Eventually, Cédric journeys to Sicily and discovers where his body came from. He is in the land of *The Odyssey*, and symbols become more mythic and obvious the more he travels. He has a tattoo on "his" arm of a triskelion, a three-armed spiral that Lorna helpfully explains represents "three worlds, those of the spirits, the living, and the dead." In an utterly implausible chain of events, Cédric encounters Anantha, the lover of Alessandro, the man whose body Cédric now has. Anantha turns him into a kind of sex slave in the manner of Calypso, the nymph who imprisoned Odysseus as her lover. Avoiding looking at Cédric's head, Anantha at once mourns and is turned on by the body before her. And like Odysseus, Cédric is in exile—from his home, his body, his self. "From now on," Cédric thinks, "he was inevitably fated to be deprived of existence. Was he even alive?"

Desirable Body is a slight book that, in its shallowness, its pasteboard characters, and its inability to grapple with or demonstrate convincingly the questions it raises, disappoints. However, and fortunately for anyone interested in these themes, another French author, Maylis de Kerangel, has written *Mend the Living*, translated by Jessica Moore and published in English in 2016. This masterly novel re-creates the reality, not the fantasy, of a heart transplant. Rather than writing a farfetched tale that uses trite rhetorical questions to propel itself toward "meaning," de Kerangel instead did her research. In scrupulous detail and with unflinching empathy, she narrates the passage of a young surfer's heart from his body to its new home in a dying woman's chest. She finds poetry in the bureaucracy and technology of actual organ transplantation. If you want a profound meditation on the meaning and reality of organ transplantation, turn to *Mend the Living*.

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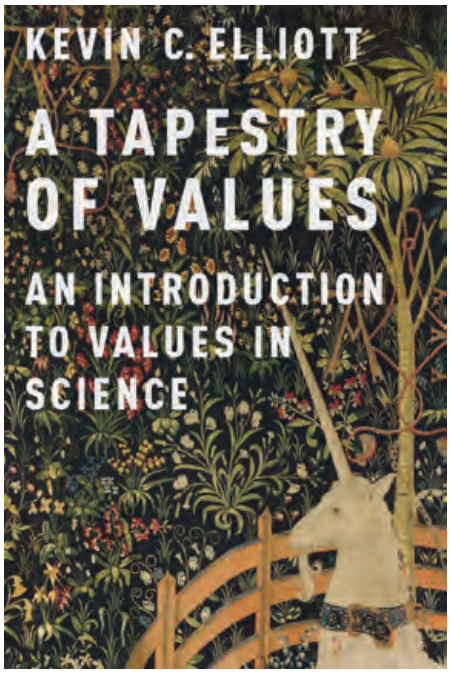
Science and Society

GRETEL FOLLINGSTAD



A Tapestry of Values: An Introduction to Values in Science
by Kevin C. Elliott. New York, NY: Oxford University Press, 2017, 208 pp.

The Chinese scientist He Jiankui's 2018 announcement of the birth of twin girls whom he had genetically modified to be resistant to HIV stunned both the scientific community and society at large. He had used a precision gene-editing tool called CRISPR, recognized as a powerful innovation in potentially treating genetic diseases; at the same time, the technique could also be used to enhance humans or alter the human genome. In a March 2019 comment in the journal *Nature*, many leading scientists involved in the gene-editing field called for a global moratorium on gene editing of human embryos. They aimed to send a clear message to the scientific community that genetically modifying embryos is not acceptable until safety and efficacy issues are resolved and a broad societal consensus about the appropriateness of the application is reached.

This is a powerful example of the role of values in scientific decision-making: despite citing technical concerns, researchers grounded their call for a moratorium in values such as equality, safety, and transparency. Values are an innate element of human decision-making. Although often unacknowledged, they factor into the questions scientists choose to research and the methods they use to investigate those questions. Values also influence the timing of communication, education, and dissemination of scientific knowledge to society.

Kevin C. Elliott's book *A Tapestry of Values* offers a nicely organized framework for understanding how values work in scientific practice and how values can be embraced to improve the quality of science and its utility to society. Through case studies in different areas of science, Elliott explains the role of values in science and their relevance to research. Elliott defines a value as "something that is desirable or worthy of pursuit," often characterized as ethical, political, or religious; he describes the interwoven nature of values in science as a "tapestry." The book explores appropriate ways to handle the relationship between science and society and presents five primary influences that values can have on scientific practice: the choice of research topics, the research methods employed, the research goals, the response to uncertainty, and the way the results are shared.

