Book Review Essay

Innovation's fairylands

Benoit Godin, *Innovation contested: The idea of innovation over the centuries*, Routledge: New York, 2015; 354 pp.; ISBN 9780415727204, $155.00 (hbk)

Benoit Godin, *Models of innovation: The history of an idea*, The MIT Press: Cambridge, MA, 2017; 344 pp.; ISBN 9780262035897, $37.00 (hbk)

Molly Wright Steenson, *Architectural intelligence: How designers and architects created the digital landscape*, The MIT Press: Cambridge, MA, 2018; 328 pp.; ISBN 9780262037068, $34.95 (hbk)

Allison Isenberg, *Designing San Francisco: Art, land, and urban renewal in the city by the Bay*, Princeton University Press: Princeton, NJ, 2017; 432 pp.; ISBN 9780691172545, $37.50 (hbk)

Christo Sims, *Disruptive fixation: School reform and the pitfalls of techno-idealism*, Princeton University Press: Princeton, NJ, 2017, 232 pp., ISBN 9780691163987, $27.95

Reviewed by: Molly Sauter, *McGill University*

In one of those *this-is-water* intellectual blindspots, it is both surprising and completely expected that we should have had to wait until the mid-2010s for a thorough, critical history of the concept of "innovation" to be published. Innovation has been an infrastructural substrate of the modern Western economy, reshaping fundamentals of society with a speed and effectiveness that is frankly shocking. How did we get here? Innovation scholars, it appears, have been happy to one-up each other in the theory-making game, laying out new optimistic rules for what might be called *How Should an Innovation Be*, but an exploration of how the cargo cult of innovation *came to be* has been missing until now. Benoit Godin, a Professor at the Institut national de la recherches scientifique in Montreal, Quebec, has led the "Science, Technology, and Innovation: Intellectual and conceptual histories" project since the early 2000s. In 2015, he published an English-language collection of his papers as *Innovation Contested: The Idea of Innovation Over the Centuries*. This work traces the intellectual history of the concept of innovation, reaching as far back as the ancient Greek word *kainotomia*, meaning "cutting fresh into; cutting new mines" (p. 19). As this temporal breadth might suggest Godin is interested in the study of innovation as a "synthetic concept" that evolves over a literal millennia across multiple fields: ancient

engineering, religion, sociology, history, and management. Godin is specifically interested in the ways "innovation" spurs action: "[C]oncepts and actions go together. Concepts are an integral part of an event, a crucial ingredient of its happening. They give significance to events and articulate new possibilities" (p. 3). While the focus of "innovation studies" has heretofore been what we could messily call *those objects and ideas that we call innovative*, Godin is more concerned with "representations of innovation … look[ing] at innovation as a cultural force … examining why people make use of the concept and what impact they have on social, political, and economic thought" (p. 3).

Godin identifies three "Epistemes" of innovation: prohibition ("from the Reformation to the 19th century, as a moment when innovation is strictly forbidden by law and is a word of accusation by critics" [p. 8]), instrument ("19th and 20th centuries … Innovation has become a noncontroversial practice, an institutionalized signifier and an ordering and structuring principle of thought and action [p. 8]), and value ("The current moment" [p. 8]). Although he reaches past these broad divisions somewhat, most notably to explore the use of pre-cursor terms in the Ancient Greek and Roman worlds, these temporal delineation guide the organization of this text. Happily, each of the individual sections stands strongly on its own. It is not necessary to read up on *kainotomia* and *innovo* if the reader's interests lie primarily in innovation in the 1800s and beyond, though the early histories presented are fascinating in their own right.

Refreshingly, Godin does not shy away from invoking the political work done by the innovation concept, either in the past or in the modern context. He explicitly notes innovation's modern incarnation as a future-focused ideology, one that the field of "innovation studies" has optimized for easy deployment in the policy sphere. This idea is given explicit weight in Godin's more recent book, discussed below. Pulling no punches, Godin describes innovation's "current moment" as,

> That moment when innovation becomes a value per se. Innovation has become part of a verbal arsenal of honor and praise. It is the object of veneration and cult worship. At this moment, the concept of innovation loses some of its descriptive function. Today, innovation means anything, everything … and nothing. Innovation is an umbrella term, a concept that groups a diversity of things, activities and attitudes that serves, more often than not, the practical (technology and the market). If I may paraphrase Koselleck on revolution again, innovation "possesses such [innovative] power that it is constantly extending itself." Innovation has become a panacea for every socioeconomic problem. (p. 8)

Godin's analyses in *Innovation Contested* are, in the modern era, restricted to the Western French and English-speaking world, and he does not extend his focus beyond fairly narrow invocations of "innovation" proper. Those interested in the use of innovation as a concept in, say, India or China, or the expansion of the innovation concept into projects like "design thinking" would be best served by looking to the work of Lilli Irani, Dagmar Schäfer, or Lee Vinsel.

