was still prominent, researchers, like Swedish physical chemist, Svante Arrhenius, began to make calculations of the effects of cutting the CO_2 in half (68). Scientists were generally more engrossed in understanding the recent ice age discovery, and less so with their current, seemingly stable atmosphere.

However, the rare few were looking for modern implications to studying water and CO_2 levels. Weart highlights one physical chemist in particular: “a colleague, Arvid Högbohm, brought Arrhenius a strange new thought. Högbohm had calculated that human factories and other industrial activities were adding CO_2 to the atmosphere at a rate that was comparable to the natural processes” (68). Once Högbohm realized this, Arrhenius changed his tactics, and “attempted to calculate the consequences of doubling the CO_2 in the atmosphere, and in 1896 announced it would raise the Earth’s temperature some 5–

6°C” (Weart 68). Since this was merely speculation, and the grasp of the mechanics of our atmosphere was limited, researchers saw no cause for concern. Overall, this increase in temperature didn’t seem consequential to most scientists. Weart theorized that with control and maintenance of our CO₂ output, “we might someday be able to regulate the planet’s temperature to suit our needs” (68-69). In 1910, the idea was dropped because it seemed impossible to many scientists that something as great as the entirety of Earth’s weather could be altered by humanity. On this assumption, Weart states: “This dismissal of any human influence was part of a larger conviction that all of biology was irrelevant to the global atmosphere” (69).

From 1910 to the 1940’s, numerous researchers brought findings of increasing concern to light, but were continuously dismissed. In the 1930s, a “warming trend” was noted in parts of the world, but this was widely disregarded as simply part of climate cycles that would presumably return to normal (69). Concern was finally sparked in the 1940s, when an English engineer named Guy Callendar meticulously gathered atmospheric CO₂ measurements conducted by scientists over last century, and concluded that the CO₂ levels had risen by as much as 10% in as little as one hundred years (Weart 69). According to Weart, “This, [Callendar] insisted, was the cause of the observed warming, and the warming would increase in future centuries as fossil fuel emissions continued” (69). What further accentuated his point was that Callendar had nothing to gain from this evidence; his work was “done for no compensation but the pleasures of science and in defiance of conventional opinion” (Weart 69). Callendar conducted his study merely out of his passion to prove that there was indeed a problem on the global horizon.

With Callendar's findings prevalent in people's minds, a significant change in thinking was brought about with the use of nuclear energy in 1945: "Suddenly nothing seemed beyond human power" (Weart 70). In the 1950s, mass media and Science Fiction writers suggested that this climate alteration could be easily manipulated, and in numerous works of Science Fiction climate alteration was viewed as a tool of war:

Experts speculated that we might soon be able to use salvos of atomic bombs to control the weather. At the same time, scientists warned that a nuclear war could destroy civilization if not all life on the planet. No matter whether technology could turn deserts into gardens, it could demonstrably turn gardens into deserts! Impacts could be global: opponents of nuclear armaments pointed to the horrors of radioactive fallout drifting invisibly everywhere. From about 1953 until open-air nuclear testing ceased in the mid-1960s, many in the public blamed the faraway tests for almost any unseasonable heat or cold, drought or flood. (Weart 70)

Speculations on the reality and control of such climate weapons birthed new questions regarding the governability of such power, and its inevitable misuse. If technology could be developed to control the worldwide climate conditions, what would be stopping governments from using this technology to wage wars?

By the 1970s, humanity's effect on our environment was no longer an ignorable fact. Atmospheric scientist J.S. Sawyer published his famous scientific analysis in 1972, "Man-Made Carbon Dioxide and the "Greenhouse" Effect." Sawyer stressed that man's impact could no longer be written off because, "in spite of the enormous mass of the atmosphere and the very large energies involved in the weather systems which produce

our climate, it is being realized that human activities are approaching a scale at which they cannot be completely ignored as possible contributors to climate and climate change” (Sawyer 23). It had long been assumed that the mass of the world and its overall climate was too vast for humanity to have an effect on it. However, because of the obvious toll nuclear bombs in the 1970s had on the environment, and how long their effects lasted, the human capability for global destruction was no longer doubted. Sawyer summarized the main factors of global climate change as “certain minor constituents of the atmosphere which have a particularly significant effect in determining the world climate. They do this by their influence on the transmission of heat through the atmosphere by radiation” (23). Those three factors are carbon dioxide, water vapor, and ozone. Through the research of many other scientists, people were discovering that “the quantities of these substances are not so much greater than the products of human endeavor that the possibilities of man-made influences can be dismissed out of hand” (Sawyer 23). Science had supported the claim that burning fossil fuels was adding large amounts of carbon dioxide to the atmosphere, and while the hole in the ozone layer would not be discovered until the mid-1990s, research was also finding hints of ozone depletion. Water vapor played a key role as well: Greater snow and cloud cover reflects more solar radiation away from the earth’s surface, resulting in a lower global temperature range. Therefore, Sawyer argued that all three of these human-influenced factors (carbon dioxide, water vapor, and ozone), while seemingly small, could drastically change the world’s climate.

