

Can bioethics be an honest way of making a living?

A reflection on normativity, governance and expertise

Abstract

The authority of bioethics as a field of inquiry and of bioethicists as scholars with a distinctive expertise is being challenged on various fronts. Sarah Franklin's *Nature* commentary "Ethical research – the long and bumpy road from shirked to shared" is the latest example of one such challenge. In this paper, we respond to these challenges by focusing on two key issues. Firstly, we discuss the theory and practice of bioethics. We argue that both of these endeavours are fundamental components of this field of inquiry and that bioethics cannot be reduced to the contribution that it makes to the production of bio-policy, as Franklin suggests. Secondly, we contend that bioethicists have distinctive skills and knowledge that place them at an epistemic advantage in discussing normative questions. Hence, we reject views that deny the specific contribution that bioethicists can bring to assessing the ethics and governance of science and technology. We conclude by arguing that—despite formal and substantive differences between disciplines—philosophers, social scientists and other scholars should join forces and engage in critical friendships rather than turf wars to move towards the just governance of science and technology.

Introduction

The authority of bioethicists as scholars with a distinctive expertise in discussing the ethical implications of new and emerging biotechnologies, biomedicine and life sciences is being challenged on different fronts. Can bioethics still be considered an honest way of making a living? This is our departing question in this paper, one which we address by responding to some of the challenges that have been advanced against bioethics and bioethicists' work. An initial set of challenges to bioethics comes from invitations to 'get out of the way' of scientific and technological advances. One notable example is Steven Pinker's piece for the *Boston Globe*, which argues that bioethicists have a 'moral imperative' to get out of the way of the "vast increases in life, health and flourishing" that the development of CRISPR genome editing technologies can bring about [1]. Motivating invitations of this kind is the perception that bioethicists' primary function is to stifle scientific 'progress' and to police technological advancements that contribute to human flourishing. This line of reasoning presupposes a linear

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mode of understanding science and innovation, which has been repeatedly debunked [2,3]. A second set of challenges comes from the increasing rejection of expert knowledge in a variety of contexts [4,5], due to an endemic lack of trust in experts, alongside other factors specific to the field of bioethics, which we discuss below. Finally, there are challenges to the epistemic authority of bioethicists, often framed in ways that deny that bioethicists can meaningfully contribute to debates on science and technology. Such challenges, as we shall show, come both from within this field of inquiry and from neighbouring fields.

Sarah Franklin's commentary in *Nature* "Ethical research – the long and bumpy road from shirked to shared" is an example of this last set of challenges [6]. There, Franklin contends that bioethics has exhausted its function after the promises of the Human Genome Project have not been fulfilled and argues that ethical oversight now belongs to a multiplicity of actors rather than being the exclusive domain of bioethics. On the one hand, what Franklin is arguing is trivially true: it is uncontentious to regard (the majority of) human beings as moral agents, i.e. agents who ought to engage in ethical reasoning and ought to be held responsible for their actions. It is also true that ethical oversight belongs to a multiplicity of actors: bioethicists have always sat on advisory boards and ethical committees alongside other scholars and members of the public. Moreover, Franklin rightly maintains that scientists—and other scholars—should engage with the ethical implications of their research. Jennifer Doudna, who—together with Emmanuelle Charpentier—firstly employed CRISPR and endonuclease Cas9 as a gene editing technique, is one such scientist who has not shirked from the ethical implications of her research. The final chapter of her book *A Crack in Creation*, co-written with Samuel Sternberg [7], directly engages with the ethical questions raised by CRISPR. It discusses slippery slopes and the rising spectre of eugenics, and it narrates a nightmare about Hitler coming back from the dead to use this technology to pursue evil ends. What the chapter does not include is an engagement of any sort with the relevant bioethical literature. Doudna falls within a tradition of scientists who have claimed for themselves the expertise of dealing with the ethical issues arising from biotechnology. This tradition dates back to the 1975 Asilomar Conference, where scientists gathered to discuss the ethics and governance of recombinant DNA and called for a temporary moratorium on this technology.

