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**TIME, TERROR AND THE TECHNOLOGICAL  
IMAGINATION:  
FRANKENSTEIN'S FICTIONAL LEGACY IN THE  
SCIENTIFIC AGE**

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of the requirements for the degree of**

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## **ABSTRACT**

There is a long-standing belief that there is an opposing discourse between science and the humanities in relation to the future of humankind. Attitudes towards the environment have changed radically in the last 200 years from a natural view to one where we dominate and re-order our environment to suit ourselves and to further the material self-interests of human beings, regardless of cultural and ecological consequences. In order for human beings to properly understand what is happening and why, we must begin to restore the balance between our relationship with Nature and our new technological worldview.

The Introduction firstly addresses issues relating to the changing relationship between human beings and their environment over the last two centuries, and how literature and film have accurately predicted our collective future. It is my objective to illustrate how Mary Shelley's *Frankenstein* has remained one of the most potent pieces of literature foreshadowing the future of humankind, and the timeless quality of the theme of the controller out of control.

The main text focuses on Mary Shelley's *Frankenstein*, and how the novel embodied humankind's growing anxieties and fears about our technological ambivalence, and I give an overview of how *Frankenstein* has paved the way for further literary and cinematic predictions of our future in artificial and synthesised environments dominated by the new frontier of genetic engineering, artificial intelligence, virtual reality and beyond, and how these technologies will impact on our cultural worldview and the future evolution of humankind.

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## INTRODUCTION

Humans have always had a love/hate relationship with the tools we have created. We are enchanted with the prospect of the benefits of genetic engineering, thinking machines and entering virtual worlds. Yet frequently we are warned by detractors of this new technological worldview that these new technologies may bring about our obsolescence.

Frequently the most profound and potent insights into how technology will impact on culture stem from the literary and cinematic genre of science fiction. Critics of the science fiction genre note that that often our attitudes towards technology indicates “both an invitation and a warning; it is simultaneously fascinating and threatening, both superior to and somehow inferior to the punier humans who build, operate and are sometimes subjugated by it.”<sup>1</sup>

Mary Shelley’s *Frankenstein* represented a “peak of fear”<sup>2</sup> not only that the technology we create will harm us, but that it will eventually supplant us, making humans redundant. In this study I am primarily concerned with the dystopian vision that has evolved in both literature and cinema directly from Shelley’s *Frankenstein*: more specifically how these literary and cinematic texts have successfully predicted the future of humankind.

*Frankenstein*’s premise is that a being created using groundbreaking technology takes on a life of its own, surprising an unsuspecting creator, who quickly loses control of the being he created, leaving the roles of master and slave in doubt. Most importantly, the Doctor defies the Gods and the laws of Nature.

This dissertation does not set out to be a study in literary analysis or cinema criticism. It does not analyse each and every film theory or elaborate special effects techniques employed within films that may be in some way relevant to my topic. The impact of technology upon human values is a well established theme in media studies; indeed, it forms the backbone of what is today called media ecology. This dissertation draws upon that extensive literature in order to contextualise and prioritise these pressing issues.

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<sup>1</sup> Rushing & Frenz. *The Frankenstein Myth In Contemporary Cinema*, 61.

Accordingly, I have selected specific texts that highlight and illustrate specific themes pertinent to my argument.

Throughout modern history the Arts have been trying to tell us something about the human condition; more specifically our relationship with Nature, and how this relationship determines the future of human evolution and progress. Artificial humans, robots and computers capable of thinking for themselves have dominated our screens for decades. Literature and film has had a lot to say about the irrepressible human desire for progress. This dissertation focuses on dramatic shift in our worldview, and the ways in which the selected texts have accurately predicted the future of humankind and our growing ambivalence towards the unrestricted progression of science and technology.

In the nineteenth and twentieth centuries the possibility of scientific tampering with the human body and mind broached the ethical question of whether or not humankind would benefit from such techniques. These dilemmas are important themes addressed in *Frankenstein*. Shelley wrote in a period when the ‘hard sciences’ were still considered a branch of philosophy, but were rapidly developing into disciplines of their own, with breakthrough discoveries occurring at a rate that foreshadows the explosion of knowledge of our own day.

The aims and character of human development and progress are being fundamentally transformed before our very eyes. Our fascination with Shelley’s classic tale is timeless, and perhaps even more relevant today in an age dominated by science and technology. *Frankenstein* explores the limits of the new sciences and questions the ethics associated with the human desire to play God. We have not yet learnt how to appreciate the ramifications that unimpeded experimentation with these new technologies could have on the entire human race. It is impossible to see where the fruits of such experimentation may fall.

