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Power without Responsibility? Creating Life in the Laboratory

And God created man in His image.

Genesis 1: 27

I collected the instruments of life around me that I might infuse a spark of being into the lifeless thing that lay at my feet. . . . [M]y candle was nearly burned out when, by the glimmer of the half-extinguished light, I saw the dull yellow eye of the creature open: it breathed hard, and a convulsive motion agitated its limbs.

Mary Shelley, *Frankenstein*

One egg, one embryo, one adult—normality. But a bokanovskified egg will bud, will proliferate, will divide. From eight to ninety-six buds, and every bud will grow into a perfectly formed embryo, and every embryo into a full-sized adult. Making ninety-six human beings grow where only one grew before. Progress . . . [We can create] standardised men and women in uniform batches . . . Ninety-six identical twins working ninety-six identical machines. . . . The principles of mass production at last applied to biology.

Aldous Huxley, *Brave New World*

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To lay one's hands on human generation [as has been done with in vitro fertilization] is to take a major step toward making man himself simply another of the man-made things.

Leon Kass, 'Making Babies'

A society that allows cloning, whether it knows it or not, has tacitly assented to the conversion of procreation into manufacture and to the treatment of children as purely the projects of our will. Willy-nilly, it has acquiesced in the eugenic re-design of future generations. The humanitarian superhighway to a Brave New World lies open before this society.

Leon Kass, 'Why We Should Ban Human Cloning Now'

Fictional creatures

The name of Frankenstein, the eponymous hero of Mary Shelley's novel, is known to most people throughout the Western world, irrespective of whether they have read the book itself. Augmented by decades of cinematic adaptations, the legend of Victor Frankenstein and the monster he created by assembling parts of dead bodies has become one of the central icons of our collective imagination. Myths and legends about the tragic consequences of over-weening pride have a history dating back to the Greeks. Shelley pays homage to that heritage by giving her book the subtitle, 'The Modern Prometheus', alluding to the tale of the unfortunate fellow who stole fire from the gods and paid dearly for his offence. Fire, of course, is one of the basic requirements of civilization, so at least Prometheus was not punished for a trivial offence. Neither, of course, was Frankenstein.

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Shelley departed from all prior versions of tales chronicling the nasty consequences of hubris in one crucial respect: there is no supernatural dimension—no tricks played on the gods, no bargains with Mephistopheles. Victor Frankenstein uses science and science alone to create life—without sex, without women, and, most of all, without God. For him, the scientific enterprise is all-consuming; it takes him away from human interactions and leads him to loathsome charnel-houses and dissecting rooms in his search for body parts from corpses. His very name has come to symbolize the mad scientist of popular imagination, hidden away and up to no good. He embodies and evokes the sum of our fears about the biological sciences: fears about scientists with impermissible motives, who conduct immoral experiments, and reveal secrets best left undiscovered; fears also that the power of science will strip us of our autonomy and dignity and render us less than human. As soon as he has animated his creature with the spark of life, Frankenstein is filled with regret, horror, and disgust at the consequences of his scientific quest. He fails to take responsibility for his creation and that, among other things, makes him a truly unsympathetic character. In fact, it is the monster who elicits our sympathy, having become evil only because he is spurned by humans who recoil at his ugliness. His acts of revenge are the physical embodiment and retributive mechanism of the evils of forbidden knowledge. As such, he destroys Victor and everything and everyone Victor holds dear.

In his power, emotionality, and primal force, Frankenstein's nameless monster embodies the Romantic movement's rejection of eighteenth-century rationalism and its hope that science could lead mankind to human progress and

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ultimate perfection. Victor's activities in the laboratory clearly take him in the opposite direction, to destruction, ugliness, and then despair. Cynicism and suspicion about extravagant hopes for science persist. The fear of modern biology relates not only to its power, but also to its promise and its very focus.

The focus is within; it's all about us. The scientific enterprise has been accused of robbing life of its mystery by revealing too much, by explaining too much. Now that the genetic text of life is being read, there is great disquiet. How can we continue to view ourselves as special if we share so many genes with chimpanzees, with mice, and even with yeast? If the locus of who we are is not in the heart, where is it? As the workings of the brain are better understood, what cherished romantic explanations will be vitiated? We certainly want the fruits of scientific knowledge—cures for dreaded and currently incurable diseases. But many of us are far less keen to have our genetic fortunes told. Most of all, we do not want the awesome power of science to fall into the wrong hands. Even our own. IVF babies, cloned babies, and notions of designer babies all conjure up visions of our being in control of reproduction—of our being able to bypass life's lottery and even the genetic lottery—and that control is at best a mixed blessing.

