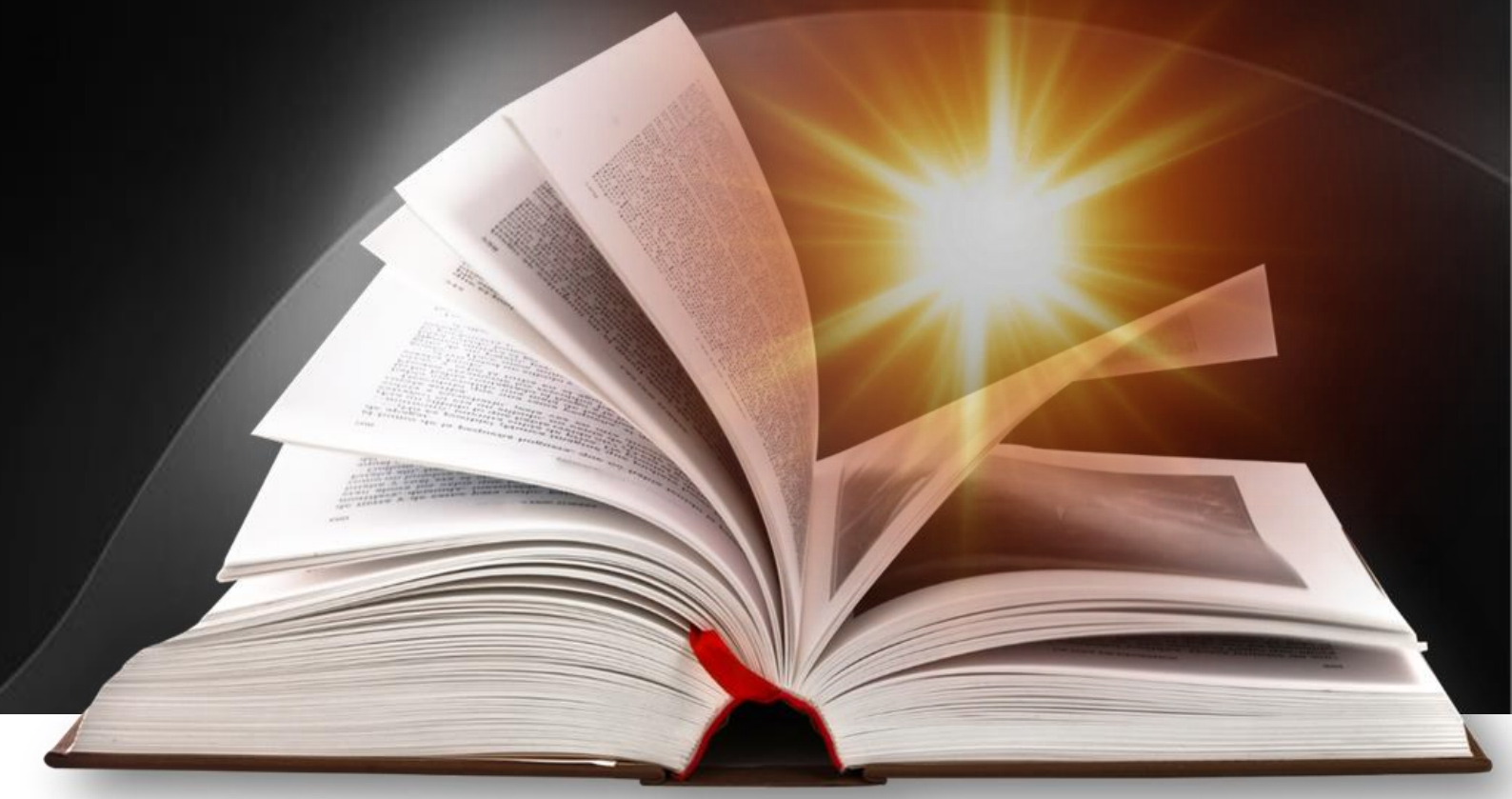
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# Ethical Limits of Science and Technology in *Frankenstein and The Last Man*

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# Editorial

C'est avec une exaltation palpable que nous vous convions à explorer les tréfonds de la pensée et de l'innovation africaines à travers ce dernier chef-d'œuvre, le couronnement de l'année 2023 pour la Revue Panafricaine de la Jeunesse. À l'intérieur de ces pages, se déploie une mosaïque foisonnante d'idées et de perspectives, émanant des esprits les plus éclairés du continent africain et au-delà.

Notre objectif transcendantal reste clair et impérieux : éclairer la scène intellectuelle pour les décideurs politiques, les chercheurs, les acteurs sociaux et toutes les âmes assoiffées de connaissance, en offrant des données scientifiques solides comme socle inébranlable.

La Revue Panafricaine de la Jeunesse s'est affirmée comme une voix internationale, un carrefour où convergent et s'entrelacent des études profondément enracinées dans la réalité africaine. Autrefois freinées par des barrières éditoriales, ces études rayonnent désormais, reflétant la diversité des voix et des expériences qui composent la richesse de notre continent.

L'essor fulgurant de la science africaine est un patrimoine collectif à cultiver, une source d'énergie à entretenir avec ferveur. Les membres dévoués de notre comité scientifique, accompagnés d'experts issus d'horizons variés, ont embrassé avec ardeur le défi d'enrichir la pensée africaine. La diversité des connaissances et des idées, s'étendant des confins d'Afrique et au-delà, fait de la RPJ une plateforme panafricaine en constante métamorphose, porteuse d'une promesse renouvelée à chaque page.

En tant que bastion de la recherche africaine, la RPJ s'engage avec intransigeance à maintenir des normes de qualité rigoureuses, chaque article publié étant le fruit d'un processus de sélection sérieux avec un taux d'acceptation de 50%. L'enthousiasme chaleureux que nous recevons d'un public vaste et diversifié, tant africain qu'international, est une attestation vibrante de notre engagement indéfectible à promouvoir une science africaine robuste et irréprochable.

Ce numéro exceptionnel présente les contributions de chercheurs éminents, explorant des domaines aussi variés que la jeunesse, l'éducation, le sport, l'environnement, le développement durable, la santé, la psychologie, le droit, la politique, la sociologie, les lettres, les langues, et les arts. Chacun de ces articles, ciselé avec minutie, offre une plongée captivante dans des thématiques cruciales pour notre temps.

