

Frankenstein lives on

It was 200 years ago that Mary Shelley's *Frankenstein; or, The Modern Prometheus* was published. Over the decades, this gothic tale has captured the popular imagination through the numerous theater productions and films it inspired. The story is commonly taken to imply a dire warning about the dangers of scientific hubris. Just mention the name Frankenstein and laypersons think of scientists "playing God."

In the common view, the inevitable consequence of Frankenstein's alleged transgression—bestowing life on inanimate matter—was that he created a monster that would wreak havoc on his family and friends. Frankenstein's name is repeatedly invoked in debates about emerging technologies like biotech, nanotech, synthetic biology, and artificial intelligence. However, the view of Shelley's story as a cautionary tale about scientific hubris, although dominant, is only one possible interpretation. Her novel, actually, is a multilayered story full of ambivalences and much subtler than most Hollywood versions. It naturally lends itself to diverse interpretations.

An alternative view holds that Frankenstein's moral transgression was not that he undertook the hubristic attempt to create a human being, but rather that he, once his work finally met with success, ran away from his creature and left him without any parental care. Left to fend for himself, the creature sought friendship and companionship from others, but again and again encountered rejection due to his hideous appearance. Only then did he become a monster intent on violently avenging the injustices done to him. On this view, then, Frankenstein's moral shortcoming was that he did not assume responsibility for his own creature and failed to give him the care he needed.

The American philosopher of technology Langdon Winner has used this interpretation as a clue for dealing more responsibly with new technologies in general. He holds that researchers must be willing to assume responsibility for the vicissitudes of their technological

creations, help them to acquire a suitable role in society, and provide adequate follow-up care if necessary. With so much emphasis nowadays on responsible innovation, this message finds wide resonance. Under the heading "Love your monsters," it is also supported by the French philosopher Bruno Latour. A group of social researchers from Arizona State University, led by David Guston, concurs: "The lack of care for new creations is what ultimately destroys us, not the creations themselves." This group considers the focus on hubris unhelpful in furthering responsible innovation. Rather, the emphasis should be on openness and responsiveness to public concerns, and on the anticipation and timely modulation of possible negative effects of new technologies.

Researchers, especially in the life sciences, are understandably anxious about being tainted with the "F-word." To the charge of playing God, they usually react by professing humility, but some take a more defiant attitude. James Watson once famously declared: "If scientists don't play God, who else is going to?" Craig Venter is on record as having said about his synthesis of a microbe with a minimal genome: "Shelley would have loved this!" Such

responses might be perceived as arrogant, but they are also a welcome challenge to a quasi-theological argument. Kevin Esvelt, coinventor of CRISPR-based gene drives, aligns with the proponents of responsible innovation in his pleas for openness and public engagement. For him, it is really hubris when researchers work in secret like Frankenstein and fail to seek advice from others.

The question remains whether indeed technological creations themselves can never bring us down, assuming due care is exercised. What about George Church's ambitious plan to resurrect Neandertal man? Would everything be okay if he just provided adequate fatherly care for a Neandertal baby born from a willing surrogate mother? Or would resurrection be not such a good idea after all?

—Henk van den Belt



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Mary Shelley

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