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Responsible Frankensteins?

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There are few novels that have been more interpreted and reimagined than *Frankenstein*, and it has become something of a cliché in bioethics—especially in debates about embryo research and reproductive technologies—to invoke Victor Frankenstein's hubris in "playing God" by creating a person out of inanimate matter. And yet, reading the story again two hundred years after its publication, we find that its moral teachings have been stubbornly ignored, or even inverted, by the scientists and ethicists who have the most to learn from it.

As a starting point for thinking about the counterintuitive place of the novel in contemporary discourse about technology and ethics, consider a 2012 essay by the French sociologist of science Bruno Latour, "Love Your Monsters," in which he argues that the real lesson of the novel is that "we must care for our technologies as we do our children." According to Latour, "Dr. Frankenstein's crime was not that he invented a creature through some combination of hubris and high technology, but rather that he *abandoned the creature to itself*," referring to the moment in the story when Frankenstein runs in horror, without good reason, from the creature he has made.

What would it have looked like for Frankenstein to exercise responsibility for his creation? Latour thinks that Frankenstein should have acted like a parent to his creation. But he goes further: "The real goal must be to have the same type of patience and commitment to our creations as God the Creator, Himself." This may be a bit of rhetorical exaggeration on Latour's part, but it is also a provocative variation on the idea that scientists are playing God when they go too far, especially in exercising control over the life and death of human beings.

The idea of playing God appears to have been on Mary Shelley's mind when she wrote the novel. In her preface to the later 1831 edition, she writes of her horrifying vision that would form the germ of the story:

> …I saw the pale student of unhallowed arts kneeling beside the thing he had put together. I saw the hideous phantasm of a man stretched out, and then, on the working of some powerful engine, show signs of life, and stir with an uneasy, half-vital motion. Frightful must it be;

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> for supremely frightful would be the effect of any human endeavour to mock the stupendous mechanism of the Creator of the world. His success would terrify the artist; he would rush away from his odious handywork, horror-stricken.

To today's bioethicists, "playing God" doesn't really mean anything. And horror—or repugnance—at the idea of manufacturing new life is just a feeling that gets in the way of acting responsibly, based on rational considerations of the moral principles and practical consequences of our actions. Most bioethicists would agree with Latour's notion that we should exercise a kind of parental responsibility in our use of technology, especially reproductive technologies, and that concerns about playing God, or about hubris, are meaningless. But Shelley shows us what playing God really means and what the moral problem with such hubris precisely is: It makes ordinary, parental responsibility impossible. Thus, in embryo research today, the "responsible" course of action toward new life is to destroy it.

Repugnance and Its Discontents

The idea that Frankenstein should have loved and cared for his creation does have a certain plausibility to it. From the creature's account of his early life, where we learn of how he was mistreated by humanity, and the eloquent indictment he makes of his creator for deserting and betraying him, it is easy for readers to blame Frankenstein for abandoning his creation, and to see that abandonment as the cause of the creature's evil. If Frankenstein had stayed and cared for his creature, on this reading, the horrible catastrophes that befall him and his family could have been averted. But as we will see, this oversimplifies Frankenstein's failure and ignores the novel's teaching both about hubris and repugnance.

Other ways have been proposed of how to think about the problem of the creature's evil that are similarly simplistic and miss Frankenstein's actual failure. One alternative is that the creature was intrinsically morally flawed, presumably because Frankenstein, being a mere man and not God, was incapable of manufacturing the goodness-instilling portions of the soul. In a 2013 book on the "fallacies" committed by opponents of human cloning, law professor Kerry Lynn Macintosh gestures at such an interpretation, writing that the creature Frankenstein makes is "physically grotesque, psychologically warped, and so morally flawed that it sees murder as the only effective tool with which to achieve its goals." Opponents of cloning, she continues, "argue that animals (or, potentially,

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humans) born through cloning are necessarily the flawed products of a technological process and can never be functional members of their species." Though this is a tendentious reading of *Frankenstein*, it could be fairly attributed to some of Shelley's epigones. In H. P. Lovecraft's short story "Herbert West—Reanimator," for instance, the eponymous scientist instills a semblance of life into recently deceased corpses, which become monsters bent on carnage and destruction.

