

# Boundary Transgressions

## The Human-Animal Chimera in Science Fiction

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### ABSTRACT

*This paper explores how science fiction writers have used human-animal chimera experiments as the inspiration for creating characters that challenge us to consider what is quintessentially human and what is animal. Since Mary Shelley's "Frankenstein" (1818) created a manufactured man from parts of dead animals and humans combined, and H.G. Wells wrote about vivisection used to create the Beast Men in "The Island of Dr. Moreau" in 1896, animal experimentation has been mirrored in science fiction. Xenotransplantation is used with tragic-comic effect in Mikhail Bulgakov's long banned 1932 novel "A Dog's Heart", and with pathos in Malorie Blackman's 1997 children's novel "Pig Heart Boy". Shostakovich's recently resurrected 1932 satiric opera, "Orango", explores the results of doctors inseminating female primates with their own sperm. In Vincenzo Natali's 2009 transgenic science fiction horror film "Splice", Dren – the ultimate chimera – is created by scientists Clive and Elsa splicing multiple animal and human DNA. As Donna Haraway predicted in "A Manifesto for Cyborgs" (1991), "[b]y the late twentieth century [...] nothing really convincingly settles the separation of the human and animal". In investigating the manufactured human-animal chimera as a cyborg, the literary trope of the mad scientist that emerged with Frankenstein is examined.*

*Keywords:* Human-animal studies, human-animal chimeras, science fiction, animal experimentation, Donna Haraway, Mary Shelley, H.G. Wells, Malorie Blackman, Vincenzo Natali, Mikhail Bulgakov.

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### 1. INTRODUCTION

Science fiction is created not in a vacuum, but in parallel with scientific achievements and research. While human-animal chimera experimentation provides us with compelling representations of human identity in a biotechnological age, it also reveals deep levels of speciesism. Novels about

chimeras highlight how humans experiment on animals without regard to their own needs, safety or comfort. Authors take the reader into laboratories to show them scientists “taming” and altering and augmenting the animal body. The scientists’ aim in the case studies I explore in this paper is to create a blend of human and animal that uses the qualities humans admire and envy in the other species. Instinct, strength and heightened senses are seen to accentuate the diminished qualities of the rational “civilized” human. Yet in molding and breaking the animal spirit and shaping the resulting chimera, scientists claim sovereignty over the chimera’s body. Similarly, in science, human-animal chimeras have become objects of property, as well as objects of ethical controversy, depending on whether they are seen to be human, or non-human (Hinterberger 2011). With the rise of the creation of chimera embryos for stem cell research, there has been widespread use of animal eggs in the process, whereas human eggs are deemed rare and precious. When it comes to medical experimentation, all parts of the animal are considered by humans to be disposable.

In investigating the relationships between scientific experiments on the human-animal chimera and the representation of those experiments in science fiction, what may be revealed when the texts fictionalize the topic of interspecies hybridization between the human and the animal?

In this paper, I will focus on several human-animal chimeras in science fiction. These characters are fictional responses to developments in science that pushed the boundaries of what humans perceive to be “human”. They also reveal a discourse about race and gender politics (Squier 1998). The attitudes to the chimera, revealed through the literary trope of the mad scientist, epitomize human arrogance towards nature and scientific hubris.

Ever since Mary Shelley’s monstrous creature terrified readers in her 1818 novel *Frankenstein*, the human-animal chimera has caused fear and revulsion in humans, while the trope of the mad scientist has embodied for the reader the anxiety created by the ethical conundrums of scientific endeavor – on one hand pushing known boundaries to extend human life and knowledge, on the other, creating chaos through blindly experimenting with the fundamental core of human existence in the pursuit of corrupt ego-driven personal desires. I will explore several science fiction texts that give a voice to the chimera, a manufactured hybrid deemed by society as a monster that should not exist. The chimera, partly human, like us, is also animal. The chimera therefore disrupts the duality of the species as we know it. I argue that our relationship with animals explored in science fiction gives us vital clues to how we view our own humanity and superiority as a species. It is no coincidence that some of the most disturbing science fiction has its roots in scientific experiments. As I will explore in this paper,

from Stalin's sanctioned program of inseminating women with primate semen to create super soldiers, to scientists creating human-animal chimera embryos in British laboratories, science fiction has given a narrative to the possible consequences of its great plans, bold imaginings and ever increasing push to challenge the boundaries of what we know.

