

In Praise of Precipitatory Governance as a (Meta-)Principle of Responsible Innovation

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The most natural way to think about “responsible innovation” is how the European Union and the scholars associated with the *Journal of Responsible Innovation* think about it – namely, in terms of being wise before the fact, when “the fact” consists in suboptimal, if not catastrophic, impacts for a broad range of constituencies in the wake of some proposed innovation. In that case, one tries to anticipate those consequences with an eye to mitigating if not avoiding them altogether. This is normally the territory of the *precautionary principle*, according to which innovations with great capacity for harm – regardless of benefits – would not be introduced at all. “Responsible innovation” tries to take a more moderate line, recognizing the generally beneficial character of innovation but insisting on monitoring its effects as it is unleashed on society and the larger environment. The guiding idea is that one might have one’s cake and eat it: Innovations would be collectively owned to the extent that those potentially on the receiving end would be encouraged from the outset to voice their concerns and even opposition, which will shape the innovation’s subsequent development.

But one needs to be responsible not only before the fact but also after the fact, especially when “the fact” involves suboptimal impacts, including “worst case scenarios”. This is the opposite of anticipatory governance. Call it *precipitatory governance*. Precipitatory governance operates on the assumption that some harm will be done, no matter what course of action is taken, and the task is to derive the most good from it. I say “derive the most good” because I do not wish to limit the range of considerations to the mitigation of harm or even to the compensation for harm, though I have dealt with that matter elsewhere (Fuller and Lipinska 2014: ch. 4). In addition, the prospect of major harm may itself provide an opportunity to develop innovations that would otherwise be seen as unnecessary if not utopian to the continuation of life as it has been.

Here I refer to the signature Cold War way of thinking about these matters, which the RAND Corporation strategist Herman Kahn (1960) dubbed “thinking the unthinkable”. What he had in mind was the aftermath of a thermonuclear war in which, say, 25-50% of the world’s population is wiped out over a relatively short period of time. How do we rebuild humanity under those circumstances? This is not so different from “the worst case scenarios” proposed nowadays, even under conditions of

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severe global warming. Kahn's point was that we need now to come up with the relevant new technologies that would be necessary the day after Doomsday. Kahn believed that this was a politically more tractable strategy than trying actively to prevent Doomsday, say, through unilateral nuclear disarmament.

Indeed, Cold War policymakers did largely follow Kahn's advice. And precisely because Doomsday never happened, we ended up in peacetime with the riches that we have come to associate with Silicon Valley, a major beneficiary of the US federal largesse during the Cold War. The internet was developed as a distributed communication network in case the more centralized telephone system were taken down during a nuclear attack. This sort of "ahead of the curve" thinking is characteristic of military-based innovation generally. Warfare focuses minds on what's dispensable and what's necessary to preserve – and indeed, how to enhance that which is necessary to preserve. It is truly a context in which "necessity is the mother of invention". Most importantly, we win even – and especially – if Doomsday never happen.

The most disruptive innovations in peacetime – such as the automobile or the personal computer – tend to be seen as "necessary" only after the fact, once they have systematically reconfigured the market. Before the fact, they are often seen as speculative, if not risky. Nevertheless they manage to make headway by exploiting vulnerabilities in the market leaders. Historically a major source of those vulnerabilities has been the market leaders' relative lack of resilience to changes in aspects of the environment over which they have little control. This is the spirit in which to get into precipitatory governance.

Thus, one might pose a question of this sort: Suppose the climate science consensus is correct that the Earth's average temperature will rise by at least two degrees Centigrade by the end of this century. Which human groupings, institutions, technologies, and so forth are likely to survive and possibly flourish under these conditions, and which ones not? Those placed in the latter category should be seen as ripe for entrepreneurial investment now – not necessarily to prevent the global temperature rise but to ensure that the most overall benefit is gained from a situation that is both highly likely and *prima facie* suboptimal. The source of that benefit would be the removal of some of the preconditions that had made those now endangered people and practices so adaptive in the past. In effect, the impending catastrophe will have broken what sociologists call "traditions" and economists call "path dependencies", which had made a "business as usual" attitude so attractive for so long.

An interesting economic precedent for this general line of thought is what the mid-twentieth century Harvard economic historian Alexander Gerschenkron (1962) called "the relative advantage of backwardness". His basic idea was that each successive nation can industrialise more quickly by learning from its predecessors without having to follow in their footsteps. The "learning" amounts to innovating more efficient means of achieving and often surpassing the predecessors' level of development. The "advantage" here comes from not having to bear the burden of a particular past, such as the well-documented path to industrialisation taken by England, starting with the Enclosure Acts in the early seventeenth century.

A post-catastrophic humanity would be in a similar position to benefit from this sense of "backwardness" on a global scale vis-à-vis the pre-catastrophic humanity – provided that the record of human knowledge remains relatively intact in the wake of even the greatest catastrophe. This is not a trivial assumption, to be sure, but ongoing projects of digital archiving and curation of everything from artefacts to organisms make it an increasingly plausible one, regardless of one's views on humanity's exposure to "existential risk".