The creature in Shelley's novel is not *inherently* flawed. He is no saint—he murders three people, including a child, and maliciously frames an innocent woman for that crime—but Macintosh's assertion that the creature sees murder as his only way of getting what he wants is obviously untrue. Early in the novel he makes clumsy but good-natured attempts to ingratiate himself with a French family he comes across in the woods. There is no excusing his crimes, but they are within the range of human evil: He is no bloodthirsty ghoul or demon but a person who lacked a moral upbringing and ties to family or community, and is filled with rage at wrongs both perceived and real.

Frankenstein's sense of repugnance early in the novel suggests that he, for his part, believed that the creature was inherently flawed; he, like everyone else, certainly saw the creature to be grotesque. It's striking that the mere appearance of the creature should have exercised such an influence on Frankenstein—even more so considering that the creature had appeared, and had indeed been made to be, beautiful in the months during which Frankenstein was assembling him. Perhaps the abrupt change of feeling can be attributed to the discrepancy between Frankenstein's "boundless grandeur" of his earlier dreams—a new species, power over life and death—and the physical presence of the actual, embodied person he had created. Or perhaps his sense of repugnance was an intuition that he had mocked "the stupendous mechanism of the Creator of the world," as Shelley intended.

If we want to understand Frankenstein's moral failure, we need to take seriously the place of repugnance. But there is more to his failure than this; we should not, like Latour, downplay the place of hubris. Frankenstein's failure is essentially two-fold, as we will see more clearly later. Building a human being for one's own greater glory is a sin, principally against the human being brought into the world not to be loved by parents but evaluated by manufacturers. Frankenstein compounds this sin, however, by conflating his sense of repugnance at his own action with a sense of repugnance at the creature himself. This misperception that the creature, rather than the act that created him, is intrinsically evil is what drives much of the story.

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Like playing God, repugnance is a much-derided concept in bioethics. Leon Kass's influential 1997 essay "The Wisdom of Repugnance" argued that there was deep wisdom in the sense of horror and anger that the idea of human cloning elicits for most people. On one reading, *Frankenstein* tells us that there is not wisdom but folly and cruelty in repugnance, since the horror and anger that Frankenstein and other people have for the creature seem not to be in response to the creature's evil but the cause of it. Kass, on the other hand, argued not that there would be wisdom in feeling repugnance at human clones themselves but rather at the act of making human beings through cloning.

But Frankenstein did not feel repugnance at the act of making his creature while making him; his repugnance manifested only when the creature was already before him. Why he was unable to recognize that anything was morally troubling *before* he finished the creature, and why his revulsion was directed at the mere appearance of his creation rather than the baseness of his own actions, may be gleaned by considering the source of Frankenstein's interest in science.

Narcissistic Science

The source of Frankenstein's interest in science and the ambitions that animated his creation of life were not in the then-modern natural philosophy, but in the "chimeras of boundless grandeur" found in the ancient works of magicians and alchemists. It is often remarked that *Frankenstein* was inspired to some extent by the science of the day, especially Luigi Galvani's experiments with re-animating dead body parts with electricity. There appears to be some truth to this claim—in that Shelley's idea to write about a scientist creating life may have been inspired by these experiments, as, most recently, Kathryn Harkup has argued in *Making the Monster: The Science Behind Mary Shelley's Frankenstein* (2018). But in the novel itself, the character of Frankenstein was not inspired by any so contemporary a scientist.