## 2. METHODOLOGY

How may we understand the attraction and revulsion reflected in the characterization of a human-animal chimera in science fiction? To do this I will apply insights from the work of Donna Haraway, who identifies in her influential 1985 essay *A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century* a set of criteria for cyborg existence. According to Haraway, a cyborg is a hybrid that challenges the distinction between the organic/technological systems, human and animal life forms, mind/body and male/female. Calling the cyborg "a creature of social reality as well as a creature of fiction", Haraway points to the fact that cyborgs have both a real and imagined context (1991, 149). While Haraway uses the ironic metaphor of the cyborg to suggest a new way of constructing ideas of feminism outside traditional ideas of the women's movement and politics, in *A Cyborg Manifesto* she sets out detailed theories about "the cyborg incarnation" (Haraway 1991, 7-46).

I identify the human-animal chimera in science fiction as a cyborg, according to Haraway's manifesto. I argue that Haraway's cyborg theories are valid ways of understanding the chimera in science fiction.

Haraway explains that one of the first crucial boundary breakdowns necessary for the appearance of the cyborg is the breakdown of the boundary between human and animal (Haraway 1991). I will now explore how scientific experimentation between species is instrumental in the disruption of long established species boundaries in the following textual case studies of science fiction works.

Mary Shelley's *Frankenstein* heralds the start of an investigation in fiction about the scientific impulse to create chimeras (Squier 1998; Hefernan 2003; Clayton 2007; Ferreira 2008). H.G. Wells' novel *The Island of Dr. Moreau* (1896) anticipates certain key developments in late-twentieth-century molecular biology and speculates on the possible consequences of this scientific research (Danta 2012). Mikhail Bulgakov's 1932 novel *A Dog's Heart*, Dmitri Shostakovich's recently resurrected 1932 satirical opera, *Orango*, the *Pig Heart Boy* a children's novel by Malorie Blackman that was first published in 1997 and Vincenzo Natali's 2009 transgenic

science fiction horror film *Splice* all make imaginative use of the scientific procedures of their time, such as vivisection, xenotransplantation, experiments in hybridization between human beings and apes, and the creation of cybrid (human-animal) embryos through biotechnology.

I argue that the depiction of the chimera illustrated in these case studies displays the anxiety about the notion of what is considered human. Here the chimera is a symbol of the disrupted boundary between not just the animal and the human, but of the fragmented modern identity. The chimera's sexuality also blurs species boundaries, resulting in moral dilemmas with other characters. Dren in *Splice* disrupts the accepted human cultural boundaries, resulting in transgressive sexual activity with her parents that forces viewers to confront taboos such as bestiality and incest.

In these case studies, the eventual fate of the chimeras, through either death or devolution, epitomizes the cultural acceptance and presumed inevitability of animal sacrifice. It also points to their liminal status as persons. In *Chimera and the Continuum of Humanity* D. Scott Bennett argues that personhood is the necessary threshold requirement to the application of specific constitutional rights and therefore personhood of various types of chimera is crucial: "Given the state of chimera technology, the division between human and animal has become a continuum not a bright line" (Bennett 2006, 349).

While the trope of the mad scientist traces its roots to the clinical association between genius and insanity that developed in the mid-nineteenth century (Stiles 2009), I argue that the literary trope of the mad scientist that is revealed in the following case studies embodies the desire of the human to push the frontier of what it means to be human. For theorist N. Katherine Hayles, the posthuman does not mean the end of humanity but signals the end of a certain conception of the human, one that had the privilege of agency and choice in the first place (Hayles 1999, 286).

The word trope has a broad meaning, standing for any recurring feature, term or image in a text, a genre or culture (Fahnestock 2011, 100). Patterns or conventions in storytelling, noted by the philosopher Aristotle, are shorthand for concepts that readers will instantly recognize. Haraway argues "tropes are what make us want to look and need to listen for surprises that get us out of inherited boxes" (Haraway 1991, 32).

In the following case studies, the trope of the mad scientist is revealed in different ways. Crucial is the purpose for which the chimera is created. Do they wish to create a chimera to rid the human of undesirable qualities? Breed a race of super humans who are the ultimate aggressive soldiers by using the improved physical traits such as superior ocular, auditory and sensory capabilities from animals? Or to rid the human of their aggres-

sion? Likewise, it is relevant if the scientist draws on the conceit of human mental superiority and rationality in proposing that the chimera would be enhanced with human characteristics deemed superior, such as cognitive capabilities, language and consciousness that it is believed are not found in animals.