Sawyer’s thoughts on how seemingly minor factors could change the atmosphere so much led to more research on humanity’s rates of air pollutants, but the large numbers

scientists found were made less terrifying by the idea that man could easily counter these problems. The mentality brought on by the nuclear bomb, where the godlike power of humanity could not be overlooked, generated a hopeful assumption that man could just as quickly and effectively generate a solution. Physicist John Holdren and biologist Paul Ehrlich asserted that this was not the case. Their premise: it all comes down to the availability and the depletion of resources. Since the age of industrialization, the human population has been growing at alarming rates. This called for mass production of food and other resources to support the growing population. However, the planet's resources were not meant to naturally replenish fast enough for such a harvest. According to Holdren and Ehrlich, "civilization tries to manage ecosystems in such a way as to maximize productivity, "nature" manages ecosystems in such a way as to maximize stability, and the two goals are incompatible" (284). By attempting to maximize the productivity of our environment the food production industry has had to adapt its methods in ways like monocropping or "replacing complex natural biological communities with relatively simple man-made ones based on a few strains of crops" (285). But by making crops easier to mass produce, we have also made them more fragile: "they are vulnerable to invasions by weeds, insect pests, and plant diseases, and they are particularly sensitive to extremes of weather and variations in climate," more so than the more complex biological communities that came before them (Holdren and Ehrlich 285). The world has set itself up for failure. Holdren and Ehrlich emphasize that the new methods can support the growing population, but the system is more susceptible to threats like climate change; the very threats not-so-distantly looming on our horizon due to increased air pollution. A small hindrance could send the whole system tumbling

down. Holdren and Ehrlich use the Irish potato famine as “perhaps the best-known example of the collapse of a simple agricultural ecosystem. The heavy reliance of the Irish population on a single, highly productive crop led to 1.5 million deaths when the potato monoculture fell victim to a fungus” (284). Becoming too heavily reliant on a fragile system will almost undoubtedly lead to catastrophe.

Another problem: the ultimate effects of climate change may only be fully realized after it is too late to reduce or avoid them. Holdren and Ehrlich saw the potential for this lag in the effects pollutants, ranging from radiation to pesticides, to hinder our efforts to combat them:

Unfortunately, time lags of these sorts usually mean that, when the symptoms finally appear, corrective action is ineffective or impossible. Species that have been eradicated cannot be restored. The radioactive debris of atmospheric bomb tests cannot be reconcentrated and isolated from the environment, nor can radiation exposure be undone. Soil that has been washed or blown away can be replaced by natural processes only on a time scale of centuries. If all use of persistent pesticides were stopped tomorrow, the concentrations of these substances in fish and fish-eating birds might continue to increase for some years to come. (291)

In summary, if humanity were, miraculously, to cease the burning of fossil fuels all in one day, the negative effects would continue for several more years, at least. The nature of the climate is that it does not respond immediately. Like evolution, change takes significant time to take hold. The amount of pollution in the atmosphere would still rise for a time before it leveled off and then decreased. If pollution does not decrease soon

enough, Holdren and Ehrlich suggested, such an amendment would still not keep us from the tipping point between a habitable environment and an uninhabitable one (291).

Wilhelm's grasp of these climate change theories is evident in *Where Late the Sweet Birds Sang*. The way that Wilhelm sets up the environmental conflict in the novel is a distinct mix of all of these theories: nuclear climate affects, monocropping hindrances, and the concealed of the effects of pollutants over time. Grandfather Sumner gives a detailed monologue to David, the main character of the first section of the novel, that outlines all of the problems humanity has been experiencing:

The pollution's catching up to us faster than anyone knows. There's more radiation in the atmosphere than there's been since Hiroshima... We reached zero population growth a couple of years ago, but, David, we were trying, and other nations are getting there too, and they aren't trying... The famines are here... and they're getting worse. There's more diseases than there's ever been since the good Lord sent the plagues to visit the Egyptians. And they're plagues that we don't know anything about... There's more drought and flooding than there's ever been... Entire species of fish are gone, just damn gone, and in only a year or two... Every damn protein crop on earth has some sort of blight that gets worse and worse..." (20)

All of the issues Grandfather Sumner outlines suggest humanity has passed its point of no return for global pollution. The population is no longer increasing because the resources needed to support it are being reduced drastically. The monocropping of foods like "protein crops" has hindered them to the point that all are experiencing "blights" and there are no reserve crops to draw on. More than plants, the wildlife is being affected by

the pollutants, so much so that “entire species of fish are gone,” and there’s no way to get them back. All of this is evidence that the world is at its breaking point.

As Grandfather Sumner’s warning continues, Wilhelm focuses in on a common theme with climate change theories: “There have been hints here and there that this is a major concern, but who listens? The damn fools will lay each and every catastrophe at the foot of a local condition and turn their backs on the fact that this is global, until it’s too late to do anything” (20-21). Like Holdren and Ehrlich, the main characters in the novel (namely—Grandfather Sumner (the family patriarch), as well as uncle Walt, the other uncles, and David and his father) recognize that it is in the nature of society to deny the problem as long as possible, especially one as daunting and haunting to realize as global climate catastrophe. They, however, acknowledge the problem and start to prepare for the worst. They build a hospital, a lab, and pool their familial resources to have the best chances of surviving the impending climate catastrophes. Wilhelm uses the effects of climate change as the exposition; while it is important in setting up the story it is unsolvable for the characters. The Sumner family will not grapple with climate change directly; instead they will be isolated by it. Wilhelm presents the family as the only ones willing to take precautionary measures for their survival, while the rest of the world will deny the problem until it destroys them.