Whilst the issues that Franklin raises are valid, it is our contention that Franklin's representation of bioethics is not entirely accurate. Bioethics is a field of inquiry which comprises a variety of methodologies and approaches. As such, it provides fertile ground for bringing together scholars with different backgrounds and expertise [8,9]. However, one

distinctive characteristic feature of bioethics lies in its normative nature. Bioethics requires specific training in critical thinking and moral philosophy, to reason through the complex normative questions raised by biotechnologies, biomedicine and the life sciences. While ethical oversight is not, nor should it be, the realm only of bioethicists, we argue that bioethicists are at an epistemic advantage when reasoning over bioethical questions. Hence, whilst Franklin's plea for broadening engagement with ethical matters beyond ethicists is a laudable goal, we question whether non-ethicists are equally equipped to address these normative questions and whether bioethics has exhausted its function, as she argues.

Our view is that ethics expertise cannot be improvised, and that ethicists are better placed than non-experts, i.e. they are at an 'epistemic advantage', when discussing the normative questions raised by biotechnologies, biomedicine and the life sciences. In this paper, we propose an alternative reading of the history and practice of bioethics. Our reading differs from Franklin's and arguably more appropriately represents bioethics as a field of inquiry with a multiplicity of actors and functions, but a unique type of expertise. A note on terminology: in this paper, we use the words 'bioethicist' and 'ethicist' interchangeably. We refer to bioethicists as a subset of ethicists who deal with issues arising out of the life sciences.

Bioethics: Theory, Practice and Activism

Social scientists have long criticised philosophical bioethics for being unaware of or simply indifferent to the power hierarchies at work in medicine and science, and to the technological determinism that drives science itself forward [10–12]. However, as the field of bioethics has evolved, philosophers and social scientists have found themselves increasingly sharing a territory and addressing similar questions, which investigate the ethical and social implications of advancements in science and technology [13,14]. Notwithstanding these critiques, and the grain of truth that lies in them, we consider bioethics to be an honest way of making a living. Whether bioethics is an honest way of making a living is a question that Samuel Gorovitz¹ posed more than thirty years ago. In his paper "Baiting bioethics" [15], Gorovitz responded to ten critiques moved to the at that time infant field of bioethics². The paper addresses many critiques that are still vividly discussed today, including for instance that

¹ We are grateful to an anonymous reviewer for bringing this paper to our attention.

² Peter Singer, in 1976, defined bioethics a 'flabby infant' and stated: "[y]et bioethics is still in its infancy, and its rich diet of foundation grants and government sponsorship has made it a flabby infant rather than a tough adolescent" [16].

Bioethics has no legitimate methodology; no foundations; no practical or conceptual utility; no place in universities or in public policy. Gorovitz engages closely with Renee Fox and Judith Swazey's 'attack' on bioethics and in particular on the role that analytical philosophy plays within bioethics [17]. In a sense, the challenges to bioethics outlined in the introduction of this paper can be read as contemporary iterations of that debate. However, as Gorovitz argued more than thirty years ago, Fox and Swazey inaccurately reported the role that analytical philosophy plays in bioethics. Franklin makes similar errors, in our view, in her *Nature* commentary. However, as Gorovitz pointed out, these critiques contain a grain (or maybe more) of truth. Let us discuss these 'grains' and the views that we find wanting.

Franklin outlines the emergence of bioethics through key events in the US and UK. She evokes images of 'armies of ethicists' combing through philosophical principles but being left 'unmoored' and in 'uncharted territories' as easy and inflated prospects of bench to bedside applications raised by the Human Genome Project faded [6]. Bioethicists, it is true, have often fallen prey to what Adam Hedgecoe has defined the 'reinforcement of socio-technical expectations' and to apotropaic promises of the latest technology [18]. Philosophers and theologians were indeed recruited to provide advice on initiatives such as the regulation of assisted reproduction and embryo research, or the Human Genome Project. They hence played a key role, as outlined by Franklin, in the development of bioethics as field and in its engagement beyond academia with social and political questions surrounding technological and scientific advancements.

A key example of these scholars' involvement in policy-making, which Franklin refers to and which exemplifies the multiplicity of roles and functions of bioethics, is the work of Baroness Mary Warnock in the UK. Warnock was appointed chair of the committee that led to the *Report of the Committee of Inquiry into Human Fertilisation and Embryology*, published in 1984, which formed the basis of the Human Fertilisation and Embryology Act in 1990. Warnock was a philosopher and, as historian Duncan Wilson points out, contributed to 'the making of British bioethics' [19] whilst at the same time rescuing moral philosophy from what she diagnosed as a reluctance to engage with practical matters [19,20]. The committee's report and Warnock's role as the committee's chair were pivotal to the production of bio-policy in the UK, i.e. to the set of regulations that de facto became the legal framework of assisted conception and embryo research, and to the establishment of the Human Fertilisation and Embryology Authority (HFEA) in 1990. Despite Warnock's contribution to creation of the HFEA and the 1990 Act, at the time, fellow philosophers criticised her on several counts. In