Notre équipe éditoriale, main dans la main avec notre comité scientifique et nos évaluateurs externes, travaille sans relâche avec les auteurs pour garantir la qualité et

la pertinence de chaque contribution. Cette synergie collaborative est cruciale pour propulser la science africaine au pinacle international, assurant que les sociétés africaines récoltent pleinement les fruits de la recherche novatrice.

Nous vous invitons à vous plonger avec passion dans ce numéro captivant, à dévoiler les trésors de la science africaine et à rejoindre notre communauté de lecteurs. En participant à cette aventure intellectuelle, vous contribuez à renforcer l'influence de la science africaine à l'échelle mondiale, ouvrant ainsi la voie à des sociétés africaines éclairées par les lumières de la recherche de qualité. Embarquez avec nous dans ce voyage fascinant à travers les découvertes, les innovations, et les idées qui sculptent le futur dynamique de l'Afrique et du monde.

**Dr Basile Mulwani Makelele**
Professeur des Universités

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# Ethical Limits of Science and Technology in *Frankenstein and The Last Man*

[Ethical Limits of Science and Technology dans Frankenstein et The Last Man]

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## Abstract

The present study is about the representations of science, technology and ethics in *Frankenstein* and *The Last Man*. It is an attempt to highlight a view of science and technology in connection to morally accepted values from the angle of creative writing. From a reader response perspective, the purpose of this article, is to look at the representation of the method of scientific and technological achievement and their limits. The study has found that the quest of knowledge and its applied uses can result in moral and ethical alienation and generate hardships to mankind as it is highlighted in the desperate commitment of the protagonists to destroy what his own wits have created.

**Keywords**: Literature, Science, Technology, Ethics

## Résumé

La présente étude porte sur la relation entre la littérature, la science et l'éthique. Il s'agit d'une tentative de mettre en lumière une vision de la science et de la technologie en relation avec des valeurs moralement acceptées sous l'angle de la création littéraire. De la perspective du « reader response » l'objectif de cet article est d'examiner la représentation de la méthode des réalisations scientifiques et technologiques et de leurs limites. L'étude a révélé que la quête de la connaissance et ses applications peuvent entrainer l'aliénation et générer des difficultés pour l'humanité, comme le

montre l'engagement désespéré des protagonistes à détruire ce que leurs propres esprits ont créé.

**Mots-clés** : Littérature, Science, Technologie, l'Ethique

# 0. Introduction

Literature and science are fields of endeavor that encompass different methods, aims and activities. Literature as a representation of human experience and predicament, focuses on the happenings of society and attempts to fictionalize the world by reflecting issues that occur in and determine human life. What happens in a society is reflected in literary works in one form or another (Dubey, 2013: 84)? This is illustrated by the work of many writers and scholars who have devoted their works to exploring the trends of the modern era as it became overwhelmed by the advancements in science and technology exposing how scientific progress has resulted to sudden disarray and destruction of human lives on earth. The work of such writers has contributed in exposing the threats and raising people's awareness on these problems pertaining to the future of humanity and stability in the society. As a result, such a view has been the motivation of Mary Wollstonecraft Shelley, one of the famous English novelists who has through *Frankenstein*[1] *in* 1818*1*and *The Last Man*[2] in 18262 exposed thoughts on the social, political realities of her moment, influenced mostly by the scientific progress.

It is worth noting that, since the nineteenth century, science is much more integrated and is visibly reshaping society in the form of new technology in such areas as transportation, lighting, communication, medical treatment and mass production (Flohr, 2005 :3) and also has increased man's curiosity and desire that push him to further his research beyond the limits of ethics at the risk of drawing the world into complex predicament. Burke *et al* view that science has greatly contributed to the uplift of people's lives in such a way that changes and improvements have been possible. But these improvements have also endangered the course of human life by make him a slave of discoveries and creations. (1985: p.iii). According to Asimov: "Science does not purvey absolute truth, science is a mechanism. It's a way of trying to improve your knowledge of nature, it's a system for testing your thoughts against the universe and seeing whether they

[1] Shelley, M. (2020*). Mary Shelley collection: Frankenstein, The Last Man, Selected Tales & Stories".* Monee, IL.USA.Subsequent quotations from *Frankenstein* are parenthetically included within the text as *F*followed by the page number.

[2] Shelley, M. (2020). Mary Shelley collection: *Frankenstein, The Last Man, Selected Tales & Stories".* Monee, IL.USA.
Subsequent quotations from *The Last Man* are parenthetically included within the text as *TLM* followed by the page number.

match." (Asimov,1989). Scientific advancement has led to the development of the world, it has made people promote ways of thinking and of changing their way of life. This led them to distort the natural way of things regardless of the effects. However, moved by the scientific method and research, modern man could not stick to the ethics values that should accompany scientific efforts. Ethics in the framework of this study should be understood as "a branch of philosophy that used to study ideal human behaviour and ideal ways of being." (Rich, 2007: 4). This implies morality that ethics and science work to achieve human welfare while the method of science turns out to fall into deviance and alienation that lead to dismaying outcomes.

Mary Shelley's *Frankenstein* and *The Last Man* received much criticism and inspired re- writings. These novels' critiques by scholars have enlightened readers on the issues of science and technology and the outcomes that have followed uncontrolled scientific breakthrough. They have also looked at how scientific and technological methods and their excesses can prove harmful to humankind and nature. In connection to the two novels, Hugh Luke states that: "Both grow out of the tradition of the Gothic novel, although neither may accurately be classified as belonging to that genre. Both are animated by the same deep interest in the impact of scientific knowledge on human life and human institutions." (Luke, 1965: 316-327). From this extract, one can say that the two novels by Mary Shelley elaborate on the scientific development and its innovation but also to its impact on the society.

The purpose of this article, is to look at the representation of the method of scientific and technological achievement and their limits. It also attempts to highlight a view of science and technology in connection to morally accepted values from the angle of creative writing.