Godin's more recent text, *Models of Innovation: The History of an Idea*, published in 2017 by MIT Press, is less about innovation per se and more about the organizational concept of *the model*, its intellectual and rhetorical value, and how it has been coupled with "innovation" throughout the 20th and 21st centuries, much to the benefit of the latter concept.

Godin describes a "model" as "a conceptualization, including narratives, a set of conceptualizations, or a paradigmatic perspective, often put in a pictorial form—but reduced discursively to a simplification of reality" (p. 12). The rhetorical function of the model is twofold: "First, model is a symbol of 'scientificity'. Second, a model travels easily between scholars and between scholars and policy makers. Calling a conceptualization or narrative or perspective a model facilitates its propagation" (p. 12). Godin is particularly interested in the use of models to legitimize the field of "innovation studies," which he identifies as a field primarily concerned with policy-making. "Scholars got a hearing because their models addressed policy issues directly. Sociologists, economists, and scholars from management schools and public policy started modeling innovation and technological innovation as explicit contributions to policy … " (see pp. 220–221).

Godin identifies the work of the model as an intellectual formation as central to the influence of "innovation" and the ideology it transports. The model bundles value-making, story-telling, and an instruction manual into a readily disseminated package: "Models" valorize concepts and narratives, creating from them attractive bundles of cause and effect, along with direct or implied instructions to "[direct] change and action." It helps "proper ordering of the efforts" (Lionberger), "reducing the gap between experimentation and adoption" (Beal and Bohlen), "speeding up the process of innovation" (Rogers, Wilkening). A model is a "powerful synthesizing mechanism" for "'controlling' innovation (Mottur)" (pp. 219–220).

Observers of the innovation space will note here a curious elision in the text, as Godin does not spend much attention at all on the managerial innovation consultants who flourished during the dotcom boom and who continue to do so now under various guises. This is primarily due to Godin's focus on "innovation studies" as a linking field between scholars of innovation at business schools and policy makers, primarily in the US federal government, and is also an effect of the time periods covered in *Models*. The text does not reach much beyond the 1990s. Godin spends significant energies establishing the influence of Rupert Maclaurin, an MIT technocrat Godin credits with shaping the direction of innovation studies, and thus US innovation policy, from the 1950s onward. Maclaurin's contributions were certainly influential and Godin should be credited with bringing the work of this forgotten figure back into the light. But not acknowledging the "consultants phase," as it were, of innovation, means that *Models* seem to end prematurely.

Godin's historical work in *Innovation Contested* and his more theoretical work in *Models* are both valuable contributions to the study of innovation, a field that he correctly points out has been, until recently, dominated by work that aims more to advance the ideology of innovation rather than interrogate and critique that ideology itself. *Models* in particular gives much needed consideration to the intellectual forms the innovation discourse has assumed, and provides a clear and compelling theory of how those forms have impacted the broader world's reception of the ideology of innovation and the development of "innovation studies" as an academic, technocratic field.

Molly Wright Steenson's new book, *Architectural Intelligence: How Designers and Architects Created the Digital Landscape*, out in 2018 also from MIT Press, picks up the concept of the model from a different angle. Wright Steenson is focused on the influence of architects and the discipline of architecture on the design of computers and networks. She highlights the work of four individuals: Christopher Alexander (architect and

originator of "pattern languages"); Richard Saul Wurman (information architecture and TED conference founder); Cedric Price (architect and designer of cybernetic buildings); Nicholas Negroponte (trained architect, founder of the Architecture Machine Group and the MIT Media Lab). All trained as architects, but their buildings (if they produced any) were not what made them famous or relevant to Wright Steenson's study. She acknowledges early in the text "none of the projects in this book by any of the architects I write about directly resulted in constructed buildings" (p. 3). Christopher Alexander is primarily known for his work on pattern languages, a concept that jumped from experimental city planning into computer programming. Wurman founded the TED Conference, generator of those flashy mini lectures that irrepressibly reduce worldly complexities to the length of a neoliberal lunch break. Negroponte founded a string of working groups at MIT, which ultimately culminated in the founding of the MIT Media Lab in 1985. Cedric Price designed a veritable flock of cybernetically enhanced buildings in the 1960s through 1980s, none of which were ever actually constructed, but whose influence has reached as far as modern smart city design and AI projects.

The point of interest for Wright Steenson is, as it is for Godin's later text, the *model*, a thing "both like and unlike the architectural object to which [it] relate[s]" (p. 7). Wright Steenson sees the value of the model as distinct from the physical buildings (if any) it might precede "Models serve as the measure of an idea, the working through an image in one's mind, into a drawing and into three dimensions" (p. 7). Her work highlights the codependencies between two different structures for the support of modern, Western life: the structuring of buildings and the structuring of information. The value here is not the buildings that never came into being, but rather the after-lives of models and proposals, living on as theories guiding the structuring of information, of socializing, and of design.