Elliott emphasizes two primary justifications for consciously bringing values into specific aspects of scientific practice. The first justification is that there are unavoidable instances that require scientists to make choices that will serve certain values over others. Acknowledging this allows for a transparent approach to thoughtfully and ethically taking on that responsibility. The second justification is the recognition that values can help scientists meet their goal of serving society.

Elliott conditions these justifications with three criteria for deciding which values should play a role in scientific

practice. The first criterion is engagement between scientists and other stakeholders, such as policy-makers and the public, which Elliott describes as occurring through bottom-up citizen groups or top-down formalized input. Each form of engagement allows various stakeholder values to be considered in scientific research.

The second criterion is transparency, which offers an avenue for scientists to explore unavoidable and embedded values in their choices or assumptions. Striving for transparency about the roles of values within a study can help reveal the benefit of values in the scientific process.

The third criterion is representativeness: the values that influence research should be representative of ethical and social priorities. Elliott admits that it's difficult to deduce truly representative values—although engagement helps—but he calls for an ethical commitment to do so. He notes that "what makes values legitimate is not that they are of a particular sort (e.g., conservative or liberal, religious or secular) but that they are incorporated in a transparent fashion, with adequate discussion about whether they meet our ethical and social priorities while doing justice to the empirical evidence."

Various scholars have contributed to clarifying the dynamics among science, society, and policy, offering perspectives and tools to narrow the gap between science and society. For example, the science and technology studies professor Sheila Jasanoff has explored this gap by explaining that an "expert" tends to structure problems so they are amenable to analysis, framing expertise as science and considering knowledge outside that frame as values or policy. Jasanoff argues that experts need to be exposed to greater norms of transparency to inform the discussion between experts and society.

Elliott's contribution reflects on these needs and provides a framework to understand how transparent values contribute to improving how science is practiced. But missing in the book is a link between this framework and the science and policy debate as it plays out in real life.

Perhaps one of the most influential arguments regarding the rightful place of science in society came from Vannevar Bush, the architect of post-World War II US science policy. In his report *Science: The Endless Frontier*, he explains that the "social contract" between science and society allows scientists alone to decide what research best serves society. The resulting isolation of science from society—placing the enterprise above the fray of grubby, value-laden politics—has contributed to its reputation as the most rigorous and reliable pathway to objective truths. But it also means that choices about what science is best for society are mainly based on scientists' perceptions of societal needs. When society hasn't been an explicit part of that decision-making process, trust and legitimacy are eroded.

The lack of a common language or common knowledge between the two arenas complicates the application of science to policy. Scientists and politicians may not understand the complexities of each other's respective disciplines or expertise. Scientists, unsure how their work may be construed in the public sphere, may be reluctant to share evidence with other stakeholders. A history of distrust and lack of respect for their respective roles has driven concerns about the potential misuse of scientific data to support a political agenda, or using a political agenda to drive scientific research priorities.

This brings into question how scientific contributions should be balanced against other policy concerns. For example, scientific evidence of climate change has helped to create a social and political debate about reducing greenhouse gas emissions—a debate that cannot be settled by the science. The issue is further complicated by scientific studies that focus on the uncertainties of climate models, creating additional questions about what constitutes "good" science for policy-makers. Competing facts and varying scientific predictions require values-based decisions to interpret. Values are deployed in decision-making and communication processes by all the different stakeholders: by scientists no less than by policy-makers and the public.

Values are often an unaccounted-for (or ignored) ingredient in the appeal for objective scientific processes. In fact, science is embedded within a "matrix" ("something within or from which something else originates, develops, or takes form," according to Webster's), which might be a better description than Elliott's "tapestry." As Elliott explains, the constructed landscape of so-called objective, value-free science is actually laden with preconceptions and biases, stemming from a scientist's knowledge-set or expertise, background, funding, time constraints, and the like. Science is embedded in a matrix of values that influence the decisions and choices involved in scientific practice, making the goal of value-free science impossible. The pursuit of this illusion of value-free science only exacerbates the gap between science and society, while creating a lack of accountability for the science. Elliott makes clear that science can't provide value-free answers to problems embedded within a value-laden matrix.

If one of the goals of science is to benefit society, shouldn't societal values matter? Elliott's book argues that "framing-in" values as an ethical element of scientific decision-making is more realistic than the ideal of value-free science, but it requires a commitment to transparency in scientific practice and engagement among science, society, and policy. *A Tapestry of Values* makes a very good case for the importance of incorporating and qualifying the values that are an unavoidable element of all scientific research.

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