In the light of New Historicism, we intend to analyze the novels in their historical, cultural, political and social contexts, in order to uncover how the novels are shaped by the discourses and the context that influenced Mary Shelley's writing. Subdivided into three sections, the paper focuses on ethics and science and attempts to lay emphasis on the moral values and the limits of scientific endeavors. The first section is about Modern man morality and represented in the novels under study. The second section elaborates on ethics in scientific progress while the third section sheds lights on the need to establish a balance between scientific progress and the survival of humankind.

# 1. Modern Man and Morality in *Frankenstein and in The Last Man*

For the development of a good society, the need to respect social values is important. Each society is called to live in harmony. This thanks to the importance of the role played by each individual. According to Rich, "Morals are specific beliefs, behaviours and ways of being derived from doing ethics." (Rich, 2007: 4). It calls us to view that morality is concerned with our beliefs and attitudes that seems to be judged as good or bad through ethical analysis. Velasquez advocates that, "Morality consists of the standards that an individual or a group has about what is right and wrong or what is good and evil." (Velasquez, 2015: 489). Human beings are governed by some principles and standards. Standards refer to the beliefs, to the conducts, and rule of conduct by which people live. Acting in moral manners means individuals must sacrifice their own short-term interests to benefit society, to have the capacity to determine what is right and acceptable.

The arise of scientific and technological development has provided to human beings new ways of mentality and even ways of seeking to give the strength to humans to work for their survival. Mary Shelley's *Frankenstein* and *The Last Man* reflect the morality which is meant as a critique of science, and a warning to humanity not to play God.

The world with its changes enables man to further their knowledge and enhance their possibility in producing with materials. As Frankenstein who states that, "I ardently desire the acquisition of knowledge. I had often, when at home, thought it hard to remain during my youth cooped up in one place and had longed to enter the world and take my station among other human beings." (*F*: 27). However, in his thoughts, and interactions, his researches fails; he values himself as more intelligent and more human than those around them. Frankenstein has forgotten what is morality. Desolation, injustice, creation of new tools, the disconnection of human from the nature, and the immorality toward the natural law becomes the inherent attitudes of man. He says, "Curiosity, earnest research to learn the hidden laws of nature…" (*F*: 20). The sense of collaboration is abandoned; profit, self-interest become the pursuit of the modern man.

Frankenstein decision is to be considered as morally wrong. The conception of morality which is to reflect on the good actions and take the right decision become a forgettable issue.

Victor Frankenstein as scientist has furthered his researches to know the origin of life, how to give life to a corpse and not the real one but a dead body. He sees himself as

capable of being and doing as God who has created him. He challenges his own life by disconnecting himself from the natural laws. He uses the ideas of scientific enlightenment and goes against what is perceived at the time to be morally correct. As a human being, he decides to create also a being that he seems not knowing what it will cause to his society. The loss of fear and consideration to his surrounding force him to immoral decision or wrong actions. Victor attempts to surge beyond accepted human limits for the acquisition of a forbidden or undiscovered human knowledge. Some critics advocate that the novel cravings "no lesson of conduct, and manners or morality". Frankenstein passes through artificial method to create his creature. Under normal circumstances, before having a baby, God has set a natural process, which says that man and woman should pass through sexual intercourse but Frankenstein with his scientific abilities ignores this and his limits and he undertakes his own way of understanding the phenomenon of procreation. Thus, with scientific and technological advances, manners and morality have disappeared in our society. From the behaviour of Frankenstein and his experimentation, it is obvious to state that Mary Shelley in her narrative reflects the incidents and sentiments from her own life. She wrote her novel around the time of giving birth to her son. Much later, she lost her son and this let her in a trauma. Therefore, the creation of the monster by Frankenstein is the repressed expression of Mary for her to revive the life of her beloved son.

Furthermore, Mary Shelley in *The Last Man* has enlightened also this fact of morality, which seems to disappear on human behaviour. *The Last Man* in treating contagion as a metaphor for how political ideologies as war manifestation. Verney through his narration has shown the real fact, which has portrayed man as being immoral. Man is obsessed by his vision in such a way that he has put aside the moral aspect of life and application in his actions. Like Lord Raymond as a powerful man, whose passions are violent, and look on the structure of society as part of the machinery which supported the web on which his life is traced (*TLM*: 179). His action has been lamentable for his people. He decides to get power by conquering lands, by undertaking a war. The war between Greeks and Turkish were under his control. With the scientific development, man thought that science is a provider of happiness and social needs. Yes, in fact, it has been, what modern man did is to take morality from the negative side of it. Because of immorality, man has created things, tools that, we never care about the result. The action made by Raymond has polluted the environment; he mocks the natural world by leaving sureties, he unleashes the plague which causes the extermination of the world. "Laying aside his sword, peace and its enduring glories became his aim." (*TLM*: 220). He shows that his ambition controls him and he cannot control himself. Morality advocates that man is able to judge between the right and

the evil but the modern man is now showing the contrary. As Raymond expresses himself by saying: "I cannot rule myself. My passions are my master; my smallest impulse my tyrant." (*TLM*: 248). This assertion reflects human beings' part. We are overwhelmed by our ambitions that we seem incapable to judge and even choose the right one. Raymond does not care about other men but he renounces all for his gain. He cruelly uses or prey upon his fellow creatures in order to advance their own craven interest. (Freud, 1962) suggested that moral development occurred as a person's ability to set aside their selfish needs were replaced by the values of important socialisation. However, seeing the behaviour of Shelley's characters, it is obvious that they are affected by their ego, which influences them toward amoral action. Their desires have been taken over them. Mary has portrayed the recurrent behaviours which are the image of making power of the mind, and the ability to think and draw the image in mind.

