On August 30th, 1797, Mary Wollstonecraft Godwin was born to William Godwin and Mary Wollstonecraft in London, England. Her father was a “philosopher and political writer”(Bio) who is often regarded as “the founder of philosophical anarchism” (Philp). While Godwin was the author of several philosophical works and children’s books, his wife was a ‘famed feminist’ and a published writer (Bio). Unfortunately, Mary’s mother died “11 days after her birth... of puerperal fever, leaving Godwin...to care for Mary and her three-year-old half sister, Fanny” (Ty). Four years later, her father remarried to Mary Jane Clairmont, who already had two children of her own. Mary often received unfair treatment from her new stepmother, who sent her stepsister off to boarding school but “saw no need to educate [Mary]” (Bio). Still, she was educated by her father, who taught her how to read, supplied her with books, and allowed her to listen to “the political, philosophical, scientific, and literary conversations that [he] conducted with such visitors as William Wordsworth, Charles Lamb, and Samuel Taylor Coleridge” (Ty). In addition to reading, Mary enjoyed taking her own shot at writing, and once noted, “as a child... my favourite pastime, during the hours given me for recreation, was to write stories” (Shelley).
When she turned seventeen years old in 1814, Mary left with her father's student, Percy Bysshe Shelley, to England along with her stepsister. Though Percy was married, the two began a relationship while traveling in Europe, and suffered the loss of their first child who only lived to be a few days old (Bio). A summer later, Percy and Mary were in Geneva, Switzerland with some friends, where they would pass their time on rainy days by telling each other ghost stories. One of her friends, Lord Byron, “suggested that they all should try their hand at writing their own horror story” (Bio). Later, Mary wrote in her journal about a, “Dream that [her] little baby came to life again—that it had only been cold & that [she and Percy] rubbed it before the fire & it lived.” (Shelley). After this, Mary “[began] work on what would become her most famous novel, *Frankenstein, or the Modern Prometheus*” (Bio).

The remainder of the year was filled with death, first by the suicide of Mary's half sister Fanny, then by the suicide of Percy's wife. In 1816, Mary and Percy got married, and she took the last name Shelley. During the year 1818, "*Frankenstein, or the Modern Prometheus* debuted as a new novel from an anonymous author...and many thought that Percy Shelley had written it since he penned its introduction” (Bio). The book was received with great interest and was a big hit.

Mary later gave birth to three more children, only one of which, Percy Florence Shelley, lived into adulthood (Ty). She would go on to write several more novels, and suffered the loss of her husband, who drowned in 1822 (Ty).

In 1851, at age 53, Mary Shelley passed away due to brain cancer in London, England, and “was laid to rest alongside her father and mother and with the cremated remains of her late husband's heart” (Bio).

**Summary**

The British author Mary Shelley published her book *Frankenstein* in the year 1818. In this book, she conveys a story of Victor Frankenstein, a scientist that reanimated a creature from the dead. The story begins with Captain Robert Walton's journey towards the North Pole. Unfortunately, Walton's ship becomes stuck, surrounded by slabs of ice as they attempt to reach solid ground. Trapped on the boat with nothing to do, Walton begins writing letters to his sister, making accounts of his experiences and his desire to find a worthy friend. While stuck, the captain and his crew are able to make out a man riding a sledge pulled by dogs, and then...
save another man that floated towards their boat on a chunk of ice. This man happens to be Victor Frankenstein, and Captain Walton’s wish to find a friend out at sea appears to have come true. Upon talking to this new man, however, Walton finds out that Victor is in a life of despair, and he goes on to tell his life story.

Victor begins his narration by telling the story of his birth, family, and early childhood in Geneva, Switzerland. He then describes how his parents adopted his cousin, Elizabeth Lavenza, to become his companion and his future wife. Victor grew up in a close family and spent much of his time with his best friends Henry Clerval and Elizabeth. He became fascinated with the natural world, and one day happened to stumble upon a book by Cornelius Agrippa. Victor eagerly read the outdated studies of the alchemists Agrippa, Albertus Magnus, and Paracelsus, and then became captivated with electricity after watching a tree get demolished in a lightning storm. This joyful account of Victor’s early experiences with his close-knit friends and family gave a flash of his life that the readers know will soon be destroyed.

At the age of seventeen, Victor plans to leave for college at Ingolstadt. Just before departing, however, his mother catches scarlet fever from Elizabeth, and is unable to survive. After several weeks, Victor leaves his grieving family for college, where he goes to meet his natural philosophy professor. Victor is immediately told that his time spent studying alchemists was a complete waste, and he eventually begins studying the nature of the human body with enthusiasm. After two years of learning all that his teachers had to teach him about science, Victor continues to study human anatomy and death and decay, finally finding “the secret to life.”

