Nuclear power: How environmentalism lost its way

With all of nuclear power's environmental benefits, many have wondered at the intensity behind the antinuclear movement. History shows how influential ideologies shaped the early movement. Today, however, some environmentalists are beginning to rethink old dogmas.

By Paul Lorenzini

For four decades, nuclear power advocates have been fighting—and, for the most part, losing—an ideological battle. Today, the nuclear power industry faces policy-imposed challenges ranging from legislated prohibitions, to punitive economic policies, to mandates and stated policy goals that specifically push renewable energy to the exclusion of nuclear power. The specter of the premature closing of perfectly good operating plants because flawed economic markets do not properly value their attributes is the most glaring indicator of these policy failures. These policies have been imposed over a period of decades, largely at the insistence of a powerful environmental lobby reinforced by a campaign to intentionally exploit public fears. The nagging question is *why*.

It is fair to say that nuclear power carries unique risks, so some opposition might be expected. But the intensity and single-mindedness of the opposition, given nuclear's environmental advantages—a small ecological footprint, a noncarbon high-energy potential resource, and minimal emissions—have been hard to explain. By the early 1980s, scholars studying the environmental movement observed that "opposition to nuclear power has for many environmentalists become the key issue" and that nuclear power was "the most emotional and divisive of environmental concerns."[1]

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With the current concerns about climate change, some environmentalists have begun to challenge this dogma, as highlighted by Robert Stone's 2013 documentary, *Pandora's Promise*. It is not just carbon emissions that are involved, as recent studies have shown that the exclusion of nuclear power from current energy policies is posing an unreasonable threat to biodiversity.[2] But nuclear still faces an uphill battle. After years of intellectual, political, and financial investment, opposition to nuclear power has become a legacy within environmentalism that is deeply entrenched and, for new entrants, rote.

How did environmentalism get so lost?

A rising antinuclear movement

Today, the opposition to nuclear power from environmentalists is taken for granted, but it was not always so. During the 1950s, the Sierra Club supported nuclear power with the slogan "Atoms, not dams," and only adopted its antinuclear policy in 1974 after years of internal debate and in the face of pressure from a broader environmental community.[3] Even then, the vote of the Sierra Club's board was 9–4, with the two scientists on the board opposing the policy on the grounds that it would mean more environmental damage from coal—which, in fact, did occur.[4] Similarly, in 1962, the radical Students for a Democratic Society in its Port Huron Statement said, "Atomic power plants must spring up to make electrical energy available."[5] To those who wish to attribute nuclear power opposition to fears of nuclear weapons, it should be recalled that no generation faced the immediacy of that threat more than this generation, and yet support for nuclear power remained broad-based into the early 1960s.

During the next decade, all of that would change. By 1974, a full-fledged antinuclear movement had become well organized and had begun mobilizing a national resistance, including plans in 1976 for antinuclear initiatives in seven states. In spite of these efforts, public opinion was still supportive of nuclear power, as evidenced by the sound rejection of all seven of those antinuclear ballot measures. Frustrated by their defeat, the movement took to the streets with marches, sit-ins, civil disobedience, and physical trespass at nuclear plants across the country. Still, public attitudes would not begin to turn until 1980, in the wake of the 1979 accident at Three Mile Island. Added to this, there were increasing economic problems with new plant construction, exacerbated by slowing electricity demand, record high interest and inflation rates, plant cancellations, and post-TMI regulatory changes.[6]

So what changed between 1962 and 1974 to account for the single-minded embrace of antinuclear policies by a new environmental movement that was only then finding its identity? The answer lies with understanding the period during which all of this occurred, when the antinuclear movement grew from virtually nothing to an entrenched movement. We refer to that period today as "the Sixties," the span of time from the early 1960s through the early 1970s.

The new environmentalism

The Sixties has become a kaleidoscope of images—the Free Speech Movement; campus protests against the war in Vietnam; the counterculture, including psy-

chedelics, drugs, and liberated sex; the 1963 March on Washington, Freedom Riders, Selma, and race riots in various cities; the 1968 Democratic convention in Chicago; yippies and hippies—it is a long list. It is difficult to appreciate the intensity and raw energy that characterized the period, a rare time when people probed beyond traditional comfort zones and explored deeper questions of meaning and purpose.