One of the most common themes of the science fiction genre since the 1950s has been that modern science will either save us or destroy us. However, a distinct change in the social and cultural climate since the genre’s pinnacle in the ‘50s has seen this theme

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<sup>2</sup> Rushing & Frenz. *The Frankenstein Myth In Contemporary Cinema*, 61.

approached in a different fashion, and as a result the audiences going to see these films has changed. Sociologist Fred Glass observes “in particular, nuclear, computer, robotics, communications and gene-splicing technologies have advanced far enough into the daily lives of large segments of the US population that social and psychological issues have emerged – both for individuals and the broader society – that require narrative symbolisation. The new science fiction films seek at various levels to meet these needs.”<sup>3</sup>

We are becoming further and further immersed in an environment dominated by technology and genetic engineering. Our world is becoming denaturalised at an alarming speed. Humankind faces the risk of falling under the control of the technology we have created: the controller slowly but surely losing control, suffering the repercussions of decades of technological ambivalence.

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<sup>3</sup> Glass, Fred. *Science As Culture*, 7.

# **CHAPTER ONE: THE WORLD AS WE KNEW IT**

## **IN THE BEGINNING...**

**“Learn from me, if not by my precepts, at least by my example, how dangerous is the acquirement of knowledge and how much happier that man is who believes his native town to be the world, than he who aspires to become greater than nature will allow.”<sup>4</sup>**

A great deal of art and literature through the ages has been inspired by the natural world. Both ancient and modern religions are deeply rooted in Nature. The humanities and literature have something significant to say in the ongoing debate about the demise of our relationship with Nature, and the increasing role of the sciences in our day-to-day lives. Countless works of fiction and their cinematic adaptations not only offer predictions about the future of the planet and of humankind, but have also helped shape the nature of the scientific and technological development that we are seeing unfold before us today. These texts have retained undeniable relevance and potency in the age of genetic engineering, artificial intelligence, virtual reality and beyond.

The aims and character of human development and progress is being fundamentally transformed and manipulated before our very eyes. Twenty-five years ago, the term genetic engineering was something few people had heard of let alone understood. Many critics of the new technology swept aside any doubts they had regarding the possible negative outcomes of biotechnology. They believed that the use of this technology was at least a hundred years away. And yet at the dawn of the twenty-first century animals have been cloned (and even possibly the first human), and the human genome is being mapped with the help of supercomputers. Our environment is rapidly becoming less and less natural more synthetic. Humankind is becoming controlled by what it has created. The *controller* is rapidly losing control.

In order to properly understand the place of humankind in Nature and the relationship we have with our environment, and the way in which we manipulate this relationship to our

advantage, we need to search the humanities, specifically classical references and literature. Modern film, especially the science fiction genre, also offers a number of suggestions regarding the complicated and tumultuous relationship between humans and their environment. For decades cinema, in a sense our collective dream life, has been telling us a great deal about our future. Literature and film that approaches the controversial topic of the creation of artificial human life, from the myth of Prometheus to Pinocchio to *Gattaca* and *The Matrix*, have challenged the very idea, let alone the idealism, of humanity in its natural form.

However, the answers we are looking for would be incomplete without the help of the sciences to properly illustrate what we know about the physical and biological nature of our environment. In this case both of these very different streams of thought and theory are complementary; subjective and objective approaches together paint a more complete picture of humankind's relationship with Nature. The analysis of data is the task of scientists, whereas evaluating our reactions and feelings towards this debate is the realm of the humanities. Among various other topics, the humanities convey the way in which humans perceive their place in Nature, and the way they interact with it. Sociologists Schneider and Morton advocate that "we need to analyse our feelings about Man's place in Nature before we can properly understand our present environmental and related technological crisis, for these emotions are the driving force behind the changes that can create or alleviate such crises."<sup>5</sup>

Cinema effectively embodies many aspects of the modern, western worldview. The perception that we now have of ourselves is nothing like the way we saw ourselves a thousand years ago. Humankind presented and perceived itself in several varying dimensions; we had a multi-perspectival perception. This is no longer the case. Modernity put an end to this. Science and technology have provided us with a new worldview that has seemingly surpassed and replaced faith and religion. Yet in an attempt to comprehend the ever-changing, technology-driven environment in which we live, we continue to turn to the humanities, namely literature and film, in an attempt to try and understand what is unfolding around us, and to perhaps even catch a glimpse of our uncertain future.