Human beings from their birth are considered to be endowed with moral values. God has created man with the ability to think and to make a difference between the bad and the right actions and the capacity to critical thinking. Performing an action is to expect to positive or negative consequences. Modern man ignores moral values and takes it in a different way just for material and credit things. They completely ignore the moral side of life and, only struggle for materialism and economic vision. According to Leonel, False was all this—false all but the affections of our nature, and the links of sympathy with pleasure or pain. There was but one good and one evil in the world-life and death. The pomp of rank, the assumption of power, the possessions of wealth vanished like morning mist. One living beggar had become of more worth than a national peerage of dead lords---alas the day—than of death heroes, patriots, or men of genius. There was much of degradation in this: for even vice and virtue had lost their attributes---life---life—the contribution of our animal mechanism--- was the Alpha Omega of the desires, the prayers, the prostrate ambition of human race. (*TLM*:337)

The idea of sacred life disappeared from human mentality. Man living on earth has stopped reasoning with moral when it comes to act or use his knowledge for ambitions. Modern Man does not care about God; he has caused negative consequences with a large desolation toward other humans. As Leonel says: "Once man was a favourite of the creator, as the royal psalmist sang, "God had made him a little lower than the angels, and had crowned him with glory and honour. God made him to have dominion over the works of his hands, and put all things under his feet". Once it was so; now is man lord of the creation? Look at him—. (*TLM*: 353-354). Leonel being affected by world desolation of human behaviour has questioned this kind of behaviour. Humans take the place of God they replace the hand of God; they really do not need again the

hands of the spiritual God. The value of morality does not have any concerned with humans. Humans actions, which should be accompanied by morality, is abandoned. Frankenstein asserts that, "if I could banish disease from the human frame and render man invulnerable to any but a violent death." (*F*:22). One can remark that morality as the idea of sympathizing with his community sound in this assertion but at the end what he does become dangerous to him and his society.

Furthermore, Frankenstein from his selfish mentality has acquitted and put all his forces in the discoveries and inventions. One interest is seen as the primary fact of the vison, with the acquirement of scientific knowledge. Individual has struggled to know scientific principles and these have transformed and led to the loss of morality. The moral sense has disappeared from them. To have a feeling of pity toward once life is part of moral values. However, Frankenstein' decisions are put in advance, he thinks of his own interest and his fame that made him an egoist and self- centred person. He did not think of the welfare of of his family. He does no longer feared anything. He remained focused on the results of his research and invention. In his own words: "As the minuteness of the parts formed a great hindrance to my speed, I resolved, contrary to my first intention, to make the being of a gigantic stature, that is to say about eight feet in height, and proportionably large. After having formed this determination and having spent some months in successfully collecting and arranging my materials, I began." (*F*: 31)

The quest for fame and honor made the protagonist careless and he remained driven such mindset throughout the novel. The type of human beings Shelley represents in the person of Frankenstein are only concerned with their self- interest, regardless others. Frankenstein's intention is to create a being never made before. By Selfishness and egotism, he does not confide his ambition or decision to any of his elders; to mean his professors to revisit or judge it. He keeps all to himself. He does not observe any form of morality in all he does. The same character features are seen in *The Last Man* through the character known as the Duke, Ryland and the interactions he keeps with the people around him.

The recurrent action is selfishness, isolation and abandonment. Towards the disease, they seem to protect only themselves. The concerns of Victor, Ryland, Raymond and the Duke, portray the mindset of man during the Industrial Revolution marked by romantic representation of human predicament. In a justification of the period that informs Shelley's novel, one can xonsider the views of new historicist, who think that the literary text, through its representation of human experience at a given time and place, is an interpretation of history (Tyson; 2015: 280). Shelley reveals the persistence of the romantic view, which is characterized by the selfish and

individualistic behaviour. The progress of science since the 19th century is led by the uncontrolled ambitions that skipped up. Modern man does no more think in terms of what is moral or normal. Victor represents modern man who refuses to listen to the calls of his consciousness, which recalls the accepted norms of the society. But all this is in vein because Victor is overwhelmed and guided by his instinctive desire. In fact, Mary Shelley has shown that life without any morality led to perdition. Some of the people in *The Last Man* flee and confine themselves during the contagion but end up in desolation. At the same time Leonel is portrayed as a character with a good morality whose ambition in life is to show empathy and help people, to search for the well-being of all in society.

Human beings abandon morality and unavoidably leads them to their own destruction. This is what happen to Frankenstein. It is true that human beings can die, and they are not created to live forever, they have a limited life or time for survival and they have to go their way for the regeneration of the world but he never thought of that. This pushes him in the pursuit of eternity, which has caused evil to him and his society. He becomes absorbed in creating the being. He completely ignores his social life for years of tireless work. He says: "I knew well therefore what would be my father's feeling, but I could not tear my thoughts from my employment, loathsome in itself, but which had taken an irresistible hold my imagination;" (*F*: 32). He is so excite for his ambition that he could not think about possible consequences. He the image of scientists who don't lose sight of the set objectives irrespective of what they can destroy on their way to it.

Moreover, the portrayal of scientific instruments in *The Last Man*, as guns, arms, military engines, Shelley tries to point at man's illusion of immorality through his manipulation of scientific results or evidence. Lord Raymond, falls in the same traps as Frankenstein when his experimentations do not seek to embody society and priority. Mary Shelley presents a decayed image of modern man under the grip of science and its strictures. The issue of morality seems to disappear in modern man life and actions. Through an insight into the practice of science this section has shown that morality is the focus of science and scientists. It has also shown how scientists regard their experiments as the priority without being aware that the result of their hard can turn into a threat to society.

## 2. The Ethics for Science and its Improvement in *Frankenstein* and in *The Last Man*

Ethics is defined by Velasquez as "the study of morality. It is a branch of philosophy that tries to determine what things in life are morally good and which actions are morally right". He adds that "Invariably, all ethical question involves a decision about

what one should do in a specific instance…ethical questions are not concerned with what one would do but what one ought to do...". So, ethics deals with morality, but it is not the same as morality. Morality consists of the standards that an individual or a group has about what is right and wrong or good and evil (Velasquez, 2015:

489). More precisely, it shows that there is distinction between morals and ethics. Moral attitudes refer to the conduct or rule of conduct by which people live, while ethics refers to the study of moral conduct or the code that one follows. In the same vain, Conklin states that ethics is concerned with ideals, conduct and character (Conklin 1938: 265).

The dislocation of the modern man with morality has not essentially served for the social welfare. One may have recognised that the use of science without any ethics and for evil use threatens peace and progress; at the same time, they feel no responsibility to help avert disasters (Conklin, 1937: 595). In *Frankenstein* and *The Last Man*, Mary Shelley raises profound questions about the nature of life as well as our existence. What does it mean to be human and where do we draw the line between scientific and technological advances and our humanity?

