

Fourth International Conference on New Directions in the Humanities
University of Carthage, Tunis, Tunisia
3-6 July 2006

Technological Futures and Non-Reciprocal Responsibility

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1. Introduction

There is a fundamental gap between the technologically-enhanced power of industrial societies to create futures, and the ability of agents within these societies to take responsibility for the kinds of futures they create. The recent resurgence of interests in nuclear power as a means of supplying energy needs without generating net positive carbon emissions is an acute example. Two issues that accompany any implementation of nuclear technology take us to the heart of the problem: the future costs of decommissioning, and the related problem of how to store high-level nuclear waste. In the United Kingdom, the cost of cleaning up existing generation facilities as they reach the end of their useful lives was recently estimated at £90bn.¹ This figure confirms the tendency for estimates of decommissioning costs to increase unpredictably over time, given the ways in which scientific understanding of the problems involved in decommissioning tends to change, together with the evolution of regulatory frameworks.² The costs of implementing nuclear energy supply have always to be met by future generations, given that the lifetime of a nuclear plant typically ranges from 30 to 50 years, and the process of decommissioning and clean-up for the current generation of plants in the UK is expected to continue for at least 100 years and probably longer still.³

As for high-level nuclear waste, no internationally-agreed method of storage exists. The latest guidelines from the UK government-appointed Committee on Radioactive Waste Management (CoRWM) suggest that 'geological disposal' will be the method to be used in the UK clean-up programme.⁴ This has been the solution promoted in the USA, at the troubled Yucca Mountain facility in Nevada. However, any solution must be secure for thousands of years, and establishing such a degree of safety requires a degree of scientific certainty about the complex interactions within geological structures that cannot be guaranteed for such a time period.⁵

Future generations are hardly visible in the new nuclear energy debates. Instead, concern is for the problems of the present, despite the vast uncertainties that cloud any estimate of the effects on future generations of nuclear power's hidden costs. Among the numerous reasons why this emphasis goes unchallenged is a clear and widespread failure to articulate what the responsibilities of the present to the future actually are. In moral philosophy, the problem of intergenerational equity is a notoriously tricky one, whose pressing urgency has only quite recently been recognised.⁶ I want to suggest here that the problem lies in how the foundations of

¹ Oliver Morgan, "Nuclear Costs to Hit £90bn, Warns Brown" *The Observer*, 04/06/06.

² *Trends in Nuclear Decommissioning Costs* (TLG Services, [cited 28/06/06]; available from <http://www.tlgservices.com/corprate/trends.htm>).

³ Nuclear Decommissioning Authority, *Managing the Nuclear Legacy: A Strategy for Action* (Department of Trade and Industry, 2002 [cited 28/06/06]; available from http://www.nda.gov.uk/documents/white_paper_-_managing_the_nuclear_legacy_a_strategy_for_action.pdf), p. 12.

⁴ *Corwm's Draft Recommendations* (Committee on Radioactive Waste Management (CoRWM), [cited 28/06/06]; available from <http://www.corwm.org.uk/pdf/None%20-%20CoRWMs%20Draft%20Recommendations%2027%20April.pdf>), p. 1.

⁵ On the incidence of earthquakes in the region over a 20-year period from 1976-1996, see State of Nevada Nuclear Waste Project Office, USA, *Earthquakes in the Vicinity of Yucca Mountain* (State of Nevada Agency for Nuclear Projects, [cited 28/06/06]; available from <http://www.state.nv.us/nucwaste/yucca/seismo01.htm>).

⁶ Peter Laslett, and James S. Fishkin, "Introduction: Processional Justice," in *Justice between Age Groups and Generations*, ed. Peter Laslett and James S. Fishkin (New Haven and London: Yale University Press, 1992), pp. 6-7.

responsibility are understood. The dominant interpretation of these foundations as rights held by individuals produces a bias in favour of the present at the expense of the future. An alternative, future-oriented form of responsibility must be articulated in response.

2. Rights, Reciprocity and Accountability

Consider how responsibility commonly operates as a concept within moral and legal frameworks. Legal responsibility for harm is usually based either on fault or liability. If someone is at fault, then their intention to harm makes them culpable. If they are found liable, then it is the fact of their involvement in the production of harm that does so.⁷ What is presupposed by both views is a moral concept of the right not to be harmed. The concept of such a right rests on the idea that human beings have intrinsic and equal moral worth, and therefore possess certain inalienable rights. Commonly, this intrinsic worth of human beings is seen as rooted in their unique power to link action with rationality, as when Kant defines moral autonomy as the ability to decree for oneself, and freely follow, a rule of conduct.⁸ The equal worth of all individuals morally secures their equality before the law, and imposes duties on individuals that are reciprocally binding.