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<sup>4</sup> Shelly, Mary. *Frankenstein*, 313.

Katherine Newey<sup>6</sup> evaluates the relationship between the humanities and the sciences, commenting “in the last years of the twentieth century sciences and the humanities are represented in opposite terms: the study of literature is seen to be subjective and interpretative, while scientific studies are apparently rational and objective. As readers of literature, apart from appreciating the conveniences of advanced technology, we tend to be distanced from the philosophy and practice of science, and the study of literature and are generally seen as separate pursuits.”<sup>7</sup> Literature has offered a number of predictions for the future of the sciences and humankind whole.

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<sup>5</sup> Schneider and Morton. *The Primordial Bond: Exploring The Connections Between Man and Nature*, 78.

<sup>6</sup> Newey is a renowned literary critic and Lecturer of English at Wollongong University in New South Wales, Australia. One of her areas of expertise is Mary Shelley’s *Frankenstein*.

<sup>7</sup> Newey, Katherine. *Mary Shelley’s Frankenstein*, 16.

## THE TIME IS NOW

**“All of our perceptions of self and world are mediated by the way we imagine, explain, use, and implement time. Time is at once both dazzling and versatile, enigmatic and vexing. We can look ahead of ourselves, we can steal our way back into the past, and we can detach ourselves from the moment and look at ourselves from a distance. Our clocks and schedules, our science and technology, allow us to leap on top of the undifferentiated tempos of the biological and physical world.”<sup>8</sup>**

Rhythm is the most central and most basic human experience. Time and rhythm are the crucial factors that permeate our biological systems governing our entire existence. Time measures and orders our personalities and behaviour: it is a powerful force behind the creation of cultures. Despite the central role that time plays in our daily lives, humankind is becoming increasingly ambivalent towards the concept of time. Calendars, clocks, schedules and computers largely govern the environment in which we live. However, we are often unaware of the fact that machines of one sort or another already largely control our lives. Only by comparing the relationship that we have had with biological time and rhythm can we fully understand and appreciate our relationship and perception of time in the present.<sup>9</sup>

The artificially accelerated pace of our culture has brought about the alienation of humans from the rhythms of Nature, rhythms which once ordered many aspects of human life. This gap between humans and their environment only continues to widen. Our ancestors once listened and adhered to the rhythms of Nature, using these rhythms as patterns to live by. They were once in tune with the rising and falling of the tides, the lunar cycle, the rising and setting of the sun, and the changing of the seasons. Instead of following such natural guidelines about how to live, we have evolved into a society rigidly controlled by a vast array of time-keeping devices which control the way that we live a great deal of our lives. This has resulted in a fast, efficient, safe and overly predictable existence.

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<sup>8</sup> Rifkin, Jeremy. *Time Wars*, 9.

<sup>9</sup> Rifkin, Jeremy. *Time Wars*, 5.

Jeremy Rifkin<sup>10</sup>, renowned biotechnology critic and President of the Foundation on Economic Trends, has been a strident voice on the issue of genetic engineering, from the genetic enhancing of crops to the patenting of genes. He has written 16 books to date dealing with the impact of scientific and technological changes on society, the environment and the economy. One of Rifkin's more recent books, *The Biotech Century*, addresses future trends in science and technology, specifically biotechnology. Rifkin insists "The modern age has been characterised by a Promethean spirit, a restless energy that preys on speed records and shortcuts, unmindful of the past, uncaring of the future, existing only for the moment and the quick fix. The earthly rhythms that characterise a more pastoral way of life have been shunted aside to make room for the fast track of an urbanised existence. Lost in a sea of perpetual technological transition, modern man and woman find themselves increasingly alienated from the ecological choreography of the planet."<sup>11</sup> Rifkin advocates that in our haste to become as technologically advanced as we possibly can, we have lost touch with the Earth's natural rhythms, instead becoming dependent on the machines we ourselves have made to run our lives as efficiently as possible. Our relationship with Nature, once an unbreakable bond, has faded away. Nature has fallen victim to human ambition, power and the overwhelming human desire for knowledge.

Schneider and Morton, on the other hand, suggest that although these new technologies are becoming an integral part of our collective existence, it may be extremely difficult, if not impossible, to break our bond with Nature. "Are we decoupling ourselves from the natural world, substituting instead the emoluments of a technologically *advanced* culture? Our mechanical and electronic gadgets are some of the most obvious symbols of this attempt at separation. But are they merely new symbols in a futile, old pattern in which other *objects* – gods to be placated, for example – had the central role? Are we attempting the impossible by trying to extricate ourselves from a bond in which we are inextricably bound? And will we degrade the quality of our environment in the attempt? Might we even threaten our own survival?"<sup>12</sup>

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<sup>10</sup> Rifkin's books have proven to be a rich source of information for my dissertation, and I make regular references to several of his more renowned books throughout this dissertation.