Of the many ways Shelley might have characterized the origins of the young Frankenstein's interest in natural philosophy—say, a fascination with living things like that recounted by E. O. Wilson, or the delight in finding out how things work described so well by Richard Feynman, or even the kind of hard-nosed atheistic determinism that would motivate the Frankenstein-like experiments of scientists like Jacques Loeb—she chose to ascribe it to nothing more than an idle day of reading a volume by the medieval alchemist Cornelius Agrippa. Isolated away from any

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formal scientific education, the young Frankenstein becomes something of a disciple of this and other medieval writers, with their recondite methods and fanciful promises of turning lead to gold and discovering the secret of eternal life. It is such sources of fabulous ancient wisdom that inspire Frankenstein, not the dull "realities of little worth," as he calls the work of modern science, that a more sober scientific education might have instructed him in.

We can see more about the contrast between the life of a modern scientist and Frankenstein's obsessive mania by examining the novel's brief account of his formal education at the University of Ingolstadt. Frankenstein's mentor at the university, Professor Waldman, is a charming natural philosopher who supports and inspires Frankenstein to pursue a career in science. But he indulges rather than rebukes Frankenstein's interest in the ancients, and seemingly has little involvement in Frankenstein's actual education or work. In the lecture Frankenstein attends, Waldman compares modern and ancient science, saying that "The ancient teachers…promised impossibilities, and performed nothing," but that modern scientists, "whose hands seem only made to dabble in dirt…have indeed performed miracles." The practice of modern science, for Waldman, is contemptuous in itself but capable of being put to work in the pursuit of miracles.

Later, in a conversation with Frankenstein, Waldman flatters his student's sensibilities by praising the thinkers Frankenstein read in his youth: "The labours of men of genius, however erroneously directed, scarcely ever fail in ultimately turning to the solid advantage of mankind." Waldman's saccharine remark takes on an ominous meaning when we consider the devastation wrought by the erroneously directed labors of the self-styled genius Victor Frankenstein.

For Waldman, science is a tool to be put in the service of imagination. It is a flattering and appealing picture for individual scientists, who can see their careers as ways to express and satisfy their deepest ambitions as "men of genius." By playing up the beneficence of works of individual geniuses, and downplaying critical scrutiny of grandiose schemes, Waldman's seemingly pleasant vision of science leads to just the kind of amoral mad science we see in Frankenstein's career.

Frankenstein notably achieves his success almost entirely in isolation from the actual scientific community—an individual, who thinks of himself as a genius and savior of mankind, toils away in isolation, not needing or heeding either the scientific or moral judgments of anyone else. He learns from them, at the university, but in the passive manner of

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an apprentice picking up skills and learning recondite secrets, rather than in the active manner of a colleague engaged in a common enterprise of research. Certainly, no one learned anything *from* Frankenstein about the secret of conferring life on inanimate tissue. It was a profoundly individualistic effort, an expression of an individual's genius and dedication rather than the collective effort of a scientific community.

From the lofty heights of genius to which Frankenstein elevated himself it can be impossible to see the moral demands that are near at hand. With the creation of a whole new species, or the salvation of mankind, or the casting of light into the darkness of ignorance seemingly within reach, Frankenstein sees the creature on which he is toiling not as a person whose happiness or misery will depend on him, but as mere dirt on which his hands are dabbling to perform miracles.

Making the Bride

Frankenstein's apparent inability to think about his creature as a person while making him, and about the moral responsibility this will involve, has consequences later in the story in addition to his abandonment of the creature. We can consider in particular the occasion when he is offered an opportunity to meet a very personal need of the being he created: the moment when the creature asks him to make a female companion to free him from his lonely existence. The creature sees his request to his maker for a female companion to be analogous to "Adam's supplication to his Creator"—a reference not directly to Genesis but to Milton's *Paradise Lost*—and it's easy to see the similarity of their situations. It is not good for the creature to be alone. And if Frankenstein has the godlike power to create, would it not be responsible for him to exercise it as God did for the benefit and happiness of his creation?