For ethicist Julian Savulescu, the initial moral or ethical intent involved matters to the chimera's eventual fate. He argues that while creating human-animal chimeras may be questionable, it may have value in medical purposes, in delaying aging or prolonging human life or by enhancing human capabilities (Savulescu 2003). Here we see the imperative to create the chimera from the human perspective and not the animal.

The desire to preserve separate categories for animals and humans that are now being extinguished in biotechnology is one that can be traced back to the middle ages. When early Christian thinkers established what they believed to be clear categories that separated animals from humans, they not only were making a theological statement of humanity's dominance over the natural world but were actually defining what it meant to be human (Salisbury 2011).

In the 21<sup>st</sup> century, with biotechnology and transgenic animals and the creation of human-animal embryos for research purposes, the boundaries between animal and human are now called into question. Statistics reveal that only 5% of DNA separates all known genomes, the uniquely human part of which is limited to 0.1% (McHugh 2006, 67). Concerns about hybridity and an anxiety of race and species reveal a preoccupation with issues of origin and hierarchy and purity of species (Squier 1998) despite the fact that animals have increasingly been reconstituted through increasingly exotic genetic crossbreeding and the industrial production of meat (Cole 2011). For Cary Wolfe, the animal is a social construction that when examined reveals the shifting nature of the categories of "animal" and "human" (Wolfe 2009; Shapiro and DeMello 2010).

While the miscegenation of the human and the animal has long held sway over the human imagination, resulting in both terror and curiosity, the species barrier, despite long practiced bestiality, is a firm biological one. That has not stopped both scientists and writers from imagining that the merging of the biological identities would result in improvements for both species. Let us now investigate examples in fiction of what happens when the boundary between human and animal breaks down.

### 3. FRANKENSTEIN AND THE ISLAND OF DOCTOR MOREAU

Regarded as the first science fiction novel *Frankenstein* has become synonymous with science out of control. Dr. Victor Frankenstein's hubris in creating life artificially heralded the trope of the mad scientist. As Susan Squier observes: "Mary Shelley's monster is an interspecies hybrid [...] he functions as a point of origin for the negative literary image of xenogenic desire" (Squier 1998, 366). Dr. Frankenstein made a man from the corpses of *both* animal and human: "The dissecting room and the slaughter-house furnished many of my materials" (Shelley 1818, 55) and the creature that emerged from the industrial revolution as the first manufactured human-animal hybrid also gave rise to a trope that has endured in science fiction.

Victor Frankenstein is fearful and appalled at what he has created. He is in sheer terror after bringing to life his creature after two years of toil. He runs to his friend Clerval, who asks what is wrong when he sees a wildness in Victor's eyes that frightens and astonishes him:

"Do not ask me", cried I, putting my hands before my eyes, for I thought I saw the dreaded spectre glide into the room; "he can tell. – Oh, save me! Save me!" I imagined that the monster seized me; I struggled furiously and fell down in a fit. (Shelley 1818, 62)

We see a shift in the mad scientist trope that occurs after *Frankenstein* to *The Island of Doctor Moreau*. After the publication of Darwin's *Origin of Species* in 1859, his evolutionary theory removed the boundaries between species, but it also placed the human at the top of the evolutionary ladder, and it is only humanity, for Darwin, which can assess the "grandeur in this view of life" (Fudge 2009). With man at the top of the tree, the trope of the mad scientist takes on a messianic tone. Like *Frankenstein*, Wells' novel is concerned with the role of science in the construction of a new race. Both the scientists Dr. Frankenstein and Dr. Moreau see themselves as gods and the creators of a new class of being. The difference is that post Darwin, Dr. Moreau is proud of his hybrid progeny and his role as creator of a new species.

*The Island of Doctor Moreau* was published shortly after Wells' hugely successful novel *The Time Machine*, and written in a highly productive period in which Wells did not expect to live long because of ill health. The works from this time, like *Moreau*, are dark and frightening, bating readers to imagine a world where the veneer of civilization was taken away because of a catastrophe (Lodge 2012). The novel is relevant to any discussion of scientific chimeras because it speculates on the consequences of scientific research (Danta 2012).

