Book Review: Democratizing Technology

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Review of *Democratizing Technology: Risk, Responsibility, and the Regulation of Chemicals* by Anne Chapman (Earthscan Publications, 2007). ISBN 978-1844074211. $99, Hardcover.

In *Democratizing Technology*, philosopher Anne Chapman, adds a new, and ultimately policy-focused perspective to the discussion of risk, using the arena of synthetic chemicals as her technology of focus. Her project is to expand the concept of risk beyond the economic frame of "risk assessment" toward understanding risk within the larger arena of the public sphere and public policy. She chooses synthetic chemicals, to use as the main case study in her book because, throughout the decades of their production, new and unexpected problems arise on a regular basis. Additionally, chemical regulation and policy is exemplary of two aspects that she finds problematic: a science-based approach to risk and a largely economic argument for their production.

Initially, she examines the philosophical and theoretical underpinnings of the current approach to risk, in order to illuminate assumptions embedded therein. In her careful step-by-step analysis, Chapman defines terms as she goes, beginning with "technology" itself. Technology is "'world-building': it is both how we add material things to the world and the things that we have added to the world that we use."(2) She argues that instead of using "economic prosperity" as the government's reasoning for promoting technological innovation, the real responsibility of government is for the shared, public world. One of the key concerns presented is that risk and its embedded reliance on economic indicators is not the standard by which technologies should be assessed for regulatory purposes. Instead, Chapman argues, we should consider the *riskiness* of a technology. In other words, the standard that governments use to assess technologies should consider not only the probability of harm, but also: 1) how extensive are the unknowns with the given technology, 2) is the thing put at risk of great value, and 3) are the consequences of a harmful event irreversible?

Her thinking draws primarily from the work of two scholars in political philosophy and the philosophy of science. First, she presents the work of Hannah Arendt, as it pertains to responsibility for shaping our shared environment and extrapolates on this by proposing regulatory possibilities. She states: "It is in the work of Hannah Arendt that I have found a political philosophy adequate to the task of thinking about technology . . .[as she] emphasized the publicness of the world." (6, 26) Second, she uses the work of Nancy Cartwright and the "Stanford School" to explain science and science-making. Science is not a unitary discipline but many types of science, sharing a systematic, empirical method but not a single view of reality. (44) This pluralist view of science leads Chapman to maintain that:

> "Each science has its own relationship with technology. Some sciences lead to new technological developments, some reveal the effects of technology on natural systems and are important in the regulation and control of technology, while others simply give us a better understanding of the world." (44)

While her interdisciplinary interweaving of the work of Arendt and Cartwright is innovative, she makes, in my opinion, another, more illuminating, and potentially controversial observation in Chapter 4. The problem motivating this move is that sociologists of science and technology often do not differentiate between science and technology and instead focus on "practices" while ignoring other substantive aspects. While agreeing that, in Arentian terms, both are world-making processes that add knowledge and material objects to the planet, they are fundamentally two different types of things. Science and technology "answer to different norms and we use different criteria when judging them: how we judge whether or not the outcome of a scientific investigation should be added to our stock of knowledge about the world is quite different from how we judge a material object." (47) The former is examined for the link between evidence and conclusions, while with the latter, evidence is only important for non-obvious facts about the technology (i.e. toxicity). Other questions and norms are applied to technology such as: is it useful, is it ugly or beautiful, or how does it impact social relations? These are answered by opinions which are matters of reasoning, not evidence, in the case of matters of fact. Because of this, the activities that regulate them should be distinguished, and technological regulation should be primarily in the domain of democratic control.

Because there are significant differences between science and technology, and that science is used as the model for the regulatory structure, it is inadequate and inappropriate for the regulation of technology. While there have been changes in the UK to allow more citizen input "in the debate about risks from new technologies . . .the subject matter of the debate is considered to be science, not technology." (39) The US also uses a science-based approach to restrict technologies such as those of chemical production. Similar to the UK, this means that science-based proof-of-harm must be evident for action to be taken. Thus the criteria of science, and not technology, form the basis of regulation.