But Frankenstein very evidently does not recognize that it is not good for his creature to be alone. By abandoning his creature, he squandered, in spectacular fashion, the best opportunity he had to save his creation from loneliness. If Frankenstein is incapable of even the ordinary responsibility of parents not to abandon their children, he can hardly be expected to exercise the far greater responsibility of God in providing the conditions of happiness for a whole new species. If, as Latour proposes, Frankenstein had acted like a responsible parent after making his creature, there would be no need for him to exercise the godlike responsibility of designing a bride. In *Frankenstein*, unlike in Genesis or *Paradise Lost*, a whole human community exists, and there is no principled reason why a creature like

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the one Frankenstein made should not be able to join it. That the creature has in fact been rejected by all he comes across is Frankenstein's fault for failing to integrate him into the community, not for failing to make one additional similar companion creature.

Frankenstein relishes the opportunity to play God when his creature asks him to make him a bride: After admiring the "fine sensations" his handiwork proved capable of, he asks himself, "Did I not, as his maker, owe him all the portion of happiness that it was in my power to bestow?" Bestowing happiness through one's own power flatters the pride of one who considers himself a maker. But this kind of pride and moralistic grandiosity are fickle and contradictory principles for ethical guidance. Providing happiness for his creature through his own power might appeal to Frankenstein, but the concern that ultimately moves him—and that soon leads him to tear apart the bride he had begun to make—is that

"I trembled, and my heart failed within me; when, on looking up, I saw, by the light of the moon, the dæmon at the casement. A ghastly grin wrinkled his lips as he gazed on me, where I sat fulfilling the task which he had allotted to me.…As I looked on him, his countenance expressed the utmost extent of malice and treachery. I thought with a sensation of madness on my promise of creating another like him, and, trembling with passion, tore to pieces the thing on which I was engaged. The wretch saw me destroy the creature on whose future existence he depended for happiness, and, with a howl of devilish despair and revenge, withdrew."

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"one of the first results of those sympathies for which the daemon thirsted would be children, and a race of devils would be propagated upon the earth, who might make the very existence of the species of man a condition precarious and full of terror." Frankenstein's sense of responsibility shifts away from the creature he brought into being, and the happiness he may owe him, and toward a much grander object: "the very existence of the species of man."

Rather than being moved by concerns with the happiness of the person before him, Frankenstein seeks a greater significance for his actions, and worries that by doing something to secure the happiness of his creature he will abet in the propagation of a "race of devils" that will threaten the existence of the entire human species. It is this line of reasoning—and not, for instance, his other thought that the creature's bride might be equally miserable and unlikely to satisfy the creature's need for companionship—that Frankenstein finally finds decisive. Even if he was right not to make a companion for his creature (two wrongs don't make a right), his reasons were not; they were again motivated by the kinds of grandiose thoughts that from the beginning had been blinding him to the responsibilities he owed his creature.

"Responsibility" in Reproductive Technology Today

If exercising responsibility was so difficult for Frankenstein, what does that say about Latour's idea that the lesson from the novel for modern technology is merely that we must do it responsibly, loving it the way a parent (or God) would? Curiously, in advocating for parent-like responsibility for technology, Latour does not mention the most parental of modern technologies, those that are used to create children in the laboratory. These are the technologies that most closely resemble the actions of Frankenstein, in that they create not just objects that may be dangerous or beneficial, but *persons* who may be cared for well or badly.

Two of the chief problems in Frankenstein's sense of responsibility—that he sees grand abstractions like the future of the species as more important than the good of concrete persons, and that he sees responsibility in terms of maximizing control rather than providing care—can be clearly seen in ethical debates over contemporary reproductive technologies.