In Wells' novel, the "animalized victims" and "animal-men" who inhabit Moreau's island have been created by the reclusive scientist who has been forced out from his career in London where he practiced vivisection, the experimentation on live animals in order to understand the mechanisms of the liver, pancreas, spleen, and other organs.

What I find interesting is not *how* Moreau's chimeras are created, but *why*. As Margaret Atwood explains in her introduction to the 2005 edition of the *The Island of Doctor Moreau*, "no man ever did or ever will turn animals into human beings by cutting them up and sewing them together again" (Wells 1896, XIV). In Wells' preoccupation with the exploration of the boundary between the animal and the human, the chimeras are the results. Dr. Moreau's reasoning is that he wishes to drive out the evil in the human and turn the hybrid into a more rational creature than man. The fact that these experiments and surgeries cause horrific pain is of no concern to him. On Moreau's island, shipwreck survivor Prendick listens to Dr. Moreau's explanations for his experimentations; "[...] he was simple and convincing. Now and then there was a touch of sarcasm in his voice" (Wells 1896, 70). Indeed, Moreau sees himself as a father figure, ruling with a loving but iron fist to create the hybrid species who must obey strict rules; "[...] not to go on all-Fours; not to suck up Drink; not to eat Flesh or Fish; not to claw Bark or Trees; not to chase other Men" (Wells 1896, 59). While Prendick observes the chimera's use of language as a sign of their humanity, Dr. Moreau mocks and abuses the law the Beast Men chant, revealing how Well's portrays capacity for language as deeply ambiguous (McHugh 2006).

Prendick is preoccupied with understanding what distinguishes human life from animal life. It is a concern for the Beast Men as well. They have their rules – not to eat meat, walk on four legs, and so on, but adhering to the bible as laid down by Moreau does not make them men. They look uncannily human, so much so that Prendick is scared they are human turned to animals and is fearful that this will also be his fate.

When Moreau is killed and the Beast Men gradually devolve back to animal, Prendick is left without any possibility of companionship. He observes that their speech gradually disappears, becoming more simian; they walk erect with increasing clumsiness; they are unable to use their hands as humans do and eat like animals; they have no regard for decency or sexual prudishness, and make themselves lairs; "[...] and at night the air was hideous with their calls and howling" (Wells 1896, 126). In short, the Beast Men have awareness and then lose their self-awareness. The concept of the body as a mechanism, separable from the (human) mind allowed Descartes and his followers in the 17<sup>th</sup> century to justify inflicting pain on



animals when humans needed to use them in particular ways (Birke and Michael 1998). It is this notion that animal bodies are mere machines that underpins the use of animal bodies as repositories of supply parts – for xenotransplantation, and for the modification of animals for transgenic organs. The animal is sacrificed to provide life to special humans.

#### 4. A DOG'S HEART AND PIG HEART BOY

In the period between 1900 and 1929, eugenics as a popular social movement was reflected in science fiction. Science fiction films of this period integrated eugenics visually by exploring humanity's connection to its bestial past and exploited fears of tampering with human heredity (Kirby 2007).

While xenotransplantation was first recorded in 1682 when part of a dog's skull was used to repair the broken skull of a Russian nobleman, in Mikhail Bulgakov's long banned 1932 novel *A Dog's Heart* it is Bulgakov's use of contemporary scientific ideas that is used as both allegorical plot device and the basis for the creation of a human-animal chimera that interest us.

In Bulgakov's novel, the trope of the mad scientist is revealed in the character of a famous doctor, Professor Preobrazhensky; a name that means "transfiguration" (Fudge 2009). He takes a stray dog into his home and experiments on him by transplanting human testicles and a human pituitary gland into the dog. Like in the case of Dr. Moreau, his arrogance is on display:

A new area of science is opening up: a homunculus has been created without any Faustian report. The surgeon's scalpel has brought into being a new unit of humanity! Prof. Preobrazhensky, you are a creator! (Bulgakov 1932, 64-5)

Yet his hubris is quickly undone, as he watches, astonished and appalled, as Sharik the dog becomes a foul-mouthed, lecherous human who names himself Poligraph Poligraphovich Sharikov. As a chimera who has acquired language, Sharikov can speak for the animals subjected to scientific experiments who have no voice, and demands to know why he was operated on without giving his consent. What is at stake here is the dog's own species identity, something that human arrogance cannot fathom is important. The character of Sharikov operates as a narrative device raising questions of identity. Yet while Bulgakov provides readers with shifting species boundaries that are echoed by the shifting narrative voices (Fudge 2009), Sharikov is portrayed as having instincts that, like Moreau's Beast Men, cannot be



erased. He chases cats, and this is his undoing when it results in the flat being almost destroyed. The Professor again takes command, and reverses the experiment and turns Sharikov back into Sharik the dog.