Upon learning the secrets to life, Victor dedicates his time to his work, isolating himself from his family and any social interaction. He becomes determined to reanimate the nonliving and continually makes trips to the morgue, bringing back body parts of the dead.
to construct a body. He uses the biggest and best body parts he can find, eventually making an eight-foot giant. Upon finishing his creation and bringing the creature to life, Victor is terrified by the horrid appearance of his monster and flees his apartment. Victor then becomes very sick for quite some time and is nursed back to health by his friend Henry Clerval. While still sick, Victor is unaware of the whereabouts of his monster, and later receives a letter from his father that his younger brother, William, had been murdered. His family's beloved servant, Justine, becomes accused of the murder, but Victor for some reason believes that it was his monster's doing. Scared of sounding like a lunatic, however, Victor never discloses his information, and the innocent Justine is executed.

Victor and his family become full of grief and decide to make a vacation to the Swiss Alps, in an attempt to leave their misery.

Although this trip was intended to lift everyone's hopes, Victor runs into his monster again, who admits to the crime and goes on to tell Victor of his treacherous life story. The monster claimed only to have wanted to share love and friendship, but upon his continual rejection, he grew full of revenge. Victor's monster is livid to have been created miserable and alone, and offers Victor peace in return for the creation of a female companion for the monster. Victor, having experienced enough despair, eventual agrees to this, deciding to leave his home to start his work.

Victor keeps all of his work a secret to everyone around him, and attempts to deal with all of his problems alone. When Victor finally finishes his new creation, he becomes very fearful and then immediately destroys it. Having broken his promise with the fiend, the monster becomes enraged and vows to destroy Victor's life and everyone around it. Victor then leaves to continue his travels with his friend Henry, only to later find him strangled. Victor then becomes very ill again and his illnesses appear to be psychologically induced from his internal guilt. Just in the nick of time, his father comes to rescue him and brings him back home.

Victor made an agreement to marry his lifelong companion, Elizabeth, once his health was restored, but can't stop worrying of
how the monster said he’d be with him on his wedding night. Prepared to die, Victor goes on to marry the love of his life and they leave that day to spend the night at a family cottage. Victor becomes increasingly nervous of his anticipated confrontation with his treacherous monster, and asks his wife to retire for the night.

Victor continues to walk the grounds of the house with his hand resting on his pistol, but then suddenly hears Elizabeth scream from the bedroom. Victor finds his new wife strangled on the bed and attempts to shoot the monster, but misses due to its superhuman abilities. Having lost his one true love, Victor then returns home to be with his father.

When Victor returns home, he tells his father of the horrible news. His father then becomes ill with grief from the news and dies soon thereafter. With everything of meaning to him now lost, Victor makes a vow to hunt down the perpetrator until the end of his days. Victor then goes on with his story of tracking down the monster, eventually leading him to the North Pole and stranded on Captain Walton’s boat. Victor’s health continues to decline until he finally passes away. At about this time, the ice around the ship dissipates, and Walton decides to abandon his mission, fleeing back to land. After Victor’s death, the monster appeared beside his body to confirm his death. Hearing murmuring from this room, the captain enters and the monster goes on to tell him of all his sufferings. The monster then tells Walton that with his creator dead, he was now ready to die himself. The story then ends, leaving readers with the assumption that the monster rids the world of his disgusting presence as the ship continues to sail back to England.

**The Homunculus**

The idea of a homunculus, that is, a man-made human being or humanoid (e.g. Frankenstein’s Monster), is an idea going back to ancient times, although, it made a resurgence in the Renaissance period. One of the alchemists mentioned in *Shelley’s Frankenstein*, Paracelsus, wrote many different works over *natural philosophy* and alchemy. He was interested primarily in medicine, but he believed
Sperm with a Homunculus inside

If the sperma, enclosed in a hermetically sealed glass, is buried in horse manure for forty days, and properly magnetized, it begins to live and move. After such a time it bears the form and resemblance of a human being, but it will be transparent and without a body. If it is now artificially fed with the Arcanum sanguinis hominis until it is about forty weeks old, and if allowed to remain during that time in horse manure in a continually equal temperature, it will grow into a human child, with all its members developed like any other child, such as could be born by a woman; only it will be much smaller. We call such a being a homunculus, and it may be raised and educated like any other child, until it grows older and obtains reason and intellect, and is able to take care of itself. 