This moral framework also requires an epistemological one in which accountability can be established. A public standard of truth must operate so that the responsibility of an agent for an event can be demonstrated and agreed upon. That such a standard is assumed presupposes in turn the equal rationality of moral agents. Within contemporary industrialised societies, the reliance on expert scientific witnesses in court provides this standard.

Once responsibility towards future generations is in question, rather than present responsibilities to others, both these frameworks prove deficient. Firstly, the protection granted to living persons by legal rights does not apply to members of future generations. They have no voice to protest against, say, the imposition of a duty to bear nuclear decommissioning costs. Secondly, legal liability for the effects of actions can typically be avoided if it can be shown that all possible measures for avoiding harm, based on scientific knowledge of risks current at the time of acting, had been taken. If certain risks are not predicted at the time of acting, then no-one can be held responsible for the unforeseen effects.⁹ For example, who would be liable for harm arising from future contamination of the water table by deeply buried nuclear waste, following an unusually severe earthquake, given the unpredictability of such events? Nonetheless, without the decision to bury the waste and impose a future unquantifiable risk, harm would not have been committed.

The problem here is the temporal bias of the assumptions that guide these two frameworks. To take the issue of accountability first: typically, the use of scientific knowledge to establish responsibility assumes that past and present are a reliable guide to the future. But the example of nuclear power demonstrates that the operational context of advanced technologies is inescapably complex. Radical uncertainty as to the future consequences of a technology is here not accidental, but built in to the technology itself. The production of nuclear waste and the need for long-term decommissioning mean that nuclear power is necessarily embedded in a context that is thrown open to unforeseeable long-term complexities. In such an arena, the usefulness of scientific evidence as a standard of accountability is very limited. Earthquakes are inherently unforeseeable, the economic influences on decommissioning costs entirely unpredictable. When complexity and the unquantifiability of risks inhere in the operational context of a technology, then that technology poses a problem for the concept of liability itself.

As for the concept of rights, the problem here is the sense in which a right is a present claim by moral agents on certain kinds of treatment. On this definition as future generations do not yet exist, they can neither claim anything for themselves, nor appoint someone else to exercise or

⁷ On this distinction, see Tony Honoré, *Responsibility and Fault* (Oxford: Hart Publishing, 1999), 'Responsibility and Luck'.

⁸ Immanuel Kant, *Groundwork for the Metaphysics of Morals*, trans. James W. Ellington (Indianapolis: Hackett, 1993), pp. 40-1.

⁹ Luigi Pellizzoni, "Responsibility and Environmental Governance," *Environmental Politics* 13, no. 3 (2004), p. 552.

defend their rights for them.¹⁰ If this is the case, then future generations cannot be treated with the same respect as those already living, which effectively denies them the intrinsic dignity that all humans are held to possess.

Both frameworks therefore reflect an inherent temporal bias in legal and moral thinking. Responsibility and accountability are thought of as reciprocal relationships between contemporaries. Rights mark out horizontal zones of moral inviolability that defend one living individual from another. Accountability presupposes the reciprocal acceptance of a common standard of truth. But the assumption of reciprocity counts against the moral status of future generations, with whom reciprocity is impossible.

3. *Non-Reciprocal Responsibility, Commitment and Care*

In fact, the relationship between present and future generations is fundamentally unequal. In this, it resembles not a reciprocal relationship between contemporaries, but a non-reciprocal one such as that between parents and children. How can this non-reciprocal responsibility of the present be understood? Hans Jonas has written that in the contemporary world, technological power brings with it increased responsibility for what happens when that power is exercised, given its temporal reach.¹¹ The idea of reciprocal responsibility implies the idea that all moral agents have the power (which they can either exercise or not) to wrong you by ignoring your rights. But in relation to the future, everyone has a different degree of power to transform it by participating in its creation, in ways that may count for or against the well-being of future persons. This power is active, not passive, and is constantly being exercised: it cannot simply be turned on and off. Further, it is derived from the social networks of which one is part and the technologically-enhanced capacities one has: the degrees of power belonging respectively to a politician, a genotechnologist and an accountant will necessarily differ. But they will all possess some of this power, and will exercise it continually.

This power is the capacity to carry forward one's present commitments, the things one cares about. But this capacity to care interweaves the present with the future. The concept of care expresses the deep connection between human beings and their world, an insight expressed by Heidegger when he defined human being as a fundamental and complex existential attachment to the world, a concern with how our desires and projects can find their place within it.¹² Caring implies concrete individuals essentially *connected* to the world through specific commitments that they want to see bear fruit. By contrast, a rights framework defines agents as abstract individuals, essentially *separated* from the world and each other.