Although readings of *A Dog's Heart* point to it as a political allegory and criticism of the Soviet System (Bulgakov 1932, XIV), it can also be argued that it has something to say about how constructed the notion of human really is (Fudge 2009). Bulgakov had ample scientific knowledge to draw on, having studied medicine at Kiev University in 1909 and worked in front line hospitals in World War I. He would have also been aware of the experiments by Russian scientist Serge Voronoff (1866-1951), working in Paris. Voronoff was one of the first to transplant testicular tissue from a monkey into a human reproductive gland in 1920. Five years later he had already performed this procedure on 300 patients and attracted patients from all over the world (Schultheiss, Denil, and Udo 1997). Voronoff argued that the grafting of slices of monkey testicle onto the testicles of men would lead to rejuvenation of flagging virility. Animal sexuality is seen as forceful, driven by primal instinct and unhindered by human anxieties. Erotic fiction of a bestial nature plays upon this insatiable lust and virility, so it is perhaps no surprise that after Voronoff began by experimenting with ageing rams in 1917, he made a fortune creating temporary "chimeras" of human males until their immune systems rejected the grafts.

Today, pig heart valves are routinely transplanted into heart patients with far greater success. However, while moral concerns over xenotransplantation relate to both animals and humans, on the Australian Government website *Biology Online*, the risks of xenotransplantation relate to humans, not to the animals which would be sacrificed to provide the organs and tissue.

In *Pig Heart Boy* a children's novel by Malorie Blackman (1997) that was shortlisted for the Carnegie Medal, thirteen-year-old Cameron Kelsey is dying of heart disease, and time is running out to get a transplant. In desperation, his father approaches transgenic doctor Richard Bryce, who is trying to conduct research with pig hearts. Dr. Bryce agrees to perform the operation on Cameron, although it has never been done before. Here we see an evolution of the literary trope of the mad scientist; the scientist is now seen as a lifesaver, science is seen as the last resort. It is the father who seeks the xenotransplantation for his son, not the "mad scientist" looking for a subject. In the late 20<sup>th</sup> century, as the human genome was being mapped, the fear of what might happen with gene splicing and biotechnology had not yet grasped the popular imagination. This was also a period in history when organ donation and IVF had become commercially viable and commonplace. Author Maureen Duffy argues that we now feel

“at the mercy of doctors, drug companies, physicians and biologists, who can manipulate the very genes in a fetus that could grow into a sentient creature that might one day be us” (Duffy 1995).

In *Pig Heart Boy*, Cameron’s mother’s fears her son will be less than human as a result of having such an important organ – the pump that runs the body, in effect – replaced by an animal’s heart. The heart is also symbolically linked to humanity, feelings of love, and the soul. To replace this heart with a pig’s – an animal equated in many cultures with uncleanness, greed, and cannibalism, is for Cameron’s mother unthinkable.

Xenotransplantation challenges the species boundary. How many animal organs can be inserted into a human before it is no longer considered wholly “human?”. One suggestion is to grade chimeras on a sliding scale of humanness, with pure humans at one end and pure animals at the other and various chimeras in between. Those who most exemplify humanness would be granted personhood – those only more than animal but less than human would not (Bennett 2006). I would argue that it is not only appearance that humans use for acceptance into their species. As we can see from *The Island of Doctor Moreau*, and *A Dog’s Heart*, language and compliance with social mores are also seen as key criteria for being human. What constitutes or defines what is human is generally not written down in law or legislation. Definitions are rooted in historical, cultural and ethical understanding of what it means to be human (Hinterberger 2011).

