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## *Book Review* Genetic Ethics: An Introduction

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*Genetic Ethics: An Introduction*

Colin Farrelly, Cambridge: Polity Press, 2018, 207 pp., \$24.95 (pbk)

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There are few technological innovations that have galvanized public ethical debates more than the application of genomics biotechnology in human medicine. Case in point is the public outcry that resulted from He Jiankui's use of CRISPR to alter the genomes of twin girls. While the alteration was intended to increase the children's resistance to HIV, medical professionals and bioethicists alike called the research highly problematic and ethically troubling (Normile 2018). This outcry was the result of clear violations of research standards, but also was due to how biotechnology was applied and the nature of the genetic changes themselves. As illustrated by this case, biomedical technologies have the promise of promoting social benefits, such as reproductive freedom, healthy aging, and the prevention and/or treatment of genetic diseases. Indeed, Farrelly argues that "an understanding of the role that genes play... could expand the domain of interventions (both environmental and genetic) to improve our opportunities for living flourishing lives" (p.2). However, these technologies could also be applied in ways that are ethically problematic, as we have learned from the history of eugenics, where advances in knowledge of genetics led to outrageous social injustices.

*In Genetic Ethics: An Introduction*, Collin Farrelly attempts to address a wide range of ethical and social issues that could arise due to the advancement of new biotechnologies, from genetic testing and screening to genetic therapy and genomic editing. Farrelly applies virtue ethics to important questions at the heart of these biotechnologies. These include but are not limited to the following: Should we apply genetic engineering technologies to humans? If so, how should we utilize these technologies? Is it ethical to screen embryos to determine sex or to increase the probability that the child will inherit a desired hair or eye color? Should we alter the human genome to potentially increase "desirable" attributes, such as increased intelligence, longevity, or disease resistance? And is genetic engineering a form of eugenics? According to the author, the book was written for scholars and students who are interested in grappling with these and other social and ethical implications of new biotechnologies. In particular, the book is broken into chapters that focus with a specific biotechnological application, such as eugenics, epigenetics, reproductive freedom, aging, and behavior. In this way, it is designed to enable readers interested in a specific area to pinpoint relevant sections.

In the introduction, Farrelly outlines his basic position and introduces his particular flavor of virtue ethics. In contrast to "rule" ethics, or those that identify specific principles (such as "thou shalt not lie") that should be followed at all times, virtue ethics focuses on the development of character. A virtuous person can identify the "mean" between extremes that is the right action in the context within which you are acting. For example, a virtuous actor may recognize that telling a "white lie" may be preferable to telling the truth in certain circumstances. However, in contrast to historical virtue ethics, Farrelly

clearly states in the introduction that his use of virtue ethics occurs largely at the societal level, rather than the individual level. Though, it should be noted that the author is a tad inconsistent here, as he discusses both individual and societal implications throughout the book. In addition, his application applies specific virtues, including benevolence and justice, to genetic technologies. The virtue of benevolence includes benefiting others *and* preventing avoidable harms at the individual and population level. In conjunction, justice primarily focuses on whether the benefits and burdens associated with the technological intervention are fairly distributed throughout society and on the protection of individual rights and/liberties. While both virtues could recommend many of the same courses of action, justice works to ensure that technological advances benefit and do not harm communities. Farrelly argues that, when applied to genetic technology, these virtues yield a number of recommendations that an ethical policymaker would endorse. He then applies these virtues to key applications of genetic technology to outline specific social or ethical positions. The subsequent chapters tackle weighty topics from eugenics to reproductive rights.

In chapter one, the author tackles one of the most contentious topics in genetic ethics: Eugenics, or the idea that scientific knowledge can be used to improve the human population by increasing the occurrence of “desirable” characteristics (Kevles 2016). This turn in the text is not surprising, as humanity currently stands on a precipice. We now possess the technology needed to reshape hereditary capacities and to take charge of evolution itself. As such, eugenics is “an elephant in the room” for genetic ethics and has a highly contentious past. Thus, before presenting Farrelly’s argument, this history should be noted in order to place such discussions in historical context. This is not intended to “muddy the water,” but to acknowledge the highly problematic history of eugenics & the ways that genetic knowledge has been historically used to justify unjust and unethical practices. While eugenics was discussed by Charles Darwin, it fell into disfavor during the twentieth century when Nazi Germany enlisted the state to establish eugenic policies and the US instituted “race-improvement” policies. According to Kevles (2016),

“the dreams of all the eugenicists went awry... because of increasingly controversial efforts by governments to get rid of the undesirables from the top down. Many U.S. states enacted laws authorizing compulsory sterilization of people considered unworthy and sterilized some 36,000 hapless victims by 1941. The Nazis went much further, subjecting several hundred thousand people to the gonadal knife and eventually herding some 6 million Jews—their ultimate undesirables—into the death camp” (p.46).