When Mary Shelley wrote *Frankenstein* almost two hundred years ago mechanisms for the generation of life were not yet understood. Therefore, she had Frankenstein create his monster mechanistically—by assembly. The idea that a human or quasi-human body could be built out of artificial components had important philosophical roots in the eighteenth century, when La Metrie wrote of man as machine. There are, however, literary antecedents that are hundreds

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and even thousands of years old in myth and legends about automata—pseudo-humans and fellow creatures that can trick observers into believing they are really humans. One of the most famous examples is from Offenbach's opera, *Tales of Hoffmann* (based on stories by the German writer E. T. A. Hoffmann). Olympia is a life-sized doll, but she is so beautiful and she seems so real. Hoffmann is besotted; 'I know she loves me,' he cries, surely the ultimate in love-induced delusion.

There are many benign examples of manufactured creatures in fairy tales and other children's stories. Pinocchio, a toy, wants to be a real boy; the Velveteen Rabbit wants to be a real rabbit. In the film *AI* a robot specially made to be the much-loved replacement for a dead child literally goes to the ends of the earth to be loved and thus to be real.

Stories and films about manufactured life that are written for adults lack the benign and hopeful face of children's stories. Automata are the ancestors of the androids, cyborgs, and robots of modern literature and film. They can be produced in multifarious ways—by the gods (the Delphic oracles), by man using magic (Golem), or by man using science (Frankenstein's monster). For example, the golem, a figure from medieval Jewish literature and storytelling, is artificially created and then animated by magic so that he will look and act rather like a human. He can be helpful as a protector of Jewish villages or dangerous and hard to control.

Ideas about making people or people-like creatures entered the realm of mass production in Aldous Huxley's *Brave New World*, published in 1932. It takes place in AF 632, with 'F' referring to Henry Ford, whose Model T automobile was the first to be manufactured on an assembly line. God is dead

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or at least irrelevant. Under the banner of ‘community, identity, stability’, freedom, individuality, and authenticity are literally bred out of the lower castes of society through the twin mechanisms of ectogenesis (gestation outside the womb) and environmental conditioning (using chemicals, oxygen deprivation, and other means). The link between the mechanisms is the Bokanovsky process, cloning by embryo splitting, in a fantasy version capable of producing not the twins that occur in nature but ninety-six identical babies. The goal of the conditioning is creation of people with an inescapable social destiny—a destiny that they accept without question or complaint. In the Social Predestination Room babies with limited potential are decanted as ‘sewage workers of the future’. The lineage of recent cinematic and literary cloned armies or drones can be traced straight back to Huxley’s nightmare vision of mass production of nameless, faceless creatures with stunted human potential—produced to order for the purposes of the state.

Many people assume that the themes in *Brave New World* sprang full blown out of Huxley’s imagination, but that is not the case. The ideas were in the air during the 1920s and writers including J. B. S. Haldane, Bertrand Russell, Lord Birkenhead, and Huxley’s brother Julian all wrote about the themes and concerns that found their way into *Brave New World*. In these pre-double helix days, eugenics could only be achieved by selective breeding or sterilization of the unfit. The horrible fulfilment of such ideas about eugenics occurred in Nazi Germany.

Haldane leaned towards the optimistic view of the power of biological science to transform our lives. Russell was much more pessimistic: he feared that science could be misused to

enhance the power of some at the expense of others. Haldane and Lord Birkenhead both predicted that the separation of sexual love from reproduction would characterize the human reproduction of the future. And, as IVF becomes increasingly more prevalent, it is clear that they were partially correct. Ecotogenesis remains impossible—but for how long?