<sup>11</sup> Rifkin, Jeremy. *Biotech Century*, 21.

<sup>12</sup> Schneider and Morton. *The Primordial Bond: Exploring the Connections Between Man and Nature Through the Humanities and Science*, 5.

Each individual culture has its own individual set of temporal rhythms, which defines that group and the way in which they live. “Our clocks and schedules, our science and technology, allow us to leap on top of the undifferentiated tempos of the biological and physical world. We ride hard on the periodicities of Nature. We tame, harness, and regiment. We brand our temporal biases onto the ancient rhythms of the universe, in hope of sequestering time, the elusive phenomenon that always seems to escape our grasp.”<sup>13</sup> It is virtually impossible to properly understand our respective cultures and ourselves if we do not properly understand the way in which we perceive time. Time defines our existence; therefore we need to define time.

Time is a dimension of reality that humans have never quite been able to tame and manipulate to their advantage, so that the theoretical compression of time has become one of the great desires of Western civilisation, and indeed a majority of the developed world. Time is now perceived as a rare and precious ‘resource’ that can be used to shape cultures in new and more efficient ways; time has become a tool with which we can enhance our own well-being, along with the well-being of our respective cultures.

As we become further embedded in our high-speed society a growing number of groups are offering alternatives to this artificially accelerated environment. Rifkin comments “these heretics are challenging the notion that increased efficiency and speed offer best time values to advance the well-being of the species. They argue that the artificial time worlds that we have created only increase our separation from the rhythms of Nature. They would begin the process of reintegrating ourselves back into the periodicities that make up many physiological time worlds of the earth organism.”<sup>14</sup> These groups are not interested in assuming power over time; instead they advocate the reunion of the bond between humans and Nature. By understanding and following the natural rhythms of the planet we are able to offer humankind real hope for the future.

Ancient civilisations perceived Nature as a powerful force to be treated with great respect, as it was crucial to follow the rhythms of Nature to ensure the survival of the species. Nature was a powerful force that humankind did not fully comprehend, and was therefore treated with respect, as the laws of Nature were not to be tampered with by

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<sup>13</sup> Rifkin, Jeremy. *Time Wars*,10.

mere mortals. The most obvious difference between the ancient and modern worlds is that ancient civilisations had a much greater dependence on the natural world as well as a much stronger bond and intimacy with natural cycles. “To early humans, without scientific knowledge and with a very simple technology, Nature was a formidable ‘Other’. From the vantage point of early scattered groups of human beings, Nature was a vast, mysterious, dangerous, and uncontrollable force, which humans, unable to live without chaos, anthropomorphised. In other words, humans created a counter-intellect to mirror their own. They populated Nature with gods, monsters, spirits, trolls, mermen, and other humanlike, but not quite human, creatures.”<sup>15</sup>

It is likely that hunter-gatherer groups saw Nature as a benevolent force. These groups were dependent on a balance in Nature; if they depleted their resources, they faced shortage in the future, placing their very existence in jeopardy. The development of agricultural societies marked a significant move away from humankind’s complete dependency on the forces of Nature. These societies, which were more technologically advanced, did not work in harmony with Nature, but instead tended to view Nature as a dangerous force that put their new lifestyle and cultural practices in jeopardy, and therefore attempted to confront and control Nature. As a result, the Agricultural Revolution was an attempt to harness Nature by having the land carved up and transformed into a cultural space for development. Creatures of folklore, such as fairies, dwarfs, and pixies symbolised the uneasy relationship that existed between Nature and the emerging agricultural societies. These beings personified the unpredictable forces of Nature that could not be tamed, but more importantly they indicated that humankind was still subordinate in relation to Nature. Although the Agricultural Revolution was seen as a great step forward for human progress, humankind was no longer living in harmony with Nature.

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<sup>14</sup> Rifkin, Jeremy. *Time Wars*,15.

<sup>15</sup> Schelde, Per. *Androids, Humanoids And Other Science Fiction Monsters: Science and Soul in Science Fiction*,14.