As climate change shreds their last bits of hope, a new idea emerges for humanity’s survival: the family must resort to cloning or risk extinction. Cloning, as a science, is fraught with moral and emotional potholes that would make ethical scientists wary of the endeavor. Wilhelm must create an environment where cloning is the only means for humanity’s survival. Similar to climate change, there is an acknowledged

inevitability to cloning if the family, and humanity as a whole, is to survive. Wilhelm's use of climate change as a driving force within her story suggests her stance as supportive of climate change reality and action to be taken in regard to it, sooner rather than later. However, climate change is not the primary conflict, but rather the catalyst pushing the main characters into exploring and embracing cloning. As exemplified by the history of climate change theory, science often takes time and numerous experiments supporting a theory before it is accepted as truth. In the novel, humanity is not given the time to test their theories and weigh the results; There is a minefield left uncharted regarding cloning and its effects, but climate change urges the Sumner family to rush its cloning efforts regardless of the risks. They must discover as they go and stake their last hopes of survival in a morally fraught course of action.

2. Cloning in Science Fiction

Wilhelm's adaptation of climate change theory into novelistic reality creates a world where even humanity is being changed by the climate alterations, and not for the better. The pollution in the environment is making all animals, including humans, sterile: "There was no child left under eight years of age when the spring rains came," the narrator tells us (27). Since the family had already been investing time and energy into cloning animals, and the cloned lines were continuously resulting in sterility. When, after several strains of cloning, a strain of mice is finally found fertile enough to sexually reproduce, all hope seems not lost. And as they test all the men and determine that, "no man in the valley was fertile," their cloning innovations must be put to the test for the continuation of the human species (30). In this way, by using climate change as a cause

of sterility, Wilhelm sets up a platform for investigations into cloning as the last foreseeable means for humanity's survival.

In the early 1970s, when *WLTSBS* was being written, cloning had not yet been accomplished, and would not be until the cloning of Dolly the sheep on July 5, 1996. However, three developments suggested not only cloning's possibility, but its inevitability. First came research on the duplication of cells, and the implications of such biological progress. Second, Science Fiction not only sparked the ethical debates on cloning, but even inspired congressional attention, prompting potential laws to stop cloning before it ever fully began. And third, the success of In Vitro Fertilization lit fears of cloning on fire in a whole new way.

In essence, cloning involves the removal and placement of cell nuclei in order to create genetically identical beings. Michael Goldman, a literary critic, who believes cloning is "not intrinsically evil" but usually involves mixed motives, discusses cloning and its implications in his 1998 article, "Human Cloning: Science Fact and Fiction." Goldman defines cloning as referring "to the production of an individual organism (a sheep or a human) by removing the nucleus from an unfertilized egg (oocyte) and inserting the nucleus from a somatic or body cell, then allowing development of an organism to proceed" (106). This process is also referred to as "somatic nuclear transfer," and the organism that develops after the process is "genetically identical to the individual from which the somatic cell nucleus was obtained" (106). One of the earliest attempts at cloning dates back to the 1950's. John Gurdon and his colleagues attempted to make a frog that was identical in genes to the donor parent. Gurdon's research team took nuclei from frog eggs and put them into the cells of young frogs. There was little, if any,

success. However, Gurdon did come to a significant conclusion: the younger the original “donor frog,” the more likely the process was to be successful (107). “This suggested that as organisms mature, somatic cell nuclei progressively lose their “potency,” or ability to direct development of an oocyte into a complete organism,” and Goldman states this as why “the most dramatic and significant applications of cloning by somatic nuclear transfer are those in which the donor cell was derived from an adult” (107, 106).

Goldman’s article was written and published after the success of Dolly the sheep’s cloning in the 1990’s, but Wilhelm would have only known about Gurdon’s frog experiments. Since Gurdon’s experiments suggested the plausibility of cloning, but not that such science at the time was even close to capable of such a feat, the human cloning that Wilhelm generates in her novel would have been even more extraordinary.

While scientists recognized that the science of cloning was still in its early developmental stages, geneticists recognized the bioethical debate sparked by endeavors like Gurdon’s. John Marks outlines the development of cloning up to Dolly and beyond in his article, “Clone Stories: Shallow Are the Souls That Have Forgotten How To Shudder.” Regarding the bioethical debates in the 1960s and 1970s, Marks summarizes:

The geneticist Joshua Lederberg inaugurated a bioethical debate on human cloning in a 1966 article in *The American Naturalist*. Lederberg predicted that human cloning would facilitate eugenic practices based on the successful combination of sexual and clonal reproduction in the field of horticulture. He viewed cloning, or ‘clonality’ as he called it, as being simply a technological extension of human endogamy: ‘Leave sexual reproduction for experimental purposes; when a suitable type is ascertained, take care to maintain it by clonal

propagation. Other commentators were not quite so sanguine. In 1972 James Watson published an influential article entitled ‘Moving Toward the Clonal Man: Is This What We Want?’ In 1971 Watson suggested the possibility of a worldwide ban on human cloning in anticipation of technological developments. In general terms, the 1970s were marked by a growing realisation of the potential impact of biotechnology, which was emerging in the 1970s, and cloning was a way of talking about and dramatising the emerging field of bioethics. (Marks 335)

Science Fiction, influenced by the bioethical articles of Lederberg, Watson, and other speculative scientists, spawned novels that embarked further into the cloning dilemma and its possibilities. Throughout the 1970s, numerous Science Fiction works were published with cloning at the center, creating realistic thought experiments where cloning shapes our world, and asking readers to engage with the ethical boundaries of such potential realities.