The work of ART in the age of mechanical reproduction

With a nod to philosopher Walter Benjamin for my adapting the title of his seminal treatise on aesthetics of some forty years before, in the early 1970s, the work of ART (assisted reproduction technology) in the age of mechanical reproduction elicited enormous anxiety. However, unlike the birth of Dolly the sheep, the birth of the first IVF baby, Louise Brown, did not come as a shocking surprise. Throughout the preceding decade, Robert Edwards and Patrick Steptoe, the principal scientists working in the field, issued regular updates about their research. As the public looked on in amazement, first animals and then humans were fertilized outside the body, in the proverbial test tube (actually a dish). Fictional dreams had become fact. Life could be created in the laboratory. One of the most private and meaningful events in human life had its privacy invaded and its meaning complicated, especially its moral meaning. What was this embryo growing in a dish? Was it a person? What could ethically be done to it?

Anxieties about the separation of sexual love from reproduction—evoked by and embodied in the mere mention of *Brave New World*—were soon joined by anxieties about repro-

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duction (more accurately, replication) even without eggs and sperm. Seven years before Louise Brown was born, James Watson, the co-discoverer of the structure of DNA, published an article in an American magazine, *Atlantic Monthly*, called ‘Moving Toward the Clonal Man: Is This What We Want?’ The work of Steptoe and Edwards had made human cloning imminent, said Watson (one of the few scientists whose name was recognizable to the broader public), and that was a very, very bad thing. This article marked the beginning of the first wave of cloning anxiety and clear parallels exist between the public attitudes then and those that greeted the birth of Dolly the sheep more than twenty years later.

Philosophers, theologians, doctors, and lawyers involved in the fledgling field of bioethics took the question of cloning to their collective bosom. Dr Will Gaylin, the co-founder of what is today called the Hastings Center, a bioethics think tank, wrote an article for the *New York Times* Sunday Magazine explicitly linking cloning with the theme of Frankenstein: ‘Frankenstein Myth Becomes Reality’. There was a flurry of scholarly papers exploring rather arcane arguments. The public was alarmed. Scientists stepped forward and Watson stepped back; the public was told that cloning wasn’t really that imminent after all. So bioethics moved on to other topics that were more pressing in the 1970s, those that focused on the end of life rather than the beginning: the nascent field of organ transplantation and the first right to die cases.

Assisted reproduction remained a subject of moral concern but the focus shifted slightly. Once the first babies were born, it was hard to remain upset about the technique of IVF itself. Photographs of adorable babies don’t quite mix with

scary headlines. Instead, moral concern and public curiosity tinged with alarm were centred on the myriad of possibilities that conception outside the body made possible—including the separation of genetic and gestational parenthood. Leon Kass, the chair of President Bush's bioethics council, wrote several articles arguing against IVF; it was, he believed, the first step on the slippery slope to a brave new world in which children would be manufactured commodities. While he has since changed his mind about the morality of IVF, Kass has made many of the same arguments about the moral perils of both human therapeutic and reproductive cloning with liberal use of the Brave New World analogy.

Does the world of assisted reproduction really bear any resemblance to Huxley's nightmare vision? Central to *Brave New World* is mechanized reproduction for the benefit of the state. Biological engineering and environmental conditioning combine to serve totalitarian ends. Babies are produced in artificial wombs and then 'decanted'. There are no parents, there is no love. Humanity, creativity, and freedom are destroyed. All traces of individual identity are ruthlessly eradicated in the service of efficiency and communal cohesion. And perhaps most chillingly of all, people are manufactured to fulfil a predetermined role. There is no freedom, no autonomy, no chance to build a life of one's own.

When the latest innovations in assisted reproduction are reported in the media, 'Brave New World' is often used as a shorthand expression to suggest that we might be going in a rather scary direction. But, clearly, modern infertility treatment is nothing like the factories described in Huxley's book. People who cannot reproduce naturally seek assistance in order to have children to love and care for. Despite the sepa-

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ration of the sexual act from reproduction, what is going on is essentially what has always gone on: parents begetting children.

With respect to cloning, however, 'Brave New World' functions as much more than a shorthand term for headline writers. The book's nightmare vision of powerless, mindless, mass-produced clonal zombies fits all too well with contemporary ideas of clones and cloning. In a time when beliefs of genetic determinism are in the ascendancy, a clone, with a genome chosen for him by someone else, may seem to be as hobbled, constricted, and dehumanized as the products of *Brave New World's* Predestination Room. In fact, as I hope this book will make clear, human clones would be nothing of the sort.



8. The nose