## 5. ORANGO

In the late 1920s Ilya Ivanov, an eminent Russian biologist at the Institute of Experimental Pathology and Therapy in the former Soviet Union, carried out experiments with doctors inseminating female primates with their own sperm. Ivanov was sent by the Soviet government and Academy of Sciences to Africa in 1926 to carry out experiments involving the artificial insemination of female chimpanzees with human sperm. Upon his return to the Soviet Union in 1927, Ivanov continued this controversial research at a primate station in Sukhumi. It is claimed these experiments, which bore no hybrid fruit, were part of a Stalinist experiment to breed a human-ape hybrid (Rossiianov 2002). These attempts to create a human-animal hybrid through artificial insemination inspired Dmitri Shostakovich’s recently resurrected 1932 satiric opera, *Orango*.

Planned as an opera in three acts with the forty-minute prologue, Shostakovich’s opera *Orango* was completed only in piano vocal score and languished in a Russian museum archive until 2004, when it was rediscov-

ered. The prologue was orchestrated by British composer Gerard McBurney and given its world première (semi-staged by Peter Sellars) by Esa-Pekka Salonen and the Los Angeles Philharmonic in December, 2011 (Lost Opera 2012).

The libretto, by writers Alexei Tolstoy and Alexander Starchakov, sets up the tale of the rise and fall of *Orango*, a.k.a. *Jean Or*, a human-ape hybrid who becomes an anti-communist and newspaper baron, swindler and blackmailer. Finally, his corrupted humanity causes him to revert like Moreau's Beast Men, to his animal state, becoming more like his ape mother in his features the older he gets. The monsters that captured the medieval imagination by the late 12<sup>th</sup> century were seen as the exact antithesis of humans; they were covered with hair, they lived away from the civilization of settlements, lacked speech and ate raw meat. This creature – a negative human – would have been a comfort because it challenged definitions of humanity with its previously intractable ideas about rationality, conformity to social norms and appearance (Salisbury 2011). The refusal to take these borders as unchangeable allowed Marxist biologists in the Soviet Union to support the experiments of hybridization between human and animal (Rossiiianov 2002).

The loathsome and animal nature of Jean Or is epitomized when he is put in a cage and displayed as a cautionary tale (Loiko and Reed 2011). Human Zoos that featured at world's fairs shaped international relations for over a century (1851-1958), a time when scientific racism enabled people to view The Other as a spectator sport and in which racism, segregation and eugenist ideas were able to penetrate public opinion (Boëtsch and Snoep 2011). Here, Jean Or, as the animal other, is cast perfectly as the spectacle in a cage: as his animal side emerges he is deemed savage and inferior.

In this libretto, we have all the hallmarks of the classic chimera-monster tale – the mad scientist is a French biologist who impregnates a female ape with human sperm. The scientist later invites the chimera into his home and introduces him to his daughter, with disastrous results when the chimera tries to rape the daughter. I argue this monstrous act is seen as fitting retribution for the act of trying to create a monster, which is how the chimera is regarded.

## 6. SPLICE

The movie *Splice* (2009) is speculative vision of what would happen if research such as the UK government backed research in cytoplasmic hybrids went beyond the regulated three-day growth and experimentation.

In Vincenzo Natali's transgenic science fiction horror film *Dren* – the ultimate chimera – is created by splicing animal and human DNA.

In the *Iliad*, Homer introduces the “furious chimaera” (Homer and Lattimore 2001, 360) with the head of a lion, the body of a goat and the tail of a serpent. Its form was symbolic of its monstrous nature. Along with the hybrids such as the Minotaur, the Gorgons, and the Sirens, the Chimera was seen as a sign of impending disaster. In modern biotechnology, the term chimera describes an organism comprised of at least two genetically distinct populations of cells originating from independent embryos. Chimera technology has rapidly left the realm of the hypothetical and this technology opens up a Pandora's Box of legal and ethical questions by intimately mixing human and animal.

In *Splice*, genetic scientists Clive Nicoli (Adrien Brody) and Elsa Kast (Sarah Polley) covertly conduct their own experiment to create a human-animal hybrid within NERD – a pharmaceutical company that funds their research – when they are told that other “splice” projects they are working on are to be shelved for more pedestrian research. In a last ditch effort to prove they can create a new life form, the scientists blend multiple animal DNA with human DNA. Elsa secretly uses her own egg, even though she does not want to have her own child and compromise her body, her life and her career. Here I would argue, we have two boundary transgressions, that of scientists creating life without a mother (Mellor 1998) and of the woman refusing conventional motherhood.