It was out of this setting that a new environmentalism arose. What had historically been a concern with conservation and preservation was to change as a sense of impending crisis caused many to rethink the breadth and depth of the problem. If the environment were to be saved, the fabric of the culture would need to change—our social structures, our personal behaviors, our conceptions of growth, and our visions of what it would mean to create a sustainable society that was humanly fulfilling. Concern had been brewing since 1962, when Rachel Carson raised alarms about pesticides in *Silent Spring*, and peaked eight years later in February 1970 when *Time* magazine devoted a single issue to the environment, which it called "Nixon's new issue." The first Earth Day was held on April 22, 1970, drawing support from 20 million people across the country, and later that year the Environmental Protection Agency was formed, with William Ruckelshaus being confirmed as its first administrator on December 2, 1970.

Modern environmentalism grew out of this sense of urgency that few would question today. Damage was being done and things needed to change. But why did those changes result in such intense hostility to the one resource that could have and should have been part of the solution?

The answer lies in the context, one in which established institutions were no longer trusted and traditional values were being questioned. Central to these values was a conception of progress that embraced the legacies of the Enlightenment—its confidence in science and its belief that science would give humans a better life. It was out of that context that nuclear power had been placed on the American political agenda in the first place.

"Enlightenment America"

For much of the country's history, Americans believed that human progress would be achieved through advances in science, and this belief informed the early enthusiasm for peaceful nuclear power. Vannevar Bush, director of the U.S. Office of Scientific Research and Development, had expressed this view forcefully in 1945, writing that science was key to our future and that it would mean "more jobs, higher wages, shorter hours, more abundant crops, more leisure. . . . Advances in science will also bring high standards of living, will lead to the prevention or cure of diseases, will promote conservation of our limited natural resources, and will assure the means of defense against aggression."[7]

While Hiroshima and Nagasaki had exposed the ugly side of science, in December 1945, within months of the bomb detonations and at the urging of President Truman, Sen. Brian McMahon (D., Conn.) introduced a bill that would ultimately be enacted as the Atomic Energy Act of 1946. He declared it to be "the policy of the people of the United States that development and utilization of atomic energy shall be directed toward improving the public welfare, increasing the standard of living, strengthening the free competition among private enterprises so far as practicable, and cementing world peace."[8]

President Eisenhower drew from this when he later delivered his "Atoms for Peace" speech to the United Nations in December 1953. Falling on receptive ears, there was a collective hope that it could be true that these new atomic discoveries could be used for something good. Americans, although sobered by the threat of nuclear weapons, were almost exuberant about the possibilities that these new mysteries would hold for humankind. When plans to build the first commercial nuclear plant outside Pittsburgh were announced in September 1954, the *Denver Post* ran with the headline, "Dream Come True."[9]

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And so, when opposition began to surface in the early 1960s, it caught the industry off guard. In 1963, *Nucleonics* wrote that the nuclear industry had so far not seen "unreasoned fear" and that there was a general belief that "public acceptance would not be a problem." But during the prior year, the "industry had been shaken" to find some in the public "suddenly speaking out against proposed nuclear stations," specifically projects at Ravenswood, in New York City, and at Bodega Bay, Malibu, and San Onofre, all in California.[10] While these were not part of any network of opponents, it was, in a sense, the canary in the coal mine. During the next decade, a national movement would form and become fully organized by 1974. What few realized at the time was that the spirit of this movement was grounded in a different vision—one that challenged the Enlightenment's confidence in science and that emphasized the darker sides of modernity and associated them with much that was going wrong in America.

The backlash of the Sixties

Resistance to Enlightenment thought has a long history, going as far back as Jean-Jacques Rousseau and later the Romantics, ultimately framing what was to be a defining tension in Continental philosophy throughout the 19th century. In many respects, it came to a head with Friedrich Nietzsche's attacks on modernity.[11] Oxford historian J. W. Burrow writes: "By the end of the century it was becoming both a cliché and a mark of some intellectual sophistication to speak of the limitations of the scientific method and even, fostered by Nietzsche, of the obstacle the cult of scientific detachment presented to life."[12]

This thinking would migrate to America early in the 20th century, embraced by an intellectual avant-garde and a rising subculture of the "Beats." Expressed largely through art, music, literature, poetry, and even architecture, it was called, by Columbia University humanities professor Lionel Trilling, an "adversary culture," marginalized, on the outside looking in, and hostile to existing "bourgeois" values.[13]

It was a stance nurtured and reinforced by two of the most influential thinkers of the period, C. Wright Mills and Herbert Marcuse. Both saw the affluence of the 1950s and the wealth of advanced technological society as seductive drugs that led to political apathy, with minions