To view humans as motivated by care is to recognise that they cannot live without specific commitments. These commitments are, as political philosophers say, of *constitutive value*. For instance, relationships with other humans weave dense webs of meaning that give our lives weight and texture, and which we strive to sustain in the face of conflict as we grow older.¹³ Other forms of commitment – e.g., to ideals, institutions, or activities – have a similar role. They make our lives meaningful. But the range of our commitments is necessarily always expanding: to care about our loved ones means being committed to how they are looked after when sick, which might lead us to campaign for the public provision of healthcare...and so on.

Commitment therefore entails responsibility in a specific way. Being responsible is not a matter of respecting rigid boundaries between individuals; instead, it means extending one's sphere of action rather than curtailing it, and developing the capacity to sense and respond to what the

¹⁰ Hillel Steiner, "The Rights of Future Generations," in *Energy and the Future*, ed. Douglas MacLean and Peter G. Brown, *Maryland Studies in Public Philosophy* (Totowa, NJ: Rowman and Littlefield, 1983), p. 154; Douglas MacLean, "A Moral Requirement for Energy Policies," in *Energy and the Future*, ed. Douglas MacLean and Peter G. Brown, *Maryland Studies in Public Philosophy* (Totowa, NJ: Rowman and Littlefield, 1983), pp. 183-4.

¹¹ Hans Jonas, *The Imperative of Responsibility* (Chicago; London: University of Chicago Press, 1984), p. 37.

¹² Martin Heidegger, *Being and Time*, trans. John Macquarrie & Edward Robinson (Oxford: Blackwell, 1998), p. 182.

¹³ Daniel Stern, *The Interpersonal World of the Infant* (New York: Basic Books, 1985), chapter 7.

objects of our commitments are counting on us to do.¹⁴ Humans are therefore inherently future-oriented: they always exist 'beyond themselves', projecting their commitments into the future.¹⁵ As such, the future is not just an abstraction: it is always the future of what we care about. It is where our care will be continued, fulfilled, or simply allowed to vanish along with its legacy.

Here, the question 'what has posterity ever done for me?' finds its answer: our commitments need us to care for their flourishing, so that the future can take care of them in turn. For instance, if we are scientists who are committed to the value of quantum physics, then we should take responsibility for ensuring that future generations can understand and appreciate it, and so add to and/or criticise quantum physics as they see fit.¹⁶ In this way, our commitments mesh with the potential of the future, so far as we can envisage it, for caring. Caring calls us to be guardians of cultures who provide for the possibility of their continued flourishing. And this leads to the conclusion that most important is actually to take responsibility for the future of responsibility itself. In the face of the power of technology to impose unforeseen costs and risks on the future, what matters most is that the potential of humans to sustain commitments and to lead meaningful lives be protected and allowed to thrive.

4. Conclusion

In this way, care is more than simply a particular concern for the specific relationships that constitute an immediate milieu in which individuals live: it necessitates the affirmation of a universal principle such as Hans Jonas's injunction that 'never must the existence or the essence of man as a whole be made a stake in the hazards of action'.¹⁷ It therefore creates an entirely new temporal context for ethics, and one that potentially embraces future ecological harms. In place of the claims of the present on the future, it seeks to establish the needs of the future within the present. In the face of the power of technologies such as nuclear energy, it foregrounds a number of issues: firstly, the possibility that precautionary action is required to prevent harms from such technologies; secondly, that the choices made by us must positively contribute to the flourishing of commitments that we would wish to pass on to the future; thirdly, that actions in the present should seek to positively contribute to the capacity of future generations to revise their commitments and to create entirely new ones. The perspective of care thus requires a new public standard of accountability, one based around a vision of the needs of the future rather than rooted in knowledge of the past. The next step in articulating an ethics of care for the future would therefore be to examine how such a vision can be made the object of moral reasoning, and to establish how it could be institutionally supported.

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¹⁴ Carol Gilligan, *In a Different Voice* (Cambridge, Mass.: Harvard University Press, 1982), p. 38.; Stan van Hooft, *Caring: An Essay in the Philosophy of Ethics* (Denver: University of Colorado, 1995).

¹⁵ Heidegger, *Being and Time*, pp. 200-1.

¹⁶ John O'Neill, *Ecology, Policy and Politics* (London; New York: Routledge, 1993), pp. 30-4.

¹⁷ Jonas, *The Imperative of Responsibility*, p. 128.

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