

Two-Dimensional Science

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French philosopher Jean Baudrillard has given us the simulacrum as one of the defining characteristics of (post)modern society. A simulacrum is a representation that has completely displaced the original it is meant to represent; it has come to seem much more real than its underlying reality (1). Christopher Frayling's *Mad, Bad and Dangerous?*—according to the author, the first full-length book to tackle the portrayal of the scientist in popular culture—neatly reflects Baudrillard's conception. Frayling argues that the current popular image of science and the scientist is almost entirely defined by the cinema and other mass media. The power of cinematic images to penetrate the collective psyche, coupled with the fact that scientists have generally been unwilling and/or unable to compete with convincing narratives of their own (culture, like nature, abhors a vacuum), has brought us to the point where “the public's view of science is shaped more by film and television and newspaper headlines than by anything else.”

Of course, the relation between the cinema and science is not a new topic: it has provided material for a vast number of essays and books over the years (2). But Frayling's take is a little different. Based on his examination of science-themed movies, from *Metropolis* to *The Matrix*, along with the strong similarities in how schoolchildren describe and portray scientists in surveys carried out from 1957 to 2003, he claims that iconic images of the scientist in cinema have become “part of the cultural drinking water.” In particular, key features have survived more or less unchanged. Even though the dominant paradigm of the cinematic scientist has evolved considerably through the 20th century, the same conventional stereotypes are found in a wide variety of genres. From tales of mad scientists such as Henry Frankenstein and his suc-

cessors, to the hagiographic “bio-pics” of famous scientists (such as Louis Pasteur, Paul Ehrlich, Alexander Graham Bell, Thomas Edison, and Marie Curie) popular in the late 1930s and 1940s, the scientist is shown as a misfit, single-mindedly focused on his (sometimes, but rarely, her) work, and isolated from society in general and from the scientific establishment in particular. As Frayling concludes, “[T]he mad scientist and the saintly one are in some ways two sides of the same Hollywood coin.”

Frayling's basic contention, that cinematic images have remarkable staying power, certainly rings true. Anyone would instantly recognize Boris Karloff as Frankenstein's monster from the 1931 James Whale version. Another of his examples will be familiar to readers of a certain generation: the illustration of a nuclear chain reaction by way of a table covered with ping pong ball-loaded

**Mad, Bad and Dangerous?
The Scientist and the Cinema**
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The archetypal mad scientist. Dr. Henry Frankenstein (Colin Clive) and his assistant Fritz (Dwight Frye) prepare to bring the monster to life in James Whale's 1931 film.

mousetraps in Walt Disney's *Our Friend the Atom*, which I haven't seen for nearly 50 years but still remember vividly. On a more detailed level, his arguments might have been made a little more convincing. The thematic organization of his film survey sometimes seems arbitrary and forced; also he goes a little too far in trying to separate popular from literary culture. After all, many of the films he considers have origins in “highbrow” literature. Indeed, the very title of the book has neither scientific nor cinematic ancestry—“mad, bad

and dangerous to know” comes from a description of Byron by one of his (female) acquaintances.

I have a couple more quibbles: There is very little real science in the book, and what is presented is often a little bit off. (For example, the author claims that Einstein's 1905 paper on special relativity was experimentally confirmed in 1919, but Arthur Eddington's 1919 solar eclipse observations were taken as confirmation of the theory of general relativity; similarly, the main components of the Strategic Defense Initiative are identified as “heat-seeking lasers.”) Furthermore, the generally lively and entertaining writing style is periodically marred by interminable run-on sentences that cry out for the intervention of a more assertive copy editor.

But these are not major shortcomings, because Frayling gives us valuable insights about a very real problem. He also offers suggestions for corrective action, although he does not appear to be very sanguine about the likelihood of success. As he repeatedly points out, positive and/or realistic portrayals of scientific practice may be hard to reconcile with the demands of effective dramatic representation. He cites an early example, H. G. Wells's *Things to Come* (1936). Produced as deliberate counterpoint to the dystopian *Metropolis* (1927), this utopian futuristic movie was, unlike Fritz Lang's classic, a total flop. On the other hand, Frayling has not paid much attention to the recent diversification and fragmentation of popular culture. As public reliance on mainstream cinema and network television is increasingly supplanted by hundreds of satellite and cable channels and the Internet, new opportunities for loosening the decades-long hold of the stereotypical scientific image might well open up.

Lastly, I would carry Frayling's concerns even further on one point. If he is correct that the representation of the scientist as anti-establishment outsider is deeply embedded in public opinion, might not that perception contribute to explaining why scientists who adopt heterodox positions—in arenas ranging from global warming to intelligent design—seem to command so much attention in the United States (3)? Frayling (who is English) draws no such conclusion; on the contrary, he quotes one commentator: “All these debates about ‘creation science’ versus ‘Darwin’ are almost beside the point. The real creation myth of modern times is not Darwin, not Genesis; it is *Frankenstein*.” Maybe so, but on this side

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of the Atlantic, it certainly doesn't look that way right now.