With the crucial development in the history of nineteenth century, science is the establishment of distinct scientific disciplines, professions and roles. In Mary Shelley's novels the actions of characters who seek to control human's thoughts, bodies and attempt to control science; there is view of the relationship between science and ethics. A look at the moral standing of Frankenstein experimental efforts there is an indication that he goes through the same predicament as Leonel and his family in *The Last Man*. In *The Last Man*, the protagonist suffers the effects of scientific breakthrough through the reality of a contagion going on and meant to exterminate the entire world. The contagion is the omen of an all made plague that like Covid-19 is spreading in the society. if ethics was observed such things would not happen.

Victor Frankenstein with his creation oversteps the ethical boundaries that has caused unexpected and unwanted consequences. Frankenstein, a young scientist who becomes obsessed with creating life from a dead body, he wants to find a greater purpose of creating life as God. He associates himself with those who try to become God. He becomes captivated by his masterpiece. Thus, for him he could satisfy his self-interest in deepening his scientific and technological research. However, he has deviated.

People should not let their passions drive them to undesired situations. Ethically speaking, Victor should not have pursued his experiment, because he did not try to foresee the consequences that his performance could bring as good for his society.

"no debates serve to warn of the dangers or ethical implications of his intended experiments." (Hammond, 2004:190). The midst of any scientific experiment is that one should ensure the health and the safety of others first. Frankenstein would have contemplated some of dos and don'ts and he wouldn't have fallen in the trap that makes him run after creature to the North Pole on purpose to cancel it physically. Frankenstein could have judged and questioned his thoughts and abilities before. He is a self-centred person whose intention is based on fame and glory, all that interests him is to make his life as a powerful one. As he said: "So much has been done, exclaimed the soul of Frankenstein---more, far more, I will achieve; treading in the steps already marked, I will pioneer a new way, explore unknown powers, and unfold to the world the deepest mysteries of creation." (*F*: 27). Frankenstein believes in his capacities by experimenting without the assistance of someone. His intention is ruled by his egoism. He thinks to gain honour for himself. As he said: "A new species would bless me as its creator and source; many happy and excellent natures would owe their being to me. No father could claim the gratitude of his child so completely as I should deserve theirs." (*F*: 31). Frankenstein is aware of his selfishness. Psychologically his unconsciousness has led him to follow the evil way. He is psychologically overwhelmed and ruled by his desires. His ego takes over his mind; he fails to listen his consciousness. Man has to abandon some social beliefs and rule one's life with ethical safeguards for a good life. Therefore, instead of behaving immorally or having selfish intentions, one could think as an altruist person who cares for the welfare of others, but not creating monsters. Since Frankenstein does not think of others welfare, he says:

> Nor could I consider the magnitude and complexity of my plan as any argument of its impracticability. It was with these feelings that I began the creation of a human being. As the minuteness of the parts formed a great hindrance to my speed, I resolved, contrary to my first intention, to make the being of a gigantic stature, that is to say about eight feet in height, and proportionably large. After having formed this determination and having spent some months in successfully collecting and arranging my materials, I began. (*F*: 31)

Frankenstein challenges his first intention, which is to test his ability in creation. This quote shows his internal reflections, which determine his decision of confessing his creation. He knows that his eight feet large gesture can be dangerous. However, Frankenstein still keeps his desire. He just considers his first intention. By creating a monster, he causes fear to his society. If Frankenstein had thought deeply and thoroughly, he would have seen that it is a bad decision. If morality were incorporated

in his actions, there would not be the creation of monsters. Scientists seem not to take their responsibility on their imaginations. A responsible scientist would have considered the negative consequences his experiment would have. Questions as what will be the results of my actions? Does the decision I take is the right or the wrong? Does it serve the society? This is how scientific research sounds morally good. In the same view, Nagy. et al state that, "Frankenstein as a lens for understanding how people imagine science and technology invites the scientific community to discover new ways to reflect upon science, ethics, and responsibility." (Nagy. et al 2018: 17). Frankenstein application of science shows that science can solve problems but it also poses danger at the same time. Then scientific experimentations are not done at random but must imperatively reflect ethics. Any scientific research looking to human welfare and betterment must include ethics (Conklin, 265-266: 1938).

Mary shows that there is another chance for scientific performance improvement. Lord Raymond has revealed also a selfish behavior that does not reflect the ethical life. He was emphatically a man of the world. His passions were violent; as these often obtained the mastery over him, he could not always square his conduct to the obvious line of interest, but self- gratification at least was the paramount object with him. He looks on the structure of society as but a part of the machinery, which supported the web on which his life was traced (*TLM:* 179). Toward this unethical use and utilization of technological tools, Mary calls human attention. By the time Lord Raymond is involved in the Greeks and Turkish war, he could have thought of its negative results as well as the positive ones in advance. Using his moral sense, the dreadful effect of that war on the natural environment could have been avoid in adopting a meditative process. His failure in thinking about the tremendous negative effects of his set ambition is due to the lack of ethics, the plague had been avoidable. The diffusion of the flames, fires and pollution should have not been. The disaster caused by the war of conquest puts the reader in an embarrassing and questioning mood on the relevance war in the world. It is this feeling that Leonel has in the following extract:

I would not believe in his destruction; yet every mass that darkened the air seemed to bear with it a portion of the martyred Raymond. Horrible sights were shaped to me in the turbid cloud that hovered over the city; and my only relief was derived from the struggles I made to approach the gate. Yet when I effected my purpose, all I could discern within the precincts of the massive walls was a city of fire: the open way through which Raymond had ridden was enveloped in smoke and flame. After an interval the explosions ceased, but the flames still shot up from various quarters; the dome of St. Sophia had disappeared. Strange to say (the result perhaps of the concussion of air occasioned by the blowing up the city) huge, white thunder clouds

lifted themselves up from the southern horizon, and gathered overhead; they were the first blots on the blue expanse that I had seen for months, and amidst this havoc and despair they inspired pleasure. The vault above became obscures, lightning flashed from the heavy masses, followed instantaneously by crashing thunder, then the big rain fell. The flames of the city bent beneath it; and the smoke and dust arising from the ruins was dissipated. (*TLM*: 279)

In view of these chaotic pictures of the war and the plague, scientists must know how that curiosity devoid of ethics is catastrophic to humanity. Thanks to guns, war is nothing, but a destructive phenomenon to both humanity and the nature. Concentration upon our various specialties is essential, but it should not cause us to lose our sense of orientation in the world. In creating guns, gunpowder, man did not expect to such an event as wars. Ethically, it does not reflect the moral welfare of the society; therefore, there is a need to call for ethical scientific practices. These practices should be ethically conducted so that it could help. Scientists should recognize that they are intellectually endowed with reasoning, thus, one should care for that, leave the evil doings and use a good reasoning, by making sure that their actions are not wrong, or will not injure people; this is ethics.