In this sense, the most "successful" deployment of models in Wright Steenson's narrative arrives toward the end of her text. In describing the "demo culture" of the MIT Media Lab and its predecessors, Wright Steenson highlights "microworlds," self-contained, sandboxed computing environments that served as the operating environment for experimental programs, proof-of-concepts, and early AI systems. "Microworlds were a useful construct precisely because they operated without regard to reality, contrary as it might seem, 'partial, internally consistent but externally incomplete domains' as Paul Edwards described them in THE CLOSED WORLDS" (pp. 177–179). By simplifying the external world, microworlds enabled demo culture to exist by, in a very real way, creating the conditions for the technology itself to function. Microworlds allowed researchers to "isolate certain variables within a program and abstract aspects of a design problem 'without irrelevant or unwanted complexity'" (p. 177). Microworlds, and the technologies that lived within them, were not intended to grasp the complexities of reality, and similarly, the layworld was not intended as an audience of these demonstrations, because they were not ready for broad deployment. The esoteric, embryotic isolation of microworlds was a feature, not a bug.

AI pioneers Marvin Minsky and Seymour Papert seem to have grasped the practical limitations of microworld development practices, calling them "a fairyland in which things are so simplified that almost every statement about them would be literally false if asserted about the real world" (quoted in WS, p. 193). Microworlds were development tools, both for technology and for ideas about technology. But Wright Steenson

points out that this sense of techno-philosophical restraint was quickly lost within the Negroponte fiefdom:

> The problem with AGM's [Architecture Machine Group] microworld models is that they *did* apply to the real world. Negroponte did not intend for his ideas of dialogue and self-reflexive modeling to remain in the lab. The area of inquiry was still architectural, engaged with problems of designing for the built environment. (p. 193)

Demos at the MIT Media Lab and its Negroponte-led precursors like the Architecture Machine Group were (and still are) understood as objects of salesmanship:

> [T]he visual and conversational interface garnered attention for this project—even as commands for a simulated robot on a screen. "The fact that you could talk about something you could actually see was an important thing for getting people to pay attention to it," [AI theorist and AMG graduate Terry Winograd] said. Microworlds made for good demos, and Winograd and Negroponte both knew that a project with a good demo was an attractive project to fund. (p. 184)

The point that models serve as rhetorical objects intended to sell real projects, smooth over objections, and inspire optimism is similarly made in Allison Isenberg's *Designing San Francisco: Art, Land, and Urban Renewal in the City by the Bay*, out in 2017 from Princeton University Press. Isenberg notes that in the 1950s and 1960s, the arrival of public "urban renewal" projects drove a rise in the demand for architectural models and renderings "in order to explain proposals to the average citizen. So did the skyscrapers and ever-bulkier private commercial developments that depended on public approvals such as zoning variances and street closings." These models featured clean lines, pleasant colors, and were ideal instantiations of ideal buildings, created by skilled artisans and professionals. They were not merely slavish recreations of architectural designs. Isenberg quotes Gerald Ratto, a photographer who worked with architectural model builders in San Francisco throughout the crucial mid-century decades when the city's waterfront was almost completely redeveloped: "Model-making is not making a miniature of something. Model-making is more an interpretation or an expression of the building" (p. 237). Truly they could be no other way for, as Isenberg points out, "[t]he obsessively 'realistic' models, after all, described imaginary places" (p. 238).

Because these models preceded physical buildings, they were active participants in fights over the future of San Francisco, literally embodying arguments over the built environment. Isenberg observes,

> Models were the leading edge for introducing new planning and architectural concepts to the public and for provoking reaction to design. The models were used to promote, of course, but they were also used to negotiate deals and compromises amid protests over the scale of redevelopment. The scale models sat, not always inertly, at the center of controversies over these issues. For city projects, models had to address the relationship between new construction and historical context. Should the model designer exclude adjacent blocks given that they were slated for clearance? Or should the model demonstrate a sensitive relationship between a modern office building and the neighboring older downtown streets? Models engaged the debates over whether buildings would divide neighborhoods or block views and whether proposed projects were outsized, too tall, too dark, or too light. (p. 241)

Ultimately, the architectural model, though it can be a beautiful and compelling object serving a rhetorical purpose, does not exist to its own ends. In the end, hopefully, with any luck, a building will be constructed that must yield to the messiness of the physical, urban environment: the planning and permitting process, the construction process, and the grubby experience of physical structure co-existing with human in the world. Intellectual models, as Godin describes, and computational models, as Wright Steenson describes, however, potentially never reach that point. The friction between the model and reality may never become undeniable. The model may never burn away.