particular, they challenged the pragmatic nature of her approach and her failure to engage with what philosophers viewed as substantive or foundational moral questions about the moral status of the embryo [19,21]. Indeed, Warnock's approach privileged views that would not, paraphrasing from the committee's chair herself, 'loosen society's cement or undermine its fabric' [22]. The committee, under Warnock's lead, did not set to discern questions concerning the moral status of the human embryo, the moral acceptability of assisted conception, the concept of personhood, and so forth. Rather, they aimed to develop a framework to govern contested practices in a morally pluralistic society.

As demonstrated by the extensive literature on these questions, however, there is much more to the ethics of embryo research and assisted reproduction than what the committee discussed. Scholars such as Peter Singer [23,24] and John Harris [25], among many others, were reflecting on these substantive questions and producing scholarship that sought to assess them, in the very same years during which the committee operated³. We do not intend to provide here an exhaustive account of the work of philosophers during these years and of their engagement with the nascent field of bioethics. Rather, these examples are meant to show that—contrary to what Franklin seems to imply—there was more to bioethics than chairing committees and offering recommendations, and that the academic and public faces of bioethics were interconnected, but also, we argue, distinct endeavours.

Such simultaneous interconnectedness and distinctiveness of the theory and practice of bioethics, and of its academic and public faces, is exemplified in Warnock's work and in the criticism she received. Moreover, due to the inherently political nature of the questions that bioethics addresses, its theory and practice are on a continuum. Today, as back then, philosophers and theologians—and the scholars from other disciplines who have more recently joined in—also perform both theoretical and more politically engaged work when addressing ethical questions raised by science and technology. They sit on committees tasked with addressing these questions alongside social scientists, lawyers, other scholars and members of the public, among other actors. Beyond these formal roles, some bioethicists are activists and spearhead campaigns for reproductive rights, environmental protection, global health issues, care of disabled members of society, and so forth. Increasing attention is being given to activism within bioethics, as exemplified by the number of papers on this issue in the last few years [26–28].

³ For an account of their and other philosophers' work on these questions, see Wilson's history of bioethics in the UK [19].

The practice and function of the field of bioethics is not, however, limited to the involvement of bioethicists in committees or campaigns. Rather, it is an instance of how these scholars are involved in the making of bio-policy. There will inevitably be cases along the continuum in which it is difficult to distinguish the different roles, as the same scholar will engage with both theory and practice. However, this does not mean that the roles of the bioethicist cannot be distinguished from one another. Bioethics, then and now, should not be interpreted as a field engaged with *either* practice *or* theory: both these enterprises are part of this field of inquiry. The plethora of endeavours that Franklin describes does not amount to a fair representation of bioethics, for she conflates the academic discipline of bioethics with its representation in governance bodies. Bioethics is a field of inquiry that informs some of the reflections of these bodies—whose work in turn is constrained by political mandates, aims and external oversight.

Expertise in Ethics

Can and should we all be ethicists, as Franklin argues? There are two ways of interpreting Franklin’s concluding words. Firstly, they could be interpreted as a call directed to scholars from various disciplines as well as members of the public to engage, together, with complex ethical questions; to be held accountable for our actions; to reason over the consequences of these actions; and to be aware of the duties that we have to one another. In this sense, Franklin is just asking us to be good people and be mindful that there are times when such goodness is especially needed. Alternatively, the ‘we should all be ethicists’ plea can be interpreted in line with a tradition that questions the very existence of the category of expertise in ethics. In Benjamin W. Hurlbut’s words:

[B]ioethics claims expertise in matters of moral judgment, matters that in secular, liberal, public life tend to be seen as belonging to the sphere of private belief and personal judgment—that is, as the sorts of things about which there can be no superior expertise. [29]

Regrettably, we cannot know for sure what Franklin’s intention was. If the former interpretation reflects what she wanted to convey in her commentary, then we cannot but agree with her. The more people who reflect on the ethical dimensions of their actions and of their being in the world, the better. Considering current scientific and technological advancements—and the pace of these advancements—it is desirable for people to be more ethically mindful

and aware. If, instead, the latter interpretation more fairly reflects Franklin’s views on expertise in bioethics, then we find ourselves disagreeing with her. We do not think that we can all be ethicists [30]. On the contrary, we value a certain type of training and skills in moral philosophy which we believe give ethicists an epistemic advantage over non-ethicists in addressing normative questions.