## A NEW WORLDVIEW: DAWN OF THE SCIENTIFIC AGE

The scientific worldview did not properly emerge until the second half of the nineteenth century. Science explained complicated phenomena in entirely new terms: those of chemistry, biology and physics. Most importantly, science explained events in terms of cause and effect. Science was the power that began to destroy the bond between humans and the deities and the supernatural, and the once strong link between humans and their environment was changed forever. Humans rapidly found that with their scientific knowledge they had acquired a new power, and Nature was steadily pushed into a subordinate role. Man used his gift of ingenuity to expand his strength against Nature. “Ingenuity has been used to figure out new technological *weapons* to field in the constant warfare. Each of these *weapons* – the plough, the steam engine, and so on – has allowed humans to multiply and to carve out a bigger piece of the cake. The bone of contention has always been *knowledge*. Super naturals and gods had knowledge and powers denied to humans, but humans had intelligence and determination to use to acquire that knowledge and that power. The root of the conflict is the human desire to become more knowing, more powerful, and more ‘godlike’.”<sup>16</sup> With the conception of the new sciences, human ambition became a force to be reckoned with. Humankind was no longer content to succumb to the unpredictable forces of Nature. After the Industrial Revolution, a period commonly referred to following as the Age of Reason, modern culture continued to make rapid progress in scientifically based research. This increase in knowledge also brought about an increase in power. The gods were still acknowledged as the creators of life and human existence, the ones who determined the fate of human beings. Everything else became the property of science and technology, and ultimately human intelligence.

In an essay written in the early 1940s, Edwin Schrödinger raised the awkward question about the real purpose and benefit of scientific research. “Everybody knows that in our days more than ever before a man or a woman who wishes to make a genuine contribution to the advancement on science has to specialise: which means to intensify one’s endeavour to learn all that is known within a certain narrow domain and then to try and increase this knowledge by one’s own work – by studies, experiments and thinking.

Being engaged in such specialised activity one naturally at times stops to think what it is good for. Has the promotion of knowledge within a narrow domain any value in itself? Has the sum total of achievements in all the several branches of *one* science: say of physics, or chemistry, or botany, or zoology – any value in itself – or perhaps the sum total of the achievements of all the sciences together – and *what* value has it?”<sup>17</sup>

Many people respond to this type of question by listing all of the great scientific and technological achievements that have been made over the last two centuries; achievements that have transformed almost every aspect of our lives. Yet we must also ask ourselves whether these achievements have actually enhanced the existence of human beings, and more importantly, where they will lead us in the future? One of the greatest fears regarding the acquisition of too much scientific knowledge is that it will irreparably damage humanity and the natural order as we know it, ultimately destroying our bond with Nature, and our traditional religious and cultural beliefs.

As we face the uncertainties of the new millennium, one thing seems certain: biotechnology will become a prominent power in the new era driven by technology. Claims have been made by assorted scientists that we will soon be able to re-create the human race, enabling the entire human race to be as close to ‘perfection’ as possible. We will be able to engineer human beings, and develop new hybrid species unlike anything we have seen before. Natural selection and selective breeding will become a thing of the past in the face of these new technologies. We will finally be able to combine our biological and cultural evolution and seize control of our collective future. These incredible advances in scientific knowledge and methodology will fulfil the prediction of the Age of Enlightenment that progress in scientific discovery will lead to all things becoming possible. It seems that the only thing to limit human progress will be our imaginations.

Despite the fact that the prospect of these developments excites many people, there is still the persistent fear that it will all turn bad. Over time we have become ambivalent about the unrestricted use and long-term impact of biotechnology. Great benefits may be

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<sup>16</sup> Schelde, Per. *Androids, Humanoids And Other Science Fiction Monsters*,15.

reaped from such techniques, but these may be greatly outweighed by the number of risks: risks that lurk constantly at the back of our minds. These are the same risks that we have seen unfold before us in countless science fiction films and literary works. As these new scientific techniques evolve from potential to real technologies, our irrepressible fears about the possible outcomes of these unpredictable scientific methods lead us to a classic tale written nearly two hundred years ago.

Mary Shelley's *Frankenstein* is widely acknowledged by critics and historians alike as a potent warning against the fate of humans who reach too far and push the boundaries of science beyond their own grasp in an attempt to satisfy their own desires in the quest for knowledge, fame and notoriety.

*Frankenstein* has transcended the gothic and horror genres and has been adapted into countless plays, films and countless sequels, yet our fascination with Shelley's timeless classic continues, even more so in an age governed by science and technology.

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<sup>17</sup> Schrödinger, Erwin. *Science and Humanism: The Spiritual Bearing Of Science On Life*, 110. Although this essay was first published in the 1940's, Schrödinger still recognised the potential problems the impact of the sciences would have on human life.