Christo Sims observed this in his recent text, *Disruptive Fixation: School Reform and the Pitfalls of Techno-Idealism*, published by Princeton University Press in 2017. Sims notes how innovation-tagged projects, ones that hold their "innovative" and "disruptive" natures as points of pride and political strengths, failure-proof themselves. The repeated failures of innovative reform projects led by specific individuals or organizations, following ideologies of techno-assisted reform, often have the perverse effect of solidifying reputations for expertise:

> Taken together, the recurring failures of techno-philanthropism ironically help to maintain, and even expand, the industries, research programs, media professionals, and investment opportunities of parties that specialize in diagnosing societal ailments, and prescribing seemingly innovative new fixes.… Cumulatively, cycles of failed intervention not only perpetuate the worlds and industries of reformers, they also extend the reach of those who can profess expertise in these domains as well as the modes of governing that these experts, perhaps inadvertently, help install. (p. 166–168)

Godin and Wright Steenson have similarly noted that if the goal of a given project is to perform "innovation," then the mere declaration of "innovativeness," which Godin identifies as a "magic word," is often enough to satisfy observers, be they policy makers, granters, clients, or media, regardless of outcome.

This pattern, where failure results in more funding, more chances, is familiar from the tech world that brought us such gems as the over-funded Juicero and the med-tech-unicorn-turned-felonious-liability Theranos. It indicates that certain models, particularly those that trade in the mandatory future-facing idealism of the innovation ideology, whether they be physical models, intellectual figurations, or simplified computer simulations, recursively set the conditions for their own success. As these models are transmitted into the world whole with their fairylands, it is easy to arrive at the judgement that the models are not failing reality, but reality that is failing the model. Despite the scientization of the model format, Godin notes that innovation is still an unfalsifiable idealization, a rendering of utopianisn masquerading as a set of Euclidean proofs.

These models of various stripes facilitate the flows of narratives, ideas, materials, power, and capital. Like Isenberg's architectural models and illustrations, selling a new vision of San Francisco's waterfront, the animated, interactive demos of Negroponte's Architecture Machine Group illustrate a potential future. Like Godin's models of innovation, they describe a path to a techno-utopia. And like each of these models, these microworlds are exercises in persuasive simplification.

A charismatic model is often more than a proof of concept. While the AMG demos were built inside carefully pruned microworlds, as rhetorical objects they were selling an

idea of the future, a vision that relied on the technology on display and ideas about what it could do. To invest in these programs meant buying into not only the world that that technology promised to bring into existence but also the highly restricted world that the technology required to exist in the first place. The AMG and later the Media Lab bet hard on AI projects that were intended to perceive and organize complex systems for human operators, and were often explicitly or implicitly intended for military deployment. The simplicity of the microworlds underscored the black and white nature of the militaristic endeavor, a mirroring reinforced by the particularities of the AMG's funding practices.

Like many groups at the MIT Media Lab today, the AMG was funded through direct contacts with corporations, the US Department of Defense, and military contractors. This type of funding structure favored personal relationships that developed over time and were often reliant on MIT's old boy network. Wright Steenson quotes Marvin Minsky telling Steward Brand that the DoD research offices trusted MIT labs "because they were us. For fifteen years the [ARPA] office down there was run by an ex-MIT person or equivalent. It was like having a patron" (p. 191). Negroponte similarly says "There was DoD funding but it was through a real personality of someone [Marvin Denicoff of the Office of Naval Research] who was betting on us as people, not the ideas" (p. 191).

This style of funding resulted in another type of microworld, where relationships between funders and researchers were isolated from competition and built over time. The likelihood of a project getting funded at the Office of Naval Research or by DARPA in the 1970s was more likely to be the result of who the researchers knew, or the connections of their lab, than any specific merits of their proposal. Negroponte explained his preference for the personal-relationship–dependent Department of Defense funding model to Wright Steenson this way:

> [National Science Foundation funding] is a beauty contest [where] you go through peer review and at the end of the conference you have no history, you start all over again. [The Office of Naval Research], you build up their confidence, they fund you because they trust you, they believe in you. So the DARPA funding, the DoD in general, was much better. I hated the NSF. (p. 194)

This closed funding world created what was essentially a feedback loop of specialization, as microworlds and the hothouse technologies they were created to foster became more and more specialized to the needs of a specific population of funders.

Models can remain influential long after anyone has ceased to advocate for them. Just like the bones of a building remain, despite the layers of renos and refurbs, the narratives, embodiments, and sandboxes of technology and business and how should a society be reverberate long past their peaks of fashion. Godin, Wright Steenson, and Isenberg all present us with strong analyses of how the dollhouse manifestations of structures, ideas, and skyscrapers, built or unbuilt, enacted or literally left on the drawing board, can appear in the physical world. Each of these texts presents a theory of how, like a backward Dorian Grey, the model can shape reality.