From the above grotesque formula, one can see that the basic idea is to take sperm, put it in a warm environment, feed it with human blood for a full gestation period, and it will develop into a child. This formula most likely got its foundation from the idea of preformationism: a small, fully formed person was, in fact, in the sperm of man and just grew larger after deposition into a woman. Obviously this idea was before we had modern science, and the natural philosophers of the time were looking into how man was conceived and born. Pythagoras was one of the first thinkers concerned with the biological origins of man, and he coined the idea of “spermism.” Spermism is the idea that man contributes the “essential characteristics of their offspring while mothers contribute only a material substrate” and was accepted by Aristotle and many natural philosophers up to the 17th century. Shelley most likely took ideas from Paracelsus, particularly those concerning homunculi, as inspiration for Frankenstein’s monster.

It has been suggested that perhaps Paracelsus and other alchemists used the idea of the homunculus as a way to secretly convey some of the teachings of alchemy, where the true goal was to turn other metals into gold or find the philosopher’s stone for the elixir of life. Looking at the ultimate goal with a figurative mindset rather than a literal one, one might deduce that this is merely a metaphor that symbolized an endeavor to “the spiritual transformation of the alchemist.” Expounding upon this:

The real aim of all the preparation and cumbersome apparatus, was to unite their [the alchemist’s] earthly, mortal soul with...
that of the Creator, to participate in the divine, to reawaken their spiritual consciousness, and to grasp the secret forces at work behind the natural world. In this the alchemists carried on the same work as their Neoplatonic forebears. (Lachman)

This is a peculiar idea and one that deserves mention; however, I am not sure how much truth resides in it. The idea that they were after immortality and endless gold seems more plausible, but then again, many of the notions that pervaded this time were completely illogical which makes it difficult to determine with any degree of accuracy what their true aims really were.

Alchemy

The Arabian Moors introduced alchemy to the Europeans in the 8th century. The number one goal of alchemist back in the day was to transmutate “base metals” into “noble metals” such as gold (“Contexts – Science – Alchemy”). By the 16th century, the alchemists split in to two groups. One group focused on discovering new metals and their reactions, which is now best known as chemistry. The second group continued “the search for immortality and the transmutation of base metals into gold, which led to modern day idea of alchemy” (“Contexts – Science – Alchemy”).

In Frankenstein, Mary Shelley mentions a few alchemists in the beginning of the book. Cornelius Agrippa, Paracelsus, and Albertus Magnus. Heinrich Cornelius Agrippa was an alchemist born in Germany who was also a physician practicing without a license. His
major works consisted of trying to synthesize gold from lead. Paracelsus was a well-rounded scientist who also studied botany and astrology. He was the son was chemist and physician, Wilhelm Bombast von Hohenheim. Paracelsus is credited for naming zinc, and he "pioneered the use of chemicals and minerals in medicine" ("Paracelsus"). Albertus Magnus was a Catholic saint accredited for the discovery of arsenic. He believed that stones had occult properties and was said to have discovered the philosopher’s stone.

The philosopher’s stone was a substance that was capable of turning base metals into gold and believed to be an "elixir of life" ("Philosopher’s Stone"). In Frankenstein, the "philosopher’s stone" is metaphorically represented by electricity and is used to put life in to Frankenstein the monster.

Alchemy does not play a big role throughout the book because Victor was discouraged by his early professors due to the belief of alchemy as being superstitious. However, Shelley does mentions chemistry stating:

To have gained a disciple; and if your application equals your ability, I have no doubt of your success. Chemistry is that branch of natural philosophy in which the greatest improvements have been and may be made; it is on that account that I have made it my peculiar study; but at the same time, I have not neglected the other branches of science. A man would make but a very sorry chemist if he attended to that department of human knowledge alone. If your wish is to become really a man of science and not merely a petty experimentalist, I should advise you to apply to every branch of natural philosophy, including mathematics.

From the statement above, one can conclude that Shelley believed chemistry was important, but during the 19th century, science was focused more on physics and mathematics.

Electricity

Throughout the book Frankenstein by Mary Shelley, electricity is a recurring theme and introduces the various uses and the importance of electricity. Although electricity’s complexity is not fully understood
Albertus Magnus writes the book, numerous brilliant scientists have contributed to the better understanding, which we have today. This has led to many advances in various aspects of the world in which we live. In today's society, electricity is essential to our daily lives. Electricity not only provides lighting and power, but is also an important tool in medicine.

Prior to the 19th century, scientists were beginning the exploration of electricity. The major studies revolved around the transfer of electricity, the attractions, lightning, and the Leyden jar. All of which impacted the later scientists experimenting with electricity.

Luigi Galvani was one of the scientists that used these previous discoveries to facilitate his research. Galvani is responsible for the discovery of muscle contraction due to electric impulse. Galvani stimulated the muscles of deceased frogs and severed frog's limbs. This experiment was completed by exposing the nerves to electrical currents. In the article, An Essay on Electricity, George Adams writes about the results of an experiment done by Galvani to see if lightning would cause the same stimulation in the frog's muscles as with electrical impulses in the laboratory.