References and Notes

1. J. Baudrillard, in *Jean Baudrillard: Selected Writings*, M. Poster, Ed. (Stanford Univ. Press, Stanford, CA, 1988), pp. 166–184; also available at www.egs.edu/faculty/baudrillard/baudrillard-simulacra-and-simulations.html.
2. For example, the Society for Literature, Science, and the Arts, an organization focused on the social and cultural dimensions of science and technology, invariably has several sessions on science and film at its annual conferences. Recent programs can be found at www.litsci.org.
3. See C. Mooney, *The Republican War on Science* (Basic, New York, 2005). Reviewed by N. Oreskes, *Science* **309**, 56 (7 October 2005).

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ENVIRONMENT

Learning to Say "Enough"

Norman Myers

We live in societies where there is never enough and never too much. At the same time we hear endlessly about our overuse of environmental resources, and there is an emerging consensus that we need to do something. Alas, we hear little in pragmatic, everyday terms about what that "something" could be. Instead, we hear vague admonitions to buy green, to be less greedy, and to think long term, among other well-intended practices. Sometimes these exhortations extend to appeals to political leaders to lead by, for instance, making prices reflect all externality costs.

Plainly, such simple urgings are not getting us very far. We need to learn more about the hows of changing people's behavior and then formulating a changed-consumption world. In short, we need to gain a better understanding of the kinds of social

organization that will lead us toward the promised land of sustainability. In turn, this means developing new principles to reflect the radical changes ahead.

Such is the message of Tom Princen's *The Logic of Sufficiency*, an admirable and timely book. Princen, a sociologist at the University of Michigan, has long pondered the norms of sustainable consumption, especially when grounded in moderation, restraint, and thrift. He postulates a principle of consumption sufficiency, which he

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believes can reach beyond the oft-urged goal of resource efficiency. Efficient consumption of resources is still consumption. If 100-miles-per-gallon cars enable consumers to save sufficient money to buy more of this and that, the efficiency increases consumption and only postpones the day when we consume less while enjoying greater material well-being. To paraphrase Al Gore, we need life-styles that are not just better off but better.

Princen starts by reviewing the concept of sufficiency, especially the imperative of sufficiency in an ecologically constrained world. After surveying the "brief and curious history" of the term efficiency, he devotes an entire chapter to the issue of efficiency ratios. The book's first half concludes with a critique of activities undertaken to foster greater consumption through increases in both worker productivity and individual spending. The latter point prompts some revisionist thinking; for instance, when a person has a job he enjoys both work and leisure, but if he becomes unemployed, does he then have endless leisure or no leisure at all?

The second half of the book, "Sufficiency on the Ground," examines key questions through specific examples. The Pacific Lumber Company in California could have logged redwoods in perpetuity had it settled for reduced profits today, but adverse discount rates (among other institutional deficiencies) won out over sustainable profits tomorrow. Conversely, a lobster fishery in Maine provides a success story; co-management shared by local lobstermen and state authority has surmounted problems of common-property rights. Toronto Island has achieved what many would view as laughably impossible: a carless community. In all three instances, an "enough" limitation has been paramount—albeit overruled in the first case while winning out in the other two. Also in each instance, the enough limitation reflects both social values and ecological restraints.

The book ends with an assessment of the fundamental question: How much sufficiency do we need to attain ecological stability? Princen postulates that the ultimate arbiter of what constitutes enough has been the institutional framework: "To say enough when more is possible, well, that is irrational. To say too much when life is full of uncertainty is to deny the role of risk taking and exploration and innovation, indeed, human progress." Tradition asserts that there's nothing that can't be made or done bigger or faster or cheaper. Well, there is: Earth's ecological bounds will proclaim

"Thus far and no further."

However idealistic Princen's prescriptions may appear to some eyes, he stresses that they are grounded in "established understandings of human capacity." He rejects "prevailing assumptions about humans' inherent short-term thinking, about their inability to self-organize for restrained resource use, about the insatiability of their consumption, about their inability to do much more than work and spend."

If I have a reservation about Princen's views, it is that he seems unduly critical of a strategy that offers vast (though far from all-encompassing) scope for sustainable consumption, namely, efficiency of resource use. Princen rejects that as somehow opposed to sufficiency, yet the two should surely be complementary. Although the reader encounters the efficiency issue at dozens of points in the book, I would like to



Restraining the catch. A Monhegan Island lobsterman tosses back a healthy lobster.

have seen more on efficiency gurus such as Amory Lovins, Paul Hawken, and William McDonough.

All in all, *The Logic of Sufficiency* is a first-rate effort at breaking new ground in the consumption debate. It often flies in the face of conventional wisdom—and not only of those who still rejoice in the prospect of endless growth of the established economy (and hence of consumption, usually two-thirds of that economy). Princen also contests the idea that "greening" of economies and consumption will accomplish the sustainability trick; he even sees greening as a distraction from the ultimate strategy of enough-ism. Conversely, he presents his message in strictly pragmatic terms: not as a visionary ideal but as a practical proposition for the Monday-morning world. He is not only a conceptual optimist, he has sufficient faith in human nature to assert that optimal-scale consumption is both a worthy purpose and eminently doable. In any case, although it may initially be difficult to live with sustainable consumption, it will be far more challenging to live by the credo that there can never be any such thing as enough.

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