

COMMENTS

AGAINST LUDDITISM: AN ESSAY ON THE PERILS OF THE (MIS)USE OF HISTORICAL ANALOGIES IN TECHNOLOGY ASSESSMENT

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History is a master because it teaches us that it doesn't exist. It's the permutations that matter.

Umberto Eco¹

You can never plan the future by the past.

Edmund Burke²

Conscious of the past, with all its horrors, we humans stand terrified as we confront an unknown future. Desperately, *homo sapiens*, the tool-maker, seeks a tool to aid and comfort us in our fear of the unknown.

History is the tool for which we reach to try to understand and thereby control an unknown future. It is a natural human tendency, built into the biology of our species, to try to understand the new by analogy with the familiar. Kahneman and Tversky call this tendency the "anchor and adjust" heuristic.³ When confronted by something new, the human mind assimilates it to the pattern of something familiar then adjusts the model in the light of experience.

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1. UMBERTO ECO, *FOUCAULT'S PENDULUM* 87 (W. Weaver trans., 1988).

2. Edmund Burke, Letter to a Member of the National Assembly, in *THE OXFORD DICTIONARY OF QUOTATIONS* 103 (2d ed. 1955).

3. Amos Tversky & Daniel Kahneman, *Judgement Under Uncertainty: Heuristics and Biases*, in *JUDGEMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES* 3 (Daniel Kahneman et al. eds., 1982).

In his classic study of human responses to technological changes, *Men, Machines and Modern Times*,⁴ Elting E. Morison provides an illustration of this phenomenon at work in human responses to a new technology. He tells of the time-and-motion expert hired during World War II to improve the procedures used by British artillery crews. At first the experts could not explain the moment just before firing when the crew paused and came to attention for a few seconds. The mystery was finally solved by an old colonel who, upon watching the films, pointed out that the crews were holding the horses (even though horses hadn't pulled the guns in a generation). Human beings cling to the familiar until forced by experience to change it.

A more recent illustration drawn from my own experience was my inability to convince a previous administration at the Yale Law School that it should purchase computers for the faculty rather than the secretaries. After all, these new-fangled machines had keyboards, didn't they, so shouldn't we give them to the typists?

The danger of understanding the future in terms of the past is that the analogy we pick will determine the lessons that we draw. As indicated in the epigraphs with which I began, history is more riddle than road map; there are many passages from which to choose. I agree with the epigraphs that history never repeats itself, and therefore, that arguments that something new is "just like" something old are perilous at best. But, unlike the more cynical view expressed in the epigraphs, I do not believe that history is irrelevant to understanding our present and future; only that we must approach her cautiously in order to draw deeper lessons.

I

In his Article *Vital Essences and Human Wholenesses: The Social Uses of Biological Information*, Professor Kevles proposes that we understand the import of recent biological advances "singly and collectively" by analogy to the eugenics movement, a subject that he has studied extensively.⁵ He suggests that recent advances in understanding the biochemical basis of life processes not only increase human powers to manipulate these processes, with all the attendant dangers that these increased powers could be misused for evil ends, but also in some way these discoveries inherently tend to objectify and reduce human beings.

4. ELTING E. MORISON, *MEN, MACHINES AND MODERN TIMES* 18 (1966).

5. See DANIEL KEVLES, *IN THE NAME OF EUGENICS: GENETICS AND THE USES OF HUMAN HEREDITY* (1985).

All will agree with Professor Kevles that the perils of Nazism must be avoided. Any technological advances that increase human powers to manipulate the environment raise the stakes—the possibilities of both beneficial use and destructive misuse increase. The shared wisdom of human experience, preserved in our myths from Eden and Aeschylus through *The Bonfire of the Vanities*,⁶ caution against the arrogance of increasing human power and the challenge to develop human wisdom adequate to manage our new found powers over nature and ourselves.

I part company with Professor Kevles at the second branch of his argument—really, his second implication, for he suggests and implies throughout rather than arguing squarely for this conclusion—that certain technological changes are inherently “unnatural” and tend to evil.⁷ It seems to me that human history from Genghis Khan through Adolf Hitler and Joseph Stalin (not to mention homelessness in the midst of America’s plenty), demonstrates that understanding the biochemistry of life is certainly not a necessary condition for denying the humanity of our fellow humans and treating them as if they were objects.

On the other hand, experience in my own field of environmental law illustrates the perils of allowing our collective fear of an unknown future to bias comparative assessments of technologies. In a seminal review of many examples, Peter Huber has shown that courts and the legal process systemically discriminate against newer technologies, even though they are often safer than the existing ones that they would replace.⁸ A few years ago, the late Nobel-prize winning scientist Hans Bethe proposed a thought experiment that made the same point more graphically in an article about nuclear power.⁹ Suppose, Bethe imagined, that nuclear power as a method for generating electricity had been invented *first*, and only later did someone propose that electricity be generated by burning the fossilized animal wastes that had recently been discovered in the ground (i.e., coal and oil). The rape of the landscape and the thousands of deaths from mining and air pollution resulting from the “new” technology of fossil fuel combustion certainly would have led activists to oppose replacing good, old familiar “nukes” with the dangerous, “new” fossil fuel-burning plants.

6. THOMAS WOLFE, *BONFIRE OF THE VANITIES* (1987).

7. KEVLES, *supra* note 5.

8. Peter Huber, *Safety and the Second Best: The Hazards of Public Risk Management in the Courts*, 85 COLUM. L. REV. 277 (1985).