On this preparation the thunder and lightning produced the same effects as the spark from the electrical machine: the same contractions took place, and they were stronger or weaker according to the distance and quantity of lightning. Thus far the effects might have been naturally expected; but a remarkable circumstance was observed, which serves to explain another phenomenon of nature: it was found, that instead of one contraction at every clap of thunder, the limbs were affected with a sort of tremor or succession of convulsions, which seemed to be nearly equal in number to the repetition of the thunder, viz. that succession of explosions which forms the rumbling noise of thunder. (Adams, George, William Jones, and John Birch)

The results of this experiment led to many other experiments and affected the world of science a great deal. Many scientists used Galvani's findings as a fundamental aspect of their further research in this area. However, a famous scientist, Alessandro Volta's disagreed with Galvani's findings. His experimentation led to his belief, which is stated in the article Galvani and the Frankenstein Story that “the electrical phenomenon that Galvani observed arose from the action of dissimilar metals, not an internal property of life”. This is said to have sparked the arguments between “the animalists and the metallists” (“Galvani and the Frankenstein Story”). His findings led to the invention of the
Electrical Experiments

battery and he coined the term “Galvanic action.”

Giovanni Aldini, who just so happened to be Luigi Galvani’s nephew, studied the medical uses of Galvani’s experiments. Aldini worked as Galvani’s assistant for many years before continuing and furthering his research and it’s findings. Aldini experimented with other animals, not only the frog, but also human corpses. He was known for traveling the world and putting on shows where he would electrify human and animal corpses. The shows were intended to convince the people of the world that animal electricity did exist. These shows would depict the muscle and limb convulsions that occurred when electrical currents were applied to different areas of the body. André Parent wrote an article called Giovanni Aldini: From Animal Electricity to Human Brain Stimulation, in which he describes Aldini’s motives and other contributions to science and medicine. In this article, Parent describes one of Aldini’s most famous shows.

Aldini’s most famous demonstration took place on Monday, January 17, 1803, at the Royal College of Surgeons. There, Aldini used bimetallic electricity to shock and convulse the corpse of George Foster, a 26-year-old criminal who had just been hanged at the prison of Newgate for the murder of his wife and child who he had drowned in the Paddington Canal. Aldini specified that: “Galvanism was communicated by means of three troughs combined together, each of which contained forty plates of zinc, and as many of copper.” The results were dramatic: when the rods were applied to Foster’s mouth and ear, Aldini mentioned that “the jaw began to quiver, the adjoining muscles were horribly contorted, and the left eye actually opened.” When one rod was moved to touch the rectum, the whole body convulsed: indeed, the movements were “so much increased as almost to give an appearance of reanimation.”... many began to believe that electricity might be the long-sought vital force. (Parent)

There is no doubt as to why this is said to have been one of Aldini’s most famous shows. The ability to cause such incredible convulsions by electrical current is astounding. Aldini was not only able to
cause convulsions of a corpse, but was also able to encompass a treatment for the mentally ill. Parent also recounts different instances and reactions of scientists to the treatment of some mental diseases; one in particular is the reaction of a famous psychiatrist. The following are his thoughts written by Parent.

At la Salpêtrière Hospital, he met with the famous psychiatrist Philippe Pinel (1745-1826), who was astonished to see the muscular contractions that resulted from Aldini's application of galvanism on an old woman who had just died from "putrid fever." Pinel was even more impressed when he learned that Aldini was successful in using galvanism to treat patients suffering from various mental disorders in Bologna.

The ability to treat those affected with a mental disease was a miraculous breakthrough in the world of science and medicine. Aldini's approach to the treatment of mental diseases led to some of techniques in treating the mentally ill today.

The scientists discussed above not only had an impact on today's society, but they immediately impacted many of the works of literature during this time period. Galvani and Aldini are likely to have made an incredulous impact on Mary Shelley in particular. It is likely that the experiments performed by these men and their results aided Shelley in writing the book *Frankenstein*. The book demonstrates the use of electricity to bring to life to an assembly of human body parts. Shelley writes:

> With an anxiety that almost amounted to agony, 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. It was already one in the morning; the rain pattered dismally against the panes, and my candle was nearly burnt out, when, by the glimmer of the half-extinguished light, I saw the dull yellow eye of the creature open; it breathed hard, and a convulsive motion agitated its limbs. (Shelley)

Shelley uses the tale of Frankenstein to criticize the science of her time and to demonstrate the shortcomings of seeking knowledge that is beyond our limits or as some would say "playing God." The experiments conducted by these great scientists may have been controversial during the 19th century, but led to the advances that seem to be crucial to a variety of aspects in medicine and everyday life.

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