The ethics of science regards the search for truth as one of the highest duties of man; it regards noble human character as the finest produce of evolution; it considers the service of all mankind as the universal good; it teaches that both human nature and humane nurture may be improved, that reason may replace unreason, cooperation supplement competition, and the progress of the human race through future ages be promoted by intelligence and good will…. (Conklin, 1938: 268)

This quotation clarifies the idea that the moral standards of oneself and the moral standards of his or her society for a promotion of a good future. In addition, one should be conscious of the bad effect of the scientific performance and further the progress of the human race. The relationship between ethics and science can cause many risks without regulation and proper course of action. Frankenstein oversteps the ethical boundaries that has unexpected and unwanted consequences. He has desired his creation with an ardour that far exceeded moderation but unfortunately the beauty of the dream vanished. As a result, his monster kills multiple people as Justine, and his young brother William.

In Leonel's own narration, there is the portrayal of a world in which the central conflict is about the extinction of the human race through disease. Man self-interest remains the very motive that push him to become a powerful person. Man claims a reinvention of the world and does not care about the consequences of his actions on nature. In

The Last man a picture of such a mindset is given when man is shown in a vain effort to pollute nature and intoxicate humanity. To this, Leonel has this to say:

> I remember, after having witnessed the destructive effects of a fire, I could not even behold a small one in a stove, without a sensation of fear. The mounting flames had curled round the building, as it fell, and was destroyed. They insinuated themselves into the substances about them, and the impediments to their progress yielded at their touch. Could we take integral parts of this power, and not be subject to its operation? Could we domesticate a cub of this wild beast, and not fear its growth and maturity? (*TLM*: 299)

From the lenses of new historicist who claim that "The literary text shapes and was shaped by the discourses circulating in the culture in which it was produced." (Tyson, 2015: 80). One can infer that the characterizations given in novels, replicate Shelley's own time, which can be distinguished from the romantic tendencies that are embedded in the industrial revolution; new machinery and the scientific explosion of industries which have led to environmental questions. The composition of the atmosphere and the properties of the gases have been ascertained and the ethical issue that has been drawn by scientists. It is obvious to say that Mary is influenced by her own time, especially with discoveries that she incorporates through her narration. Man's ambition is uncontrollable and is skipped by selfish researches. Humans are materially oriented until the injure nature. They do not confess for any judgement of their conduct, as Frankenstein. No one cares about others life. With regards to these effects, there is a need to be careful about what we are allowed to do and make sure they are always acting in an ethical and responsible manner so that we improve scientific advancement. The devastation of the disease in *The Last Man* is reflected as the cause of man's passion. The ills of society, like the diseases of the body, have natural causes and they can be cured only by controlling those causes. Man needs to protect his environment by applying the play game of the right and the wrong.

In fact, in the process of raising some interesting questions on the ethics manners, Mary does reflect the moral attitude toward her narrator who is Leonel. Shelley represents sympathy as a moral action and as an element of well-being. Leonel attempts to deploy sympathy to challenge the unethical view in order to eliminate any threat of the society. He says:

> As my authorship increased, I acquired new sympathies and pleasures. I found another and valuable link to enchain me to my fellow-creature, my point of sight was extended, and the inclinations

> and capacities of all human beings become deeply interesting to me….an anger aspirant to the praise and sympathy of my fellow. (*TLM*: 252).

This reflects ethics. Man's performance should call for the collective intention, for social ambition, not self-ambition. Leonel's intention is to produce the unified and morally to regulate communities. Several critics have suggested that in *The Last Man*, Shelley advocates for sympathy as a force of moral action and a solution to the interpersonal and international problems foregrounded in the novel. Fuson Wang for example, argues that "in *The Last Man* sympathetic social inclusivity constitutes "immunity" to the plague that kills off most of humankind." (Wang,2011: 233).

Sympathizing is what scientists are called for, any scientific, or individual experience needs to be collective. Humans' actions should be directed toward a collaborative work, not a self- work. Frankenstein longed for scientific assessment, implements it and goes beyond the limits of this knowledge and that becomes a danger for himself, his relatives and after for the whole world. He lost the value of the living in the society. If he had shared his secret to his family, this would not have happened to his society. As he still believes in his ego, he keeps it. Self-made decision guided his life. He sees even himself incapable to reveal the secret of his creation to his friend Clerval. All friendships do no more seem important to him. Such a move speaks volumes on the anti-social personality of Victor who instead of working for the society, rather works against it. Scientific thinks that all is allowed, such activity needs to be conducted socially and should be examined before its implementation. People should not allow their passions drive them to madness. In *The Last Man,* Leonel overwhelmed by the desolation of his world, has provided ethical rules or a mode of life that man should adopt, he says: "we should have considered more careful our future plans." (*TLM*: 397). Humans performed actions that are not really analysed, but ethics calls us to be aware of both the potentially positive and negative consequences of our research, which can be challenging in many cases. According to Conklin, "any program looking to human welfare and betterment must include both science and ethics, and there would be great gain for the world if organized science could cooperate more effectively in the promotion of practical ethics." (Conklin, 1938: 265-266).

This part has been devoted in demonstrating how important it is to adopt ethics in scientific or technological discovery. Ethics is there to promote morality and the right conduct of human being in the society. With regard to the egoistic and the scientific consequences that have been shown through characters, ethics is important for life improvement. If we have to create a harmonious society, modern man should combine his scientific research with ethics, which will restore morality for a stable life. Man is a

social being, therefore, any ethical decision, he or she makes has great consequences in society. Any decision making should be judged, various questions need to be asked so that we create a balance society.