This huge outpouring of works and novelistic discussions, and the call from numerous scientific articles to confront the impending seriousness of cloning and its proposed impacts on our society, gained the attention of the U.S. Congress. In 1972, the Library of Congress was asked to complete a study on the current status of genetic engineering, including (but not limited to) cloning (Annas 251). In his article on the history of cloning and why clones are doomed to be lesser than the original, George Annas discusses why the early outcries like these were both taken seriously and disregarded. The report from the Library of Congress concluded that cloning was “not now possible,” but overall called for “assessment and detailed knowledge, forethought and evaluation of the course of genetic developments, rather than “acceptance of the

haphazard evolution of the techniques of genetic engineering [in the hope that] the issues will resolve themselves” (Annas 251). The call for thorough “assessment” never fully occurred; however, Congress’s attention to the issue, however brief, further spurred new Science Fiction works about cloning.

Because *WLTSBS* was written during the early 1970s, following the Library of Congress’s report, the essence of where the debate stood at the time can be seen in the novel’s clonal elements. The specific phrasing used in the Library of Congress’s report about the “haphazard evolution of the techniques of genetic engineering” could be a fitting way to describe the development of cloning in the novel. Due to the fearfully motivating of global climate change, the Sumner family begins cloning in a last effort to keep humanity alive as a species, once sexual reproduction fails. However, as it is developed, the process could overall be a metaphor for how society in the 1970s regarded cloning: a taboo topic no one talked about, yet everyone knew its reality was just on the horizon, or in the case of the novel, in a cave just below their feet. As David fosters the growth of his experiments, moving from focusing on animals to humans, he is forced to bring more of the family members into the fold to work on the projects. Because of speedy development of the cloning equipment and systems, many of the family’s methods are not as high quality as they could be: “like everything around here, the generating system had bugs in it. We can store enough power for no longer than six hours, and we don’t let it go out for more than six hours. Period,” David tells Celia in the first section of the novel, upon showing her the innovations they’ve been forced to develop (Wilhelm 42). And because David knows that people will be able to ethically accept cloning animals, but not humans, “In every room except the one where human

clones were being grown, people were working” (31). “They never used a Bunsen burner or a test tube before, but they have become scientists and technicians practically overnight,” David states, “and thank God for that, or it never would have worked. I don’t know that they think we’re doing now, but they don’t ask questions. They just do their jobs” (31). Wilhelm, like many other Science Fiction authors at the time, recognized the tone being set by the cultural climate around cloning at the time. People didn’t want to acknowledge or discuss the increasing reality of cloning due to its taboo nature as a topic. However, science would continue advancing until cloning was achieved. In a way, *WLTSBS*’s depiction of cloning encapsulates the atmosphere of the cloning discussion in the early 1970s. While the bioethics were being debated, scientists were actively working towards making cloning a reality, regardless of the risks.

All that was brewing with cloning and its realities in Science Fiction wasn’t completely being ignored by the U.S. government, but particular attention was not paid to cloning again until two years after *WLTSBS* was published. Two events triggered the government’s attention once more: David Rorvick’s novel *The Cloning of Man*, and the first successful birth from artificial insemination. First, *The Cloning of Man* created a debate because of its content: The novel claimed to be the true story of a wealthy man and how he used his resources to find a scientist willing and ultimately able to clone the wealthy man his own heir. What piqued so much interest regarding the novel was how the story was represented: as a factual account. According to Annas’s recounting of the events, “Six years later, in 1978, a subcommittee of the House Committee on Interstate and Foreign Commerce held hearings on human cloning in response to the publication of David Rorvick’s *The Cloning of a Man*” (252). Annas highlights, “all of the scientists

who testified assured the committee that the account of the cloning of a human being was fictional and that the techniques described in the book could not work” (252). However, scientists claimed cloning was impossible in part to protect their ability to pursue further study: “The major point the scientists wanted to make, however, was that they did not want any laws enacted that might affect their research. In the words of one, “There is no need for any form of regulatory legislation, and it could only in the long run have a harmful effect”” (Annas 252). Rorvick, like other Science Fiction authors, appeared to have written the novel as a factual account to create an opportunity for U.S. society to face the ethical dilemmas of cloning as it applies to the real world. Unfortunately, because it was written in such a factual manner, its goal did not quite hit the mark. Instead, discussions on the novel centered more around the novel’s supposed fictionality rather than its purpose as a bioethical thought experiment:

Unfortunately, the ensuing public debate on cloning centered not on the ethical issues but on whether or not the book was a hoax. This, of course, missed the point. The book was an elaborate fable and presented a valuable opportunity to discuss the ethical implications of cloning. The failure to see it as a fable was a failure of imagination. We normally do not look to novels for scientific knowledge, but they provide more-insights into life itself.” The issues Rorvik unearthed were quickly reburied. (Annas 252)

Instead of finally approaching the discussion points around cloning and its implications, the congressional committee was focused on whether or not the events in the novel had come to pass. Overall, they missed their chance to get ahead of the curve on the cloning debate.