Chapman next examines three assumptions behind government technology policies: 1) science leads to technological innovation; 2) technological innovation is positive for the public and the economy; and 3) public input about risk of new technologies is via consumer choice and thus the regulatory body's role is to provide consumer information. In the case of technology innovation and regulation, the argument for economic growth often takes precedence over other concerns. While 'growth' is a positive and natural biological term, it fails to capture the essence of technology, a human-made phenomenon. In addition, the word 'consumer' also fails to capture the essence of how we use technology. It implies total consumption of the artifact, but the reality is that many artifacts (cars, carpets, chemicals, etc.) are not fully consumed but end up as waste products and/or pollution degrading the environment. She points to Arendt's distinction between activities of labor and work where the first is "to provide for our needs as living organisms" and the other is to make "products that form part of the world." (51) These two activities can and often do coincide but the moral responsibility for the shared world that Arendt so eloquently advocated, is often absent. Extrapolating from Arendt, Chapman argues that democratic regulatory systems should engender moral responsibility for the shared environment—they should hold a "better world" for citizens as their goal, not the economy, as the sole criterion.

There are many problems with the various concepts of risk, which she carefully chronicles in Chapter 6. The most prevalent form of risk used for technological regulation is based on what is known or what is probable. From a basic science perspective, there is always a degree of uncertainty which can be translated to unknowns. Often the regulatory body, treating technology as a science, concludes that it is safe until more is known for sure. She suggests that technologies, such as chemicals, should be held to a standard that takes into account the norms of technology, not science. In advocating for the criteria of *riskiness* rather than risk, in

technological assessment, the author states: "Whereas risk relates to outcomes, riskiness is a property of a thing, situation or activity and is relative to our knowledge about it." (112)

In Chapter 8 she examines the political and ethical framework of policy and regulation, countering the assumption of utilitarianism at the heart of cost-benefit analysis (typically used to limit regulation). Using Nancy Cartwright's concept of *nomological machines*, she argues:

> " regulations are part of an ordered framework in which the causes of economic activities have effects. Rather than asking what the costs and benefits of a regulation will be, we should ask how the regulation will change the effects that the causes of economic activities have. . . The questions we should ask is how changes to the world will change what the interests of individuals are [because] what is in the interests of the world cannot be derived from consideration of the interests of individuals." (117, 124)

Her concern is how regulatory regime changes affect the impact of economic activities? And how can we put the shared world and its citizens as the locus of policy action rather than the individual, conceived of in current practices as either a person or corporate entity?

The conclusion of the book, in Chapter 10, sets forth a possible solution drawing from the discipline of architecture and planning. Reminding us that her definition of technology is "world-building"--the things we add to the world and how we add them-- she concludes that the domain of making buildings and shaping environments is a more suitable model from which to draw on for policy purposes than science. Because synthetic chemicals are materials that are not found in nature, but are "things" added to the world, they are a technology, more akin to buildings and their arrangements than to scientific knowledge. Urban and regional planning can include a networks of public agencies, private and public interests as well as non-governmental organizations negotiating either explicitly or implicitly in shaping the public realm. On a micro-level, building codes are also negotiated, adopted, and developed over time, with input from experts, insurance companies, and public interests. They not only include the utilitarian perspective or private property viewpoint but also, more expansively, they consider the shared environment which is of public concern.

Advocating this approach, Chapman concludes:

> "Like public controls over built development, I suggest that public controls over technology should consist of two types of systems: technical standards, equivalent to building regulations, and a system equivalent to the planning system that can take into account matters that are not easily quantified and measured." (158)

Having taught and practiced in the field of architectural technology for 20 years before moving into the field of Science and Technology Studies, I had some reservations about her conclusion. The real word of land use planning is fraught with special interests wielding uneven power, made evident by the environmental justice movement of the past decades. Building codes, while laudable for their protection of public safety, can also be frustrating and limiting to those wanting to use innovative green technologies and designs. That said, though imperfect, this may be the best model for a regulatory system with regard to governing technologies in the public realm today.