Many readers of the *Journal of Medical Ethics* will be physicians or health professionals. If you are one of them, how would you respond to the plea that we should all be physicians, and that anyone’s word should count as much as yours? You might be sceptical as to whether this could or rather *should* be the case. However, you could also respond that medicine, unlike ethics, is an evidence-based practice and that this is what makes claims of expertise possible for the former but not for the latter. Whether ethics is indeed similar to medicine—i.e. an evidence-based practice where moral truths and facts count as the ‘evidence’—is a contested matter in philosophy [31–33]. Broadly, this depends on one’s view on metaphysical matters, i.e. whether there are mind-independent moral facts and truths, and on epistemological matters, i.e. whether these facts and truths can be known [32].

Due to space constraints, we cannot enter into these discussions here. For the purpose of this paper, we adopt what we consider a middle-ground view on expertise in ethics, one that remains agnostic as to whether ethicists have this preferential access to moral facts and truths, but that attributes to them a certain kind of expertise by virtue of their training in and knowledge of moral philosophy. Bioethics is at its core a normative enterprise, i.e. it aims to address questions related to what should or should not be done with regard to a particular issue. Bioethicists, by definition, are trained in the normative evaluation of biotechnologies, medical practices and other endeavours with impact on human and non-human forms of life. This expertise entails both distinctive skills and knowledge [31]. Ethicists, by virtue of their training, are particularly skilled in spotting unjustified inferences, clarifying and analysing concepts, and constructing, assessing and debunking arguments. They also have knowledge of ethical theories, principles, dilemmas and of the multiple ways in which these have been criticised and defended. Moreover, as Nathan Emmerich argues, one could say that “bioethicists cannot refuse to understand themselves as experts when they clearly act as such” [34].

However, we appreciate that knowledge of and training in moral philosophy are not sufficient for successful work in bioethics. As part of their public role, bioethicists are often asked to comment on recent developments or controversies and make judgments about the most appropriate course of action. As such, it is critical that they understand the relevant features of

a particular issue or controversy and the historical, social and political context in which it is situated. In order to do that, bioethicists need to develop a relational or interactional type of expertise [34], which in Harry Collins' and Robert Evans' words means being able to grasp 'the conceptual structure of another's world' or 'talk the talk' of different disciplines [35]. This type of expertise is an essential component of successful 'trading zones' between disciplines and of an appropriate normative evaluation of biotechnologies and medical practices, especially in the public domain.

A Shared Territory

Bioethics has evolved since it emerged in the 70s and it is not the sole domain of philosophers. Today, philosophers, social scientists and other scholars find themselves increasingly sharing a territory, that of reflections on the ethical implications and governance of science and technology. Within this territory, there is what we believe to be an important 'division of cognitive labour' [36], but also an inevitable exchange of expertise, approaches and aims, which should be equally welcome. Social scientists working in the field of bioethics are trained in identifying implicit normativity in technologies and practices; in unveiling power relations; and in engaging in the deconstruction of (social) realities. They can also bring to the attention of philosophers the importance of democratic forms of engagement when they move from academic reflections to public policy. Finally, they can provide empirical data and grounded analyses that both meaningfully inform and constrain philosophers' reflections, forcing them to grapple with the complexities of the realities they are trying to dissect and assess.

Philosophers, in turn, can do some good old 'philosophical plumbing', as Mary Midgely once put it [37]. They can, as discussed above, contribute with their distinctive skills and knowledge to these discussions. Ultimately, they can provide reflections that seek to address 'ought' questions, the sort of endeavour where they have an at epistemic advantage. However, in moving from academia to policy-making, philosophers engaged in the field of bioethics need to recognise that there can be more than one ethically justifiable course of action in relation to a certain technology or medical practice [38]. They should also be aware that which course of action might be more ethically justifiable will depend on multiple factors. These factors include for instance: the social and political context in which science and technologies operate; an analysis of the values intrinsic in the design of a technology; and empirical data about how science and technologies go about shaping current societal arrangements, among other issues.