Amid the popular debate on Rorvik's work, the first successful birth from In Vitro Fertilization was announced. Louise Brown was born in 1978, the product of In Vitro Fertilization (a female egg fertilized outside of the female body) and artificial insemination (the fertilized egg was placed into a female womb). This first success of the procedure marked a turning point for human reproduction, as well as hope for people who struggled with infertility for a variety of reasons. This also marked a turning point in who we as a culture consider the parents of a child. Annas remarks that, since the success of this project, "a child can have at least five parents: a genetic and rearing father, and a genetic, gestational, and rearing mother" (253). The traditional concept of parentage was challenged.

Although the success of In Vitro Fertilization and the debate over Rorvik's novel both occurred two years following Wilhelm's novel (*WLTSBS* was published in 1976, while *The Cloning of Man* wasn't published until 1978), they represent the events and discussions that were brewing during the writing of *WLTSBS*. While the ideas culminated in 1978, they were topics for discussion, speculation, and Science Fiction inspiration throughout the 1970s. The tension surrounding cloning is clear in *WLTSBS*. When Walt announces "tomorrow, ladies and gentlemen, we will have our own babies" developed through cloning, the response is: "there was a moment of utter silence, of stillness, then they broke... For the next three hours they questioned, argued, prayed, formed alliances, reformed them as arguments broke out in the smaller groups" (50). The moral turmoil that David and Walt have grappled with envelops the community. There is fear that "they might organize... they might form a committee to protest this act of the devil. We'll have to be ready for them," says Walt in response to the community's reaction. However,

David and Walt know that the community will be forced to accept the necessity of cloning because their other options for survival quickly dwindle. After the first round of babies is born, “the first visitor Walt permitted in the nursery was Clarence,” the strongest party against the clones, but after seeing the babies “there was no further talk of destroying the inhuman monstrosities” (51). The community is not completely comfortable with it, but it knows that cloning is humanity’s only means of survival. For the continuation of their race, and their family specifically, they begrudgingly accept the new practice. In choosing to frame her story in this way, Wilhelm suggests an inevitability to cloning. She is implying that science will advance and find success with cloning right under our noses, whether we like it or not. The part we do have a say in is how we as a society respond to it.

3. Psychological theories of identity

The novel establishes the groundwork for the science of cloning, the clones are created, then Wilhelm uses the rest of the novel to dive into the psychological aspects of clones. If the clone is the same biologically as the original, then the differences can be found in their life experiences and understandings of the world around them. Two main abilities distinguish the clones from the original humans: the clones empathize and seem to silently communicate with others in their birth group, and they crave human connection only with others of the clone community. On the other hand, the originals think and act individually and creatively. These are the two scales that all characters in the novel fall on that ultimately lead to their survival or downfall. The original humans, born through sexual reproduction, think too individually, leading to the pollution of the world and, almost, the extinction of humanity. The clones, on the other hand, are highly

connected emotionally and psychologically, so much so that they go insane when they are too separated from their clonal siblings. Too much of a good thing is not a good thing; the balance of individuality and connection is key. Mark, the main character in the end of the novel, represents a balance between empathy and individuality, which is necessary to fostering a lasting humanity.

To create a character such as Mark and portray him as a whole, unique individual, Wilhelm draws upon ideas from humanistic psychology. Humanistic psychology was founded by psychologist Abraham Maslow in the 1960s (Buhler). The field was developed in response to two main theories of human nature in psychology circulating at the time. The first, behavioristic psychology, studies human behaviors that are measurable and focuses on looking at human actions to measure and define human nature (Maslow 686). The second, known as psychodynamic psychology, or Freudian psychology, focuses on conscious and unconscious emotions and behaviors and how they affect one another (Maslow 686). Maslow, who developed humanistic psychology as a third type, explains: "Third Force psychology, as some are calling it, is in large part a reaction to the gross inadequacies of behavioristic and Freudian psychologies in their treatment of the higher nature of man" (686). According to Charlotte Buhler, in her article "Basic Theoretical Concepts of Humanistic Psychology," the mistake of the first two theories was that, "in following the example set by modern science, the individual was always studied as a member of a group, and the study of one individual alone was not considered to be an object of science" (Buhler 378). This meant the individual was only considered in so far as their behavior in, towards, or as part of a collective. All aspects of the person were not analyzed.

Humanistic Psychology instead attempts to focus on the individual as a whole, unique, separate being, not just as a member of the broader collective of humanity. It does this primarily by focusing on a person's experiences and getting them to the point of self-realization. "The self-realization process," Buhler states, "is essentially the experience of bringing values to materialization" (381). By analyzing our experiences, we recognize how our common values are materialized in our lives, how they came to be our values, and how we are shaped by and are shaping them. One of the central keys self-realization is creativity and the potential for change:

Creativity as a central concept of humanistic psychology has still another significance. More than any other behavior, it is a manifestation and evidence of the new, generally accepted theory that the living being and especially the human brain represent an open system with certain freedoms of operation and potentials for change. (Buhler 383)

People who have reached higher levels of self-realization have more capability for creativity, as they have recognized their values and know that they are not stagnant beings, but rather growing, changing, and being molded through their awareness of their experiences and actions.