## 3. Balancing Society and Scientific Breakthrough in *Frankenstein* and in *The Last man*

Access to scientific realities opens way to competences. It has a specific role, as well as a variety of functions for the benefit of our society, creating new know-how, improving education, increasing the quality of human life. In fact, society undergone a great development with the scientific and technological discoveries. Science has responded to some of the societal needs and global challenges that contribute to the improvement of the world. With science and technology, man has been able to create, or invent things that serves humanity.

Therefore, Scientists are endowed with the ability to perform any scientific experiments on purpose to improvement by creating and inventing the needs of the society. As a matter of fact, the advancement of science rests upon the freedom for scientists to seek, to text and reveal the truth. It is to be noted that scientists from their mentality have acquitted and put all their forces in the selfish discoveries and inventions. They really pursue is how to experience the knowledge that they get from science. Thus, scientific discoveries are revealed to be very far from the social needs. What they use to discover is not what people need for their well-being, what they do is to go beyond by exaggerating with some results that affect the society. These scientific discoveries said to be useful to society have turned to be a trauma.

Some of the scientific discoveries or inventions that we constantly create do no help or do not fulfil social needs. Rather, they constantly create things which destroy life itself and put into question what the future generations will expect to have as heritage. For instance, Frankenstein as a scientist, from his obsession has gone beyond ethics to find the secret of life; he devoted himself in getting scientific knowledge that push him toward a creation of a being that he had not imagined. A monster is a creation that Frankenstein has set to create for his society. But, does the society needs such a thing or a creation? It has become embarrassing and even a burden to the society instead of a solution. Scientists become obsessed by their dream, it is true that with science and technology, everything is possible, but it is not a reason to do things or create things that do not arrange the society. What they need to consider is what really the society is expecting from them. Frankenstein's monster becomes a danger and everybody in the society fears the monster. The creature is beyond the expectations of the creator. Frankenstein thought of bringing a solution to human nature in the world, but his lack of moral reasoning deviates his expectations. He

abandons his creature just because he himself is astonished of the creature that he creates. Fear and harmful situations are the life of people. Even the monster himself has complained for his rejection by human being because of his appearance. The monster by telling his story says:

> How miraculous did this appear! The huts, the neater cottages, and stately houses engaged my admiration by turns. The vegetables in the gardens, the milk and cheese that I saw placed at the windows of song of the cottages, allured my appetite. One of the best of these I entered, but I had hardly placed my foot with the door before the children shrieked, and one of the women fainted. The whole village was roused; some fled, some attacked me, until, grievously bruised by stones and many other kinds of missile weapons, i escaped to the open country... (*F*: 68)

From this extract, one can see that the monster is rejected by the society. Frankenstein's creation becomes a danger. He does not consider what the society wants. As a result, everywhere the creature goes, his appearance creates trouble to people. Frankenstein did not consider the future building of his actions; the society does not need such a thing. There is a need to use properly science and technology, question our daily inventions, and put things in right away. Contrary, self- interest governs the mind of Frankenstein; he ever thinks of the betterment. He himself qualifies his creature as a "devil" (*F*: 63). He recognized that his inventions should not be considered as part of the humanity. Let us consider what he says: "A flash of lightning illuminated the object, and discovered its shape plainly to me; its gigantic stature, and the deformity of its aspect more hideous than belongs to humanity, instantly informed me that it was the wretch, the daemon, to whom I had given life." (*F*: 47). Creating daemon is not good for the society. Rather we endanger the society. Society deserves improvement not destruction of the human race.

In fact, scientific discoveries are not the source of destruction but the transformation into technology makes of it so. Scientist's moral states do no more sound in our society. Everything is fulfilled just for self-honour while society is forgotten. In addition to Frankenstein, in *The Last Man*, Mary dramatizes how interpersonal conflict, socio-political injustices of violence, war, and other human made disasters creates pandemics. Mary's portrayal of the war between Greeks and Turks is the representation of the causes of scientific discoveries. The creation of scientific instruments as guns, weapons, and gunpowder are things that scientific enhancement has led to against the needs of humanity. Weapons lead to war and it is not what the society needs. May be man's discovery of these things, did not think of what it will

serve. Consequently, it has brought fear in the society; guns are used to kill people, to make explosion, even the nature is not spared from its pollution. Leonel describes:

I would not believe in his destruction; yet every mass that darkened the air seemed to bear with it a portion of the martyred Raymond. Horrible sights were shaped to me in the turbid cloud that hovered over the city; and my only relief was derived from the struggles I made to approach the gate. Yet when I effected my purpose, all I could discern within the precincts of the massive walls was a city of fire: the open way through which Raymond had ridden was enveloped in smoke and flame. After an interval the explosions ceased, but the flames still shot up from various quarters; the dome of St. Sophia had disappeared. Strange to say (the result perhaps of the concussion of air occasioned by the blowing up the city) huge, white thunder clouds lifted themselves up from the southern horizon, and gathered overhead; they were the first blots on the blue expanse that I had seen for months, and amidst this havoc and despair they inspired pleasure. The vault above became obscures; lightning flashed from the heavy masses, followed instantaneously by crashing thunder, then the big rain fell. The flames of the city bent beneath it; and the smoke and dust arising from the ruins was dissipated. (*TLM*: 279)

Mary has predicted the consequences of the mechanized weapons. The reflection of explosions, flames, smoke and dust are some of the consequences of using these technological instruments. Scientists should be able to distinguish what is social need and what are the scientific needs. Science is not there as knowledge to destroy the world but for social improvement. It also needs collaboration between people so that life could be forwarded. Scientific creation should favour a welfare of the society. Man through science creates things that the future race does not need and this becomes a problem. It always creates violent and social conflict, which absolutely influence negatively human life. Scientific tools should be the essential tools for the mitigation and prevention of the destruction of the society and the natural environment.