In addition to this, it is important to welcome social scientists' critical takes and their calls for democratising (the governance of) science and technology. But these calls ought to be distinguished from endorsing social consensus as a good in its own right. Broad-based forms of engagements, open dialogues between experts and non-experts and moves towards what Philip Kitcher refers to as the 'well-ordered science' [39] should be encouraged. But they cannot replace ethical analysis and the constant questioning of the status quo. The stakes (and the risks for disadvantaged groups) of reducing what is 'good' to what 'people think' are too high.

Conclusion

In this paper, we have discussed a number of challenges that have been raised against bioethics by critics of different stripes. We have focused in particular on claims regarding expertise in ethics and the role of ethicists in addressing normative questions concerning scientific and technological advances. Our departing question in this paper focused on whether bioethics amounts to an honest way to make a living. The, perhaps partisan, answer that we have given is that it does. Ethicists have an epistemic advantage in addressing normative questions concerning science and technology, and their particular skills and knowledge enable them to make significant contributions to decision-making and policy development in these areas. It is in this sense that ethical expertise cannot be improvised: it requires training.

Although, as Gorovitz argues, our capacity to resolve moral problems remains imperfect, "there remains a difference between thinking about them well and thinking about them badly" [15]. This is an important distinction and, we believe, one that needs to be guiding the work of philosophers, social scientists and other scholars working in the field of bioethics. Moreover, we believe that these scholars should be critical friends rather than engaging in turf wars. This is especially relevant as they are jointly tasked with critically reflecting on and dissecting complex questions concerning the ethics and governance of science and technology. Our aim in this paper has been to propose an approach that fosters productive engagements between philosophers and social scientists, and that takes advantages of—rather than trying to silence—the heterogeneous expertise of involved actors. The road towards the just governance of science and technology in democratic societies is indeed long and bumpy. Experts in different fields, as well as members of the public, should join forces to cooperatively move towards this end.

References

- 1 Pinker S. The moral imperative for bioethics. *The Boston Globe*. 2015.<https://www.bostonglobe.com/opinion/2015/07/31/the-moral-imperative-for-bioethics/JmEkoyzlTAu9oQV76JrK9N/story.html> (accessed 11 Nov 2019).
- 2 Jasanoff S, Kim S-H, editors. *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. Chicago, IL: : University of Chicago Press 2015.
- 3 Marris C. The construction of imaginaries of the public as a threat to synthetic biology. *Science as Culture* 2015;**24**:83–98. doi:10.1080/09505431.2014.986320
- 4 Camporesi S, Vaccarella M, Davis M. Investigating public trust in expert knowledge: Narrative, ethics, and engagement. *Bioethical Inquiry* 2017;**14**:23–30. doi:10.1007/s11673-016-9767-4
- 5 Attwell K, Leask J, Meyer SB, et al. Vaccine rejecting parents' engagement with expert systems that inform vaccination programs. *Bioethical Inquiry* 2017;**14**:65–76. doi:10.1007/s11673-016-9756-7
- 6 Franklin S. Ethical research — the long and bumpy road from shirked to shared. *Nature* 2019;**574**:627–30. doi:10.1038/d41586-019-03270-4
- 7 Doudna J, Sternberg S. *A crack in creation: The new power to control evolution*. London, UK: : The Bodley Head 2017.
- 8 Iltis A S. Look who's talking: the interdisciplinarity of bioethics and the implications for bioethics education. *Journal of Medicine and Philosophy* 2006;**31**:629–41. doi:10.1080/03605310601009299
- 9 Iltis AS, Carpenter A. The “s” in bioethics: Past, present and future. In: Engelhardt HT, ed. *Bioethics Critically Reconsidered: Having Second Thoughts*. Dordrecht, NL: : Springer Netherlands 2012. 123–49. doi:10.1007/978-94-007-2244-6_7
- 10 Turner L. Anthropological and sociological critiques of bioethics. *Bioethical Inquiry* 2009;**6**:83–98. doi:10.1007/s11673-008-9130-5
- 11 Fox RC, Swazey JP. Examining American bioethics: Its problems and prospects. *Cambridge Quarterly of Healthcare Ethics* 2005;**14**:361–73. doi:10.1017/S0963180105050504
- 12 López J. How sociology can save bioethics... maybe. *Sociology of Health & Illness* 2004;**26**:875–96. doi:10.1111/j.0141-9889.2004.00421.x
- 13 Borry P, Schotsmans P, Dierickx K. The birth of the empirical turn in bioethics. *Bioethics* 2005;**19**:49–71. doi:10.1111/j.1467-8519.2005.00424.x
- 14 Ives J. “Encounters with experience”: Empirical bioethics and the future. *Health Care Anal* 2008;**16**:1–6. doi:10.1007/s10728-007-0077-1