Maslow asserts that each individual possesses an essence of self that he or she must put in effort to discover. He writes that we have "a self, a kind of intrinsic nature which is very subtle, which is not necessarily conscious, which has to be sought for, and which has to be uncovered and then built upon, actualized, taught, educated." Overall, writes Maslow, "the notion is that something is there but it's hidden, swamped, distorted, twisted, overlaid" (688). We are born into this world genetically individual and unique,

and “the first job of each of us for ourselves, is to uncover and discover what we ourselves are” (689). This theory relies on the fact that we are all born our own beings, with our own genetic makeup to build from. Would clones, who are born genetically the same as the ‘original,’ have a unique essence of self to discover? And if so, are they capable of discovering this self-essence?

The entire concept of cloning brings individuality and self-realization into question. Wilhelm suggests that clones do have an individual essence of self and are capable of self-discovery, but never to the full extent that a genetically individual human could be. The example Wilhelm provides is Molly. Molly is one of her cohort of clones selected for an expedition outside of the valley that the clones call home. They are in desperate need of resources, and so select one from several clonal groups to take part in the expedition to search for some. While on the journey, those traveling are mentally challenged by being so far from their brothers and sisters, with whom all clones have a deep, empathic bond. Due to the circumstances, Molly and the others become mentally and emotionally frayed. But while most of those on the crew seem to go mad, Molly is able to find a sense of self:

And often when she had been at the oars for a long time, something else happened, and she felt a release. At those times strange visions came to her, strange thoughts that seemed untranslatable into words. She looked about in wonder and the world she saw was unfamiliar, the words she would have used to describe it useless, and only color would do, color and line and light. The terror was stilled, and a gentle peace filled her...it was almost as if she were alone with the river that seemed to have a voice, and infinite wisdom. The voice murmured

too softly to make out the words, but the rhythms were unmistakable: it was speech. (Wilhelm 102)

Molly hears her own inner voice for the first time because of the solitude that the expedition forces upon her. She comes to accept and welcome the peace and inspiration it brings, the “color and line and light.” And when they arrive home, Molly’s siblings help her from the boat, and “she stared at her sisters, who were strangers to her” (103). She is her own self and is unable to reconnect with the deep empathetic bond that her sisters share. Molly is ultimately exiled because she cannot connect with her sisters empathically, shows no desire to reconnect with them, and causes them to fear her and her individuality. Later, after being exiled, her creativity is more prevalent than that of any of her sisters, and she creates several art pieces that put into words the feelings she cannot verbalize. When Ben comes to evaluate her, as a counselor would, in her exiled cabin, “she would talk about anything, answer any question he asked, except about her paintings” (130). Molly tells Ben “I feel... I don’t know how I feel. Like something’s gone that was heavy and hard to live with. It’s gone, and I feel light and free and yes, even happy” (126). While other clones feel exile is a death sentence, Molly feels set free by it, and it fosters her individuality. She demonstrates self-realization. She is able to think on her own, create on her own, and be more of her own person than any clone before her. However, Molly is the only clone in the novel to fully do so, so she is a rarity; thus, the novel suggests that clones do have the capability for self-realization, but the circumstances must be right for the opportunity to present itself. In Molly, Wilhelm uses character development to explore whether clones could develop individuality and to what extent it would alter their understanding of self.

Molly's unique individuality gives her the ability to do what no clones have been willing to do before: sexually reproduce and raise a child as an individual. While exiled, Molly only comes into contact with those who bring her food and provisions. One of them, Ben, who had also been on the expedition and gone through some individual psychological changes as well, becomes romantically involved with Molly. They have a child, Mark, who Molly is able to hide for several years of his childhood before he is discovered and taken away from her. Mark, the first child born of sexual reproduction in several generations, is born with a unique sense of self and never feels frightened of being alone. He often disobeys the rules, acts out, and is punished. For the clones, the ideal punishment is to put someone in a room by themselves. For Mark, this is no punishment, and this in many ways is the beginning of his understanding of how he differs from the clones. He sees this time alone as opportunity for self-reflection and creativity, to think about art and expression. The clones tell him that this is wrong, and they don't understand him. But his mother helps him realize that his individuality is not wrongness: "They'll never understand. They can't hear that other self whispering... they'll never hear or get a glimpse of that other self. The brothers and sisters overwhelm it... perhaps it dies" (149). The clones are too consumed by their empathy for one another to be able to foster their individuated self-essence; instead it is smothered by the collective voice. According to the theories of humanistic psychology, they will never be able to reach self-realization because they refuse to recognize the unique individual and the individualized experiences of each person. They lose the ability to become a whole human being, to separate and become individuated, and their community will suffer for it.

Because of his individuality, and stark contrasts with the clones, Mark enables the older generations of clones to realize all they have lost through cloning. They are doomed to continue to be merely copies, to further replicate the characteristics that they value in each copy, but not to generate something new. Mark has abilities the clones cannot learn: comfort with loneliness and the creativity of new ideas. Mark is able to survive in the woods alone, “without danger of mental breakdown through separation” (Wilhelm 130). And no matter how much the clones insist Mark teach them this skill, they are unable to learn it. To them there are “no common grounds for understanding. He was an alien in every way” to them (131). But what makes him “alien” and different from the clones are what ultimately enable him to survive. The clonal structure is dying as they run out of parts for their clone-creating machines and they lack the ability to think creatively and problem solve. One character comments on the clones’ lack of ability in this area: “they learned everything they were taught, he realized, everything. They could duplicate what had gone before, but they originated nothing. And they couldn’t even see the magnificent snow sculpture Mark had created” (155). Mark uses his art to make the clones realize how much they have lost. He makes a snow sculpture, and the newest group of clones sees nothing but snow in it. They lack the ability to think creatively entirely.