What scientists discover is not always what society needs. Scientists are too busy to take time to stop and think about the significance of what they are doing. Making creation or inventing is good but what should be created, what need is to be found as proper to human beings? Should we create thing that make fear, kill, or contribute to the destruction of the society as Frankenstein did. Or if we come into possession of the creation should we turn it badly toward the society? The Scientists are bound to their own view, spending time or making efforts to do carefully and deeply what society deserves. Therefore, scientific discoveries become as a waste for the society? Before trying to bring something in the world, it is important to analyse what is the need, for what purpose, and what is important so that the need of the society could be displayed.

Treating nonsense things will not lead the society to improvement. Frankenstein has created a monster which becomes a misfortune for his own life, for his relatives, family and his whole society just because he has not considered what his society really needs. Creating monsters is not welcomed in the society because it seems that these things have power than human. As what happened to Frankenstein when the monster tells him, "Remember, thou hast made me more powerful than thyself" (63) he adds "You are my creator but I am your master, obey!" (*F*: 111). The monster holds that he is the "master" and holds now all the power and knowledge. Why create things that control us? This kind of creation is unwanted to the society because it does not serve nor bring any benefit. Since Frankenstein has achieved his discovery, his life becomes a desolation, he says:

No one can conceive the anguish I suffered during the remainder of the night, which I spent, cold and wet, in the open air. But I did not feel the inconveniences of the weather; my imagination was busy in scenes of evil and despair. I considered the being whom I had cast among mankind, and endowed with the will and power to effect purposes of horror, such as the deed which he had now done, nearly in the light of my own vampire, my own spirit let loose from the grave, and forced to destroy all that was dear to me. (*F*: 47)

The discovery of Frankenstein is a creature as a badly made and unattractive human, whose tragedies are deepened. Frankenstein's selfishness has caused him death. Therefore, it is clear that man invents things that seem powerful to man himself. Frankenstein recognises by providing a sense of will and power to his horror. The monster represents the conscience created by Victor. The ego of victor's personality and the psyche experiences the external world and reality, through the senses that organizes the thought processes rationally, and that governs action. Creation resulting from scientific discoveries, which become a technology should be deeply reflected so that it could fill social needs and create a balanced society.

There is a gap in the scientific creation. Frankenstein may be compared of our endless monsters of the nineteenth century development. Today with science, we create robots; in medical domain, we create drugs, medicine, weapons with the idea that we are solving social problems but they end up creating trouble to us. Scientific discoveries have led to social development but some of the discoveries cause evil to society. The future generations deserve happiness instead of chaotic expectation. Every human action on earth must take into consideration the possible consequences it causes for a balanced society. As discussed in *The Last Man*, Lord Raymond has shown his power and rule thanks to scientific creation of his time. He believes in the scientific army and guns to do what the society fear. Scientists have created instruments and have not

considered to what utility and the services that it brings to humans. Man's passion is always directed towards curiosity and obsession. If today we have war and violence, is it because man has created arms, bombs, and machines that humans blindly deem to use them to kill other people or to do whatever they want. Moreover, scientific discoveries help in the overuse of natural resources which results in the increase of natural catastrophes. Society does not need things that cause diseases but things that can help to cure diseases. Man needs to be a collaborative person so that the world could have balanced.

Scientists have a number of different interests related to the conduct of scientific research that includes personal interests, such as fame, glory. These interests bring them in the pursue of advancing human knowledge by describing, explaining and predicting natural phenomena. Thus, they have to be aware that communities have an interest and they should fulfil their obligation in protecting communities from the harms that could result from their discoveries and inventions. From there, technological tools and inventions could fit with the social need. The usefulness of what scientists try to create or invent should create equal society whether they are moral or ethical, it is a must to promote goodness. Whatever they create, they should make sure that these things are solution or useful to society. For instance, it could help to raise humans' intellectual abilities, health care, environmental protection instead of destruction. For instance, experimenting things to raise intellectual property, health care, environment remediation instead of destroying the society.

Designing studies that focus on scientific and public health issue or experiment that focuses on meeting society values or perceived society needs can create a balance society; not in creating arms, guns, monsters and diseases that can create disasters for people. As in *The Last Man*, disease has caused the extinction of humanity thanks to man's deviation in his use of scientific knowledge. Hunt clarifies it by saying: "The plague function more as a capacious symbol of varieties of human- made destruction than as an actual pathogen." (Hunt, 2022: 3). Shelley's demonstration of Frankenstein's experimentation and the disease in *The Last Man*, recalls to all scientist about the effect that could result from the mishandling of scientific knowledge. Frankenstein himself vows the following: "how dangerous is the acquirement of knowledge." (*F*: 31), acquiring knowledge and not using it carefully is dangerous. This confirms that to avoid any consequence or any destruction of the society, there is a need that science and technology should deeply abide by a collective interest and value science as well the community. Shelley addresses this: "Farewell to the giant powers of man, to knowledge that could pilot the deep-drawing bark through the opposing waters of shoreless ocean, ---to science that directed the silken balloon through the

pathless air, and vast machinery, that could divide rocks of granite or marble, and make the mountains plain!" (*TLM*: 357). It is important to free ourselves from some mechanizations that cause trauma in order to avoid the different unvalued and dangerous problems. Moreover, there is a need to call for a balance and promote happiness for everyone.

This section has been devoted in discussing the moral side and ethical issue that should be encountered in scientific and technological experimentation. Therefore, it has claimed the existence of a balance between scientific discoveries and the needs of the society. Then the need to reevaluate our way of creating and inventing in society is called upon us. To avoid a perverted science, scientist need to be altruistic, should never direct their researches to unethical purpose. To seek truth not only for truths sake but also for humanity sake.

# 4. Conclusion

This paper has looked at the representation of the method of scientific and technological achievement and their limits. It has been devoted to the discussion of the moral side and ethical issue that should be encountered in scientific and technological experimentation. Also has claimed the existence of a balance between scientific discoveries and the safety of the society.

From Mary Shelley's analysis, it has been posited that the quest of knowledge and its applied uses can result in alienation and generate hardships to mankind as it is highlighted in the desperate commitment of the protagonists to destroy what his own wits have created. Thus, any scientific research should be needed to seek truth not only for truth sake but also for humanity sake because the acquisition of scientific knowledge is good but its technological transformation causes its perversion. An ethical guidance of its implementation can favour its goodness

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