- 15 Gorovitz S. Baiting bioethics. *Ethics* 1986;96:356–74. doi:10.1086/292753
- 16 Singer P. ‘Bioethics’: The case of the fetus. *The New York Review of Books* 1976;23.https://www.nybooks.com/articles/1976/08/05/bioethics-the-case-of-the-fetus/ (accessed 8 Mar 2020).
- 17 Fox RC, Swazey JP. Medical morality is not bioethics—medical ethics in China and the United States. *Perspectives in Biology and Medicine* 1984;27:336–60. doi:10.1353/pbm.1984.0060
- 18 Hedgecoe A. Bioethics and the reinforcement of socio-technical expectations. *Soc Stud Sci* 2010;40:163–86. doi:10.1177/0306312709349781
- 19 Wilson D. *The making of British bioethics*. Manchester, UK: : Manchester University Press 2014. https://www.research.manchester.ac.uk/portal/en/publications/the-making-of-british-bioethics(485c1b3b-6827-47f9-858d-916510566e8c).html (accessed 30 Jan 2020).
- 20 Wilson D. Creating the ‘ethics industry’: Mary Warnock, in vitro fertilization and the history of bioethics in Britain. *BioSocieties* 2011;6:121–41. doi:10.1057/biosoc.2010.26
- 21 Cavaliere G. A 14-day limit for bioethics: The debate over human embryo research. *BMC Medical Ethics* 2017;18:38. doi:10.1186/s12910-017-0198-5
- 22 Warnock M. Moral thinking and government policy: The Warnock Committee on Human Embryology. *The Milbank Memorial Fund Quarterly Health and Society* 1985;63:504–22. doi:10.2307/3349845
- 23 Singer P. *Animal liberation*. 2002 edition. New York, NY: : Harper Collins 2002.
- 24 Singer P, Singer DP of BP. *Practical Ethics*. Cambridge, UK: : Cambridge University Press 1993.
- 25 Harris J. *The value of life: An introduction to medical ethics*. 1 edition. London, UK: : Routledge 1985.
- 26 Gordijn B, ten Have H. Normative approaches and activism in global bioethics. *Med Health Care and Philos* 2015;18:293–4. doi:10.1007/s11019-015-9652-7
- 27 Scully JL. The responsibilities of the engaged bioethicist: Scholar, advocate, activist. *Bioethics* 2019;33:872–80. doi:10.1111/bioe.12659
- 28 Rogers W. Bioethics and activism: A natural fit? *Bioethics* 2019;33:881–9. doi:10.1111/bioe.12558
- 29 Hurlbut BJ. *Experiments in democracy: Human embryo research and the politics of bioethics*. New York, NY: : Columbia University Press 2017.
- 30 Camporesi S, Cavaliere G. We cannot all be ethicists. *Nature* 2020;575:596. doi:10.1038/d41586-019-03661-7
- 31 Crosthwaite J. Moral expertise: A problem in the professional ethics of professional ethicists. *Bioethics* 1995;9:361–79. doi:10.1111/j.1467-8519.1995.tb00312.x

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- 32 McGrath S. Moral disagreement and moral expertise. In: Shafer-Landau R, ed. *Oxford Studies in Metaethics: Volume III*. Oxford, UK: : Oxford University Press 2008.
- 33 Singer P. Moral experts. *Analysis* 1972;32:115–7. doi:10.2307/3327906
- 34 Emmerich N. A sociological analysis of ethical expertise: The case of bioethics. *Cogent Social Sciences* 2016;2:1143599. doi:10.1080/23311886.2016.1143599
- 35 Collins H, Evans R, Gorman M. Trading zones and interactional expertise. *Studies in History and Philosophy of Science Part A* 2007;38:657–66.
doi:10.1016/j.shpsa.2007.09.003
- 36 Kitcher P. *Science in a democratic society*. Amherst, NY: : Prometheus Books 2011.
- 37 Midgley M. Philosophical plumbing. *Royal Institute of Philosophy Supplements* 1992;33:139–51. doi:10.1017/S1358246100002319
- 38 Wolff J. *Ethics and public policy: A philosophical inquiry*. Abingdon, UK: : Routledge 2011.
- 39 Kitcher P. *Science, truth, and democracy*. New York, NY: : Oxford University Press 2003.