Consider, for instance, how the new technology of "mitochondrial replacement" is being implemented by scientists and regulators. These new techniques, which are now being used to create children with genetic material from three parents, are meant to prevent the transmission

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of diseases caused by mutations in mitochondrial DNA—the handful of genes that are not found together with the rest of the genome in the twenty-three pairs of chromosomes, but rather in cellular organelles that contain their own tiny genomes. Everyone's mitochondrial DNA comes exclusively from the mitochondria present in the egg cell, and so is inherited only from the mother. Women who carry mutations in a large proportion of their mitochondrial DNA can be at risk of passing on a variety of diseases to their children. The term "mitochondrial replacement" has become attached to a number of techniques that replace the chromosomes of one woman's egg cell with chromosomes taken from another woman's egg cell. Such chromosome-swapping allows a woman whose eggs carry a large number of mitochondrial mutations to move her chromosomes into the egg of a woman who has healthy mitochondria, meaning that the resulting child will have mitochondrial DNA from one woman and chromosomes from another (along with chromosomes from the father). The term "mitochondrial replacement" is somewhat misleading in that it is not the mitochondria but the chromosomes that are moved around between egg cells. But the goal is to allow a woman to have a child with healthy mitochondrial DNA and her own chromosomal DNA.

Responsible ethicists express a great deal of concern over the way this technology would constitute a modification of the human "germline"—that is, create children with genetic modifications that could then be passed down to future generations. One chilling response to this supposed problem is that when mitochondrial replacement procedures result in the production of female embryos, those embryos should be destroyed to prevent modifications of mitochondrial DNA from being passed down through the generations, and only male embryos should be used for attempting pregnancies.

Aside from the inherent immorality of selecting which embryos live and die, this form of sex selection is not even defensible in conventional terms of clinical safety and efficacy: Although it is true that mitochondrial modifications cannot be transmitted by men on to their children, mitochondrial disease in fact affects boys more than girls, and mitochondrial replacement is not wholly reliable at preventing it. The decision to allow only boys to be born thus actually makes the risk of mitochondrial disease *worse* on average among the population of children who are allowed to be born.

As with Frankenstein's decision to destroy his creature's female companion, the decision to destroy the female embryos created using mitochondrial replacement is motivated by the desire to control whole populations, rather than to provide the best care for particular human beings. It

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is rooted in a sense of responsibility, but not responsibility to the particular person the scientists seek to create but to abstract notions of what is best for the entire human species. The girls whose lives are brought into being are snuffed out lest they be a "curse upon everlasting generations."

Moral claims of this kind pervert responsibility by changing its subject from concrete human beings to grand abstractions like "the human species" or "the human germline." As Paul Ramsey wrote in *Fabricated Man: The Ethics of Genetic Control* (1970)—a book on the implications of the emerging technologies of artificial insemination and in vitro fertilization—the desire to exercise control over human genetics can transfer medical responsibility for the patients in front of doctors to "that celebrated non-patient, the human species." Advocates of genetic engineering have long argued that we have an obligation to use radical technologies to eliminate genetic disease for future generations. Some, like the geneticist Hermann Joseph Muller, even argued that without "fundamental educational reforms" to encourage voluntary eugenics as a kind of social virtue, we may be doomed to extinction by the deleterious mutations that are bound to accumulate across generations.

While proposals from genetic engineering advocates seem radical and untenable, the "responsible" approach to human embryo research may be even worse. For decades, the consensus among ethicists and scientists creating and experimenting on human embryos has been that it is broadly acceptable to make and tinker with human embryos, so long as those embryos are conscientiously destroyed rather than being allowed to be born.

Disagreement over whether destroying embryos is a legitimate way to exercise responsibility is what has always stopped the United States from banning human cloning. Scientists want to be able to clone human embryos, prohibiting doctors from allowing cloned embryos to be born. Others see this kind of "compromise" as the worst possible outcome: a legal requirement to kill some of the most vulnerable human beings.