Recognizing the historical uses of genetic knowledge to support policy positions is imperative for fully understanding and assessing the potential impacts of technological innovations that could make the “dream” of eugenicists a reality. Farrelly, himself, does not shy away from this history.

Specifically, Farrelly argues that the fear that biotechnology will take us down the same path is not a sufficient reason for viewing eugenics as wholly immoral. For Farrelly, “eugenic aspirations can be morally defensible, even morally obligatory, when they pursue empirically sound and morally justified aims” (p. 22). By using virtue ethics to help guide what governments/policy-boards should do and allow (remember, that Farrelly is focusing on collective action), we have the ability to identify acceptable applications of genetic technology from unacceptable ones. Policies “must be considered on its own merits and demerits, rather than treated as one *monolithic* type of intervention” (p.13). It would be foolish to forfeit new genetic technologies, such as gene therapy and gene editing, that could promote equity, health, and happiness. Intellectual virtues require that we recognize facts & have the humility to remain cautious. Benevolence requires that we utilize this technology in ways that benefit others & prevent avoidable harms. And justice limits the burdens that are placed on individuals to obtain some collective good. With this framework in place, good policymakers, who are motivated by these virtues, will be able to weigh each potential application and determine if it ethically justified.

I appreciate Farrelly’s application of virtue ethics and, especially, his argument that justice should play a prominent role guiding genetic decision-making. If justice frameworks are in place, then I agree that this could help mitigate problematic applications of biotechnology. My worry concerning his ethical position, however, centers on the “virtuous” policymakers that he argues should be making these decisions. As Farrelly is not interested in individual but collective decision-making, his virtue ethic depends on good policymakers guided by the specific virtues that he identifies. However, since the inception of virtue ethics, the development of moral virtue was seen a life-long journey that is fraught with experiencing moral excess, in addition to moral excellence. Thus, finding a virtuous policymaker, in the Aristotelian sense, could be difficult if not impossible. Even if we had virtuous policy makers, expertly applying virtues to complex situations is a difficult task, fraught with potential missteps. This is especially the case with applications of emerging technologies, as ethicists themselves find it hard to come to consensus. Though this lack of consensus may be one of the reasons why Farrelly weighs and then attempts to discard several competing ethical frameworks throughout the book.

To illustrate the complexity of using virtues to guide action, let’s return to the case above, where He Jiankui altered the genomes of twin girls (Normile 2018). One could argue that

modifying the children so that they are less likely to be infected with HIV fulfills the virtue of benevolence as it protects them from avoidable harms. However, this modification may have caused mutations in various other parts of the genome that has unpredictable health consequences for the children. Thus, it also violates the virtue of benevolence. When faced with unknown phenotypic and genotype changes, I doubt that even purely virtuous policymakers have the information necessary to make fully informed decisions. Missteps could be highly damaging and risky, especially when Farrelly argues that we should not utilize the precautionary principle when applying such technology. Additionally, focusing on mandating genetics policy from a societal, rather than an individual level, is problematic when placed in a historical context, as top-down applications of eugenics policies led to an array of injustices. While the virtue of justice is intended to block such applications, unless we have truly virtuous policymakers, I am wary of arguments that support top-down measures. In later chapters, Farrelly defends social engineering utilizing epigenetics as a justification for making substantial top-down changes to society. However, without discussing who should be making such decisions beyond the abstract, there are worries concerning whether the “good” that one social group identifies is the “good” that others also ascribe to. This is especially the case when genomics changes could include a wide range of individual and collective benefits and harms. Thus, while Farrelly discusses biomedical policymaking in the chapter on the genetic revolution, more attention to the ethical and justice implications of who identifies and assesses benefits and harms would have strengthened his approach.

With this being said, I applaud Farrelly’s courage in not shying away from contentious issues in bioethics and genetic ethics. His application of virtue ethics is novel but still draws on the strong bioethical foundation of applying principles to cases in order to help determine right action. As such, interdisciplinary readers familiar with bioethics may find it to be highly readable and engaging. I certainly did. In addition, Farrelly’s arguments are well reasoned and clear. As a scholarly work, *Genetic Ethics: An Introduction* is a definitive contribution to the field. I highly recommend that it be read by bioethicists and those interested in genetic ethics. We are living in an age where biotechnologies have made it possible to take charge of evolution itself. This could provide us with opportunities to improve human flourishing, but could also bring about a wide range of injustices. Farrelly’s open and candid discussion of both the promises and perils of biotechnology is important reading for all of us.

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