Whenever military history is written with the wisdom of hindsight, precipitatory governance is often implied. Thus, those who like their winners to remain winners and losers to remain losers find it disconcerting to learn, say, how much West Germany and Japan benefitted from having been on the losing end of the Second World War, such that by the 1960s they were global socio-economic trend-setters. Nevertheless, once time has healed enough wounds, such a turn of events is generally seen as having been a good thing, even if the conditions precipitating them were not.

Moreover, the increasing economic rationalization of warfare, starting with the Second World War, has shifted the horizon of precipitatory governance from hindsight to foresight. Indeed, our times have witnessed the rise of private and corporate investors on the lookout to capitalize on major catastrophes, natural or human in origin. An exemplar of this tendency is the Halliburton Company, which specializes in infrastructure projects in oil-rich regions of the world, places in periodic need of reconstruction due to their susceptibility to military conflict. One can decry Halliburton's sweetheart deals and adventurism, yet admit that in their self-serving way they are in the business of precipitatory governance.

Behind this relatively sanguine attitude towards the potential benefits of catastrophe is a controversial idea, namely, that the competences associated with creation and destruction are fundamentally similar, or in Stalin's homely quip, "You can't make an omelette without breaking some eggs". In both cases, there are two key elements in the application of force: concentration of resources and strategic focus. Of course, destruction is potentially "creative" only to those empowered in its wake. But this may simply reflect an ability or willingness to see deeper benefit in apparent harm, perhaps by expanding one's spatio-temporal horizon. The ethical and political challenge facing the advocate of precipitatory governance is to make credible this intuition – which comes perilously close to reducing material harm to a failure of imagination. I have discussed this challenge in terms of *moral entrepreneurship* (Fuller 2011 : ch. 5, Fuller 2012 : ch. 4).

Let me stress that precipitatory governance constitutes "responsible innovation" in quite a deep sense, albeit one relatively ignored in the literature. It is natural to hear in the phrase "responsible innovation" the idea that innovation might be irresponsibly undertaken, which in turn is something that should be avoided. However, I hear something different, namely, that innovation is inevitable and that the challenge is to extend range of "responsibility" throughout the entire innovation process. More to the point: Insofar as innovation itself is seen as central to the promotion of the human condition, then it would be irresponsible *not* to provide for the promotion of innovation even in light of cases where particular innovations have led to catastrophic outcomes. In effect, precipitatory governance is an insurance policy against any anti-innovation backlash in the wake of a major catastrophe.

Precipitatory governance is ultimately underwritten by the *proactionary principle*, the opposite of the precautionary principle (Fuller and Lipinska 2014 : ch. 1). Put crudely: If the precautionary principle commands "Do no harm!", the proactionary principle commands "No pain, no gain!" More precisely, the two principles approach risk from opposing angles: the former risk-averse, the latter risk-seeking. Whereas the precautionary treats an uncertain future as a potential threat, the proactionary sees in it potential opportunities. To be sure, over the past decade, the two positions have developed in relation to each other to such an extent that some have questioned whether they should be seen as absolute opposites (Holbrook and Briggles 2014). I continue to do so for purposes of normative clarity.

My guide here is Jean-Paul Sartre, who argued that we all have "dirty hands" regardless of whether our actions are seen as having caused a net harm or a net benefit to the world. Even the most

precautionary policies that aim to lower the level of risk in the environment – say, by prohibiting genetically modified organisms or lowering carbon emissions – incur opportunity costs with regard to the development of science and technology, which also need to be put on humanity’s balance sheet when assessing the prospect of future generations. After all, the harm “prevented” by having taken certain courses of action (e.g. to lower environmental risk) and the harm “caused” by not having taken certain courses of action (e.g. to promote science and technology) are equally speculative, by virtue of their reliance on counterfactuals. Nevertheless, we tend to accord greater realism to the former sort of counterfactual, perhaps due to its tie-in to action explicitly taken in this world. Generally speaking, such intuitive asymmetry has favoured the precautionary principle. However, the law is sensitive to the cognitive bias involved here, which it tries to redress by devoting considerable attention to culpability through negligence.

To be sure, precipitatory governance appeals to a broader conception of negligence than is normally entertained in the law. Specifically, it includes neglecting to promote the innovative capacity of human beings. This idea is not entirely without precedent in the law. One thinks of the original justifications for patents and copyrights in the early modern period (Fuller 2002 : ch. 2). However, what gives precipitatory governance its distinctly proactionary spin is a shift in the modal standing of innovation: from something permitted (perhaps incentivized) to something obligated. Again, this shift is not without precedent. Consider policies that aim to provide “equal opportunities” for each successive generation, which the United Negro College Fund memorialized in its 1971 ad campaign as “A mind is a terrible thing to waste”, implying that a young mind will be wasted unless actively cultivated. Thus, a generation that might be otherwise left behind is given a “head start” by providing them with skills for a future whose uncertainty is interpreted as potentially a level playing field, in which default forms of advantage (and disadvantage) need no longer be in effect. This is, of course, a more recognizably “progressive” route to reach largely the same state of mind into which Herman Kahn frightened Cold Warriors, in which “ground zero” creates the level playing field. In both cases, the concern is not simply our responsibility *for* innovation but *to* it.

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