Today's embryo scientists usually don't have Frankenstein-like ambitions to transform the world or create brand new species. They just want to carry out in peace their incremental research on puzzles of developmental biology or genetics, and they fear that the possible consequences of their work—babies born with horrible deformities—would lead to outrage and interference from the public. And so, with a crass interest in protecting themselves from unwelcome public attention joining their lofty obligations to protect the human species from the prospect of radical changes to the human genome, they take the necessary steps to control and limit those consequences.

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Such "responsible" scientists have clearly learned the wrong lesson from *Frankenstein*: They see the dramatic consequences of the monster running beyond his creator's control, and so they seek to tighten the control they exercise over their own creations. In one recent essay on the novel's lessons for today's engineers and scientists, political science professor David Guston compares Victor Frankenstein unfavorably to Rabbi Loew, who, according to legend, created a golem, an artificial man, by the manipulation of certain Hebrew letters. The golem could also be destroyed by erasing certain letters. Guston writes that, "while the Rabbi shares Victor's culpability as a bad father, he at least retains control over a kill switch—something that Victor never had or even contemplated." A kill switch is a perfectly reasonable technology to implement for an engine that might otherwise run out of control, or even for genetically modified organisms that could be released into the environment. But it is certainly not the kind of tool whose use could lessen one's "culpability as a bad father."

Frankenstein's sin was not that in abandoning his creature he failed to control it. It was that in abandoning his creature he failed to love and provide for it. It is the pain that follows from this abandonment that warps the creature's morality and leads him to the disasters that follow. Scientists today avoid the fate that befell Frankenstein merely by abandoning their creations even more conscientiously than he did.

The Creature as Person

Modern embryo researchers—and even many of their critics—find themselves in a disturbingly similar position to Frankenstein. For researchers, "responsibility" does not mean providing the best care for the vulnerable human beings they create but rather maintaining control over the consequences of their own actions. If a child were born with a deformity caused by genetic engineering or some other experiment, there would be outrage. Such children may themselves even seek redress from their negligent creators, though likely less violently than the creature did with Frankenstein. But instead, the publicly recognizable consequences of creating human beings in the laboratory are controlled by scrupulously abandoning and destroying any such inconvenient creations.

Responsibility begins with treating the human beings we create as persons—providing the best care possible for them and taking seriously their broader interests. Because of the grave, often unknowable risks involved in experimental reproductive technologies like cloning or

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making three-parent babies using mitochondrial replacement, taking the interests of the would-be babies seriously may often mean that we should simply forgo using these technologies. Or it could mean that measures must be in place to absolutely ensure the best possible treatment for such children, from the very earliest stage.

But the reigning approach to the responsible regulation of reproductive technology is a perverse compromise that demands the killing of vulnerable human beings lest their appearance before the world inconvenience

"On examining my dwelling, I found that one of the windows of the cottage had formerly occupied a part of it, but the panes had been filled up with wood. In one of these was a small and almost imperceptible chink, through which the eye could just penetrate. Through this crevice, a small room was visible, whitewashed and clean, but very bare of furniture. In one corner, near a small fire, sat an old man… who, taking up an instrument, began to play, and to produce sounds, sweeter than the voice of the thrush or the nightingale. It was a lovely sight, even to me, poor wretch! who had never beheld aught beautiful before.… He played a sweet mournful air, which I perceived drew tears from the eyes of his amiable companion, of which the old man took no notice, until she sobbed audibly.… He raised her, and smiled with such kindness and affection, that I felt sensations of a peculiar and overpowering nature: they were a mixture of pain and pleasure, such as I had never before experienced, either from hunger or cold, warmth or food; and I withdrew from the window, unable to bear these emotions."

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parents, doctors, and the scientific community. Unlike Frankenstein, the diligence with which we abandon and destroy our creations ensures that we will never be inconvenienced by them, and certainly will never face their vengeance. But the horror of the novel is not in the threat of violence from the creature, but in the boundless depravity of the man repulsed by the misery of the person he created in his own image.

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