9. Hans Bethe, *The Necessity of Fission Power*, SCI. AM., Jan. 1976, at 21.

The attitude that newer technologies are systemically safer than the older ones they supplant has been christened "technological optimism" by Professors Gillette and Krier, who argue that the case for an assumption that the new is necessarily better and safer than the familiar is at best unproved.¹⁰ Despite their including me within the ranks of the "optimists,"¹¹ I share their skepticism about new technologies. But I am equally skeptical about "technological pessimism," a far more pervasive view in our culture, which holds that the old and familiar is necessarily better and safer than the new. My motto on technology is "neither optimist nor pessimist be." I am neither believer nor atheist, but agnostic. And perhaps, more significantly, I am a bit fatalistic: I can think of no instance in which risk aversion and collective fear of the unknown has succeeded over the long run in preventing (as opposed to delaying and regulating) the introduction of useful new knowledge or techniques. In some sense, then, our culture's collective existential *angst* over whether the future will be better or worse than the past is perhaps more interesting sociologically and philosophically than it is relevant practically. The one thing that history really teaches about the future is that it is going to happen. We can shape it, perhaps even manage some of it, but we cannot long prevent it.

The Jeremy Rifkins of the world, whom Professor Kevles cites approvingly,¹² strike me as engaged in a quixotic quest if their goal is (as I perceive it to be) to prevent the introduction of new technologies, as opposed to managing and regulating them. Like the Luddites, the early nineteenth century English workers who smashed the new mechanical looms,¹³ they will not succeed.

The important question for new technologies is not whether, but *how*—or at least that is what the experience of technology assessment in the environmental area seems to teach. It is to that problem that I wish to turn.

II

Managing new technologies is a daunting task. In part, this is due to what has sometimes been called the law of unintended consequences.

10. Clayton P. Gillette & James E. Krier, *Risk, Courts and Agencies*, 138 U. PA. L. REV. 1027 (1990).

11. *Id.* at 1035 n.17, 1036 n.20.

12. KELVES, *supra* note 5.

13. MALCOLM I. THOMIS, *THE LUDDITES: MACHINE-BREAKING IN REGENCY ENGLAND* (1970).

The brains of individual human beings, and the social intelligence which is stored in human institutions, are inherently less complex than the world around us. Therefore, our best-laid plans are necessarily going to fail to account for everything, and thus some unforeseen and unintended effects will inevitably occur. The fact that we cannot rationally predict everything counsels that we should learn from the wisdom that evolution has stored in nature about how to adapt to a changing world.¹⁴ Since we must anticipate the unanticipated, we should follow nature's strategy of diversity and decentralization so that the artificial systems that we create are robust and adaptable to changes in the environment. Aaron Wildavsky—among others—has made this point forcefully.¹⁵

Biology never puts all of its eggs in one basket but instead favors diversity within populations. Small scale experimentation is less likely to result in catastrophic failure than is a rash commitment to broad-scale use of untested techniques. This, I submit, is really the deeper lesson that should be drawn from the history of the eugenics debacle. It would be superficial and incorrect, I submit, to conclude from the eugenics debacle that understanding the biological processes underlying human genetics is inherently dehumanizing.

The basic natural principle of diversity and cautious experimentation is reflected in a variety of sound governmental policies, from preserving the natural genetic diversity of species to giving greater scrutiny to field applications than to bench tests of new chemical substances.

I am, therefore, less troubled by Professor McGuire's suggestions in his Article for this symposium concerning making genetic testing and information available to parents¹⁶ than I would be by mandatory testing or treatment policies. One reason is the obvious and important distinction between coercion and voluntarism. Another, more subtle reason is our collective ignorance about the deeper implications of the new genetic technologies. Individual parents experimenting with a variety of responses is both more promising and less risky than making centralized decisions, even if particular decisions seem to be the wisest possible choices based on our current information.

14. For a general argument that human beings should model their approach to a changing environment upon nature's, see ROBERT OENSTEIN & PAUL EHRLICH, *NEW WORLD NEW MIND: MOVING TOWARD CONSCIOUS EVOLUTION* (1989).

15. See, e.g., MARY DOUGLAS & AARON WILDAVSKY, *RISK AND CULTURE* (1982).

16. Michael McGuire, *Biochemical Screening to Predict Behavior*, 65 S. CAL. L. REV. 565 (1991).

As human beings we cannot escape our tendency to analogize the new to the familiar, but we must pick our analogies with care. When confronted with new genetic information about “why” criminals commit their violent crimes, we are tempted, on first reaction, to assimilate the new information to an existing category such as the insanity defense. The purposes served by that hoary doctrine in the criminal law are unlikely to be much advanced by the new genetic information. An existing category that is better (because more useful) is testing, screening, voluntary counseling, and education (similar to the approach used for other genetic defects, such as Tay-Sachs disease).

Because the new technology promises (and threatens) to transform our collective understandings of what human beings are, and why they behave as they do, its ultimate applications are almost undoubtedly yet to be imagined. Our response, I propose, should be to accept the uncertainty of the future, not to deny it in the vain conceit that we are wise enough to control everything.

Like ancient explorers confronting new worlds, we should not cower and shrink from the unknown that lies ahead, but bravely go forth to discover new frontiers. At the same time, as the sergeant on *Hill Street Blues* used to say, “Let’s be careful out there.” Venture forth into new worlds, but do not send the whole tribe.