The blurring of boundaries through biotechnology results in the human-animal chimera *Dren*, who is born resembling a writhing, hissing lump with a long tail. *Dren* rapidly develops into a grotesque creature that looks like a plucked chicken with long emu legs, a kangaroo tail and a porpoise like head with side set eyes. Her fast growth transforms her into a girl who has a normal torso and arms, an increasingly normal looking head, and animal legs and hooves.

It is curiosity and hubris that drives Elsa and Clive to artificially fertilise a human egg with multiple animal DNA, although it is only after *Dren* is born that the scientists pause to consider the implications of what they have done. They subject *Dren* to X-rays and MRI scans to investigate her internal structure. They marvel at how the human and animal are fused. Clive wonders if her more deadly characteristics may turn out to be human or animal. Yet it is Clive who tries to kill the newborn because it is so grotesque and he reasons it must be in pain. Elsa is constantly driven by the desire to see what eventuates from the experiment. *Dren*'s life is one of isolation, agony and surveillance, culminating in her scientist parents plotting to kill her when she becomes a rebellious teenager and deemed out of

control. Yet, Dren defies the scientists and becomes the killer instead, displaying revenge and autonomy. Changing gender at the end of the movie, Dren kills her father and rapes her mother, impregnating her with a new lifeform, a naturally occurring human-animal hybrid. Dren's creation has disrupted the accepted human cultural boundaries, resulting in transgressive sexual activity with her parents that forces viewers to confront taboos such as bestiality and incest. Elsa's pregnancy is monstrous as a result, serving a warning of what is to come.

## 7. CONCLUSION

Through analyzing the breakdown of the boundary between human and animal made possible by scientific experimentation, I have shown how this has given rise to what Haraway argues in *A Cyborg Manifesto* is one of the criteria necessary for the emergence of the cyborg. In this paper, I have analysed the manufactured human-animal chimera as a cyborg created by scientific experimentation. As scientists use technology such as xenotransplantation, artificial insemination, IVF and biotechnology to merge the animal and the human, the creatures that result are Haraway's cyborgs. Created by science, these hybrids blur the species boundary, which has been transgressed by science before.

I have shown how we can use the character of the chimera in science fiction can be used to speculate on long held assumptions of the difference between human and non human species. In this contested space, much is at stake as the dominant species is able to control resources, power and autonomy. The servitude to which the submissive species – the animal – is relegated is revealed in the way the chimera is treated as property and in the way it is refused rights. When the chimera devolves back from human to animal, in *The Island of Doctor Moreau*, *A Dog's Heart* and *Orango*, the "natural order" is restored and species categories remain consistent.

Animal sacrifice is often the unseen and certainly unacknowledged aspect of animal experimentation to create the chimera. In *Pig Heart Boy*, both the animal donor and then Cameron, the young recipient, die and so the chimera does not have to live within "normal" society, polluting the species and disrupting the species boundaries. This disrupted species boundary is again restored as Dren is killed by her mother in *Splice*. The ending of the film remains ambiguous, with Elsa carrying a monstrous pregnancy to term.

As a literary trope, the mad scientist embodies the sense of human superiority and power. The mad scientist plunders natural resources – the

animal – for the prized qualities of strength, agility, instinct and heightened senses. I argue that this trope simultaneously epitomizes the way that humans have ravaged the planet, taking from the environment without thought of consequences.

In 21<sup>st</sup> century incarnations of the mad scientist trope, I argue that it is not the scientist that society fears, but omnipresent government, commercial or military interests that take up the biotechnology to use it against humanity. The final scene in *Splice*, in which the scientist Elsa considers her lucrative future with the NERD corporation as she continues an interspecies pregnancy, is a metaphor for research ideals selling out to financial pressures. As a symbol of the future anguish caused by commercial greed, *Splice*, a precursor to the late 2009 Global Financial Crisis, is terribly prescient. Kimberley Jackson argues that here we see the corporation as another manifestation of the monstrous. “Unlike Frankenstein’s monster, Dren will not be destroyed but will instead be reproduced and inserted into human bodies. The existence of corporate individuality, embodied by Dren, does not bode well for the future of humanity in general” (Jackson 2012, 133). Biotechnology is now advanced to the point where ethical concerns about the personhood of human animal chimeras are being seriously debated. In such a climate, the case studies examined have a relevance to 21<sup>st</sup> century science culture that goes beyond science fiction. These works can be read as more finely nuanced critiques in which those working within science are now being held accountable to ethical standards of research.

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