This lack will lead to the clones’ downfall, whereas Mark rises. In her book chapter, “The Eternity of the Same: Human Cloning and Its Discontents,” Maria Ferreira uses the words of psychoanalyst Marie-Louise von Franz to encapsulate the dangers of a lack of creativity: “civilization which has no creative people is doomed... The person who is really in touch with the future is the creative personality” (153). Ferreira applies this line of thought to the events in *WLTSBS*, in that “the new clone society is condemned

to gradual decline and annihilation. Mark is the only one with the creative capacity to survive, to go on producing culture and art” (153). In their focus on creating more of the same, of what they value, the clones have lost the genetic and psychological flexibility that would allow them to adapt to new problems. They see in Mark this potential to solve the problems that they are having, but Mark feels no kinship with them. Mark, however, “is horrified at the prospect of being absorbed into a clone group, engulfed in anonymity and standardization, devoid of critical or creative faculties” (Ferreira 162). Mark learns to value his differences, see what he is capable of as valuable, and in the end abandons the clones to perish in their doomed culture of sameness.

Wilhelm’s warning about cloning is clear: sameness will limit us and leave us lacking. While the empathy that clones feel is not inherently wrong, their drive to get rid of all things that are individualistic is what truly cripples them. In his article discussing cognition and cloning, Darko Suvin summarizes this well: “The loss of imaginative powers that flows out of their sameness leads to destruction of their community. Only a very few individualist misfits with imagination, who leave the community, survive” (67). Humanistic psychology insists that what make us unique individuals is our creativity and ability to self-reflect, know oneself, and be comfortable in our individuality. While clones have the potential to find their self-essence, as shown with Molly, the chances are slim that they will ever fully develop into individuals in the way that sexually reproduced humans can. There is an “imaginative power” in individuality that they lose in their “sameness,” and their being so engulfed in their empathic connection of sameness hinders, if not completely extinguishes, their chance of developing a sense of self and singular identity. Humanistic psychology encourages us to consider the whole person in

understanding human nature. The clones will only consider the group, not the individual and all the depth of growth possible in one person's experiences. This idea is "alien" to them, and limits them, leading to the collapse of their way of life. Mark, who is capable of empathy and human connection, but does not rely on it, and who has his own strong sense of individuality and creativity, represents Wilhelm's particular model of human nature, one that is fundamentally informed by the key elements of humanistic psychology, which were circulating when she was writing the novel. The ability to empathize must be there, but what truly defines us as human is our ability to know ourselves as individuals and to use our skills to create, problem-solve, and generate new ideas.

Wilhelm links creativity and individuality with survival. Without creativity, and a discovery of the self and individuality, the clones cannot survive. The world evolves, and since the clones lack creativity, they are stuck in their ways and are doomed to die out. The survival of humanity hinges upon creativity. In "'To Love That Well Which Thou Must Leave Ere Long': Creativity and the Journey of Maturity in Wilhelm's *Where Late the Sweet Birds Sang*," Paul Kucera affirms that creativity is the essence of individuality, and therefore humanity, making it clear that only the 'human' can survive in Wilhelm's changing world. Kucera states:

Wilhelm herself points out that, in this novel, with its examination of a clone society, she is "interested in the idea that loss of individuality, the self, would destroy the urge towards artistic creativity" (Codagon 13). Seen in light of Wilhelm's own interpretation of the basis of her novel, the nature and definition of humanity that Wood mentions seems likewise the nature and definition of the

individual; moreover, the definitions are inseparable from creativity. To explore creativity is to explore individuality, is to explore humanity. (364)

Creativity is the nature of individuality and a defining feature of humanity. Therefore, in the clones choosing to give up on their capacity for creativity, and instead replacing it with connection and similarity, they lack the ability to develop their individuality and humanity. The key here is that the clones make the choice to stunt the development of creativity within their society. By choosing to disregard it, the clones over time are born without the ability to think creatively. If they are given the chance to be separate and foster their individuality, and they choose to grow through self-reflection, as Molly did, they can become more 'human.' It is fitting then, that Molly is the one to give birth to Mark. As the only clone to truly develop a sense of individuality, she presents the best groundwork to raise a new child to be an 'individual.' She ushers in the resurgence and survival of humanity by raising Mark with the opportunity to be creative, develop his individuality, and in doing so be more 'human' than the clones.

Conclusion

Science Fiction creates worlds of scientific advancement that force us to reflect on the commonalities between fictional worlds and our own real one: what makes us essentially human. Mary Shelley's *Frankenstein* was one of the first to create such a world. Her creature was different from what we biologically define as human, and yet reflected our common desire to connect and find belonging with others, requiring us to recognize the emotional humanity within this visually grotesque being. Shelley pivots the reader's perspective from outward appearance to the emotional potential and sympathetic connections necessary for humanity. The reader is forced to recognize the value of these

capabilities, and then notices that the biologically “human” scientist is more lacking in emotional humanity than the creature. There is a cognitive dissonance between what the reader once thought humanity was defined by and what the reader now sees reflected in the characters. This leads to the conclusion that humanity’s definition must encompass a base of both biology and emotion, but without emotion and sympathy we become less human. Shelley’s focus on defining oneself beyond physical characteristics has become a common theme in Science Fiction’s models of humanity. Other authors, like Wilhelm, have also chosen to center their models of humanity around what defines us emotionally and psychologically rather than physically. While the science has evolved, the message remains that what makes us human is more than our biological makeup.

Cloning presents a similar, new biological frontier to *Frankenstein*, and therefore reflects Shelley’s methods in newer Science Fiction. Suvin tells us that, “like a lab experiment, a piece of fiction is an event resulting in new insights, or better, a new transmissible and public competence of those reprocessing and if need be reapplying the experiment or the story” (71). Kate Wilhelm’s *Where Late the Sweet Birds Sang* presents a new Science Fiction thought “experiment,” and gives “new insights” into the modern model of humanity. In the world Wilhelm creates, global warming on reproduction forces humanity’s hand, leaving cloning as their last hopes of survival. But once created, the characters and the reader quickly realize that the clones do not match up with our understanding of humanity, creating a cognitive dissonance and forcing the reader to re-evaluate what it means to be human. Wilhelm uses the clones to show us what about our humanity would be lost if we were to breed sameness: our sense of self essence, individuality, and capability for creativity. What makes us human in Wilhelm’s novel is

more than our biology, as clones are not completely incapable of developing their individuality and creativity. Our humanity is grounded in our individuality and cultivated through creativity. The model of humanity that Wilhelm asserts in her novel is similar to and reflective of the continuation of Shelley's methods: create a character/characters where they meet most categorizations of "humanness," but not all. This creates a disagreement between what the reader understands the definition of humanity to be and what they see exemplified within the novel, which is a cognitive dissonance that must be resolved. Around every twist and turn of the story, the reader continually recognizes where the character doesn't quite match up with what they thought they knew. They are unable to avoid the disparity. This urges the reader to reconsider their previous definition of humanity. They must re-write their definition to accommodate what they have discovered within the thought experiment of that particular Science Fiction novel. Through this process, works like *Frankenstein* and *WLTSBS* use a fictional world to challenge our perceptions and understandings of the real world.

While their methods in creating their novels based in science and psychology are similar, it is important to note that Shelley and Wilhelm's defining traits of humanity contrast greatly. Shelley was highly influenced by the psychological models of her time—on belonging and sympathy—which overall affirms connectedness as the nature of humanity. *Frankenstein* emphasizes relationality and belonging as fundamental to the self and human thriving. The opposite is true in Wilhelm's novel. Wilhelm was informed by humanistic psychology and an emphasis on individuality and uniqueness. Her model of humanity highlights the definition of 'human' as an ability to disconnect from connection with others and be creative individually, and so *WLTSBS* emphasizes individuality and

uniqueness as fundamental to the self and human thriving. Both authors look within components of connection and similarity, but give priority to different sides of those spectrums as what is most fundamental to human development. These two texts provide different ideas about what's most critical to the human self. For each author, the concept of humanity within her novel is significantly impacted by the psychological discourses circulating during the novel's formation.

Wilhelm also continues *Frankenstein's* model of offering readers a fictionalized warning about the dangers of scientific advancement. In both novels, science and advancement are not inherently evil. However, these stories convey the sense that we know far more about the biological process of reproduction, of creating life, than we should. Marks states, "There is a more general sense that there is something wrong about delving too deeply into biological life process (of reproduction and development) that should properly remain hidden and unknown," and, Marks continues, "As Nicholas Royle puts it, this is the feeling that, 'we are taking ourselves, and our world, to pieces; and this is happening in ways and at speeds that are beyond our control'" (337). Both Shelley and Wilhelm create worlds where the biology of humanity has been taken "to pieces," and then put back together again in a way that is not quite right. In both novels, the creators lose control of their creations, implying that we cannot control what we do not truly understand. The message about scientific advancement in all this is that advancement itself is not wrong, but we must not rush the process. Understanding takes time and effort, and we must hold ourselves responsible to taking the time and effort to understand as we create, or risk losing complete control. We must also recognize that humanity is more than genetic, and that our creations could demonstrate as much humanity as you or I, if

not more. Being human means having the capability and desire for empathy, and also a sense of self and individuality.

Science Fiction gives readers the opportunity to delve into these ideas and reflect not only on the novel itself but also outwardly, on our own modern world. This is what makes many works of Science Fiction so insightful. As our times change, Science Fiction works encapsulate a time period's beliefs by reflecting them in a fictional world. As science evolves, so do the messages that authors like Shelley and Wilhelm convey in their works. The model of humanity highlighted by each novel is given potency by the theories and experiences of the time in which they were written, eternally granting us a glimpse of a time and frame of mind through the thoughts these works of Science Fiction provoke in us. Suvin remarks, "a real strength of SF lies in its cumulative nature, reposing on the frequent readers' "genre memory," which up to a point mimics the experimental method and thus stabilizes the genre athwart the competing agendas" (73). Therefore, *Frankenstein* and *Where Late the Sweet Birds Sang* are and will continue to remain applicable as time passes. The worlds created in the novels are separate and timeless and offer us the ability to reflect on the differences and similarities between their worlds and our own. They are thought experiments whose outcomes are meant to warn, guide, and teach us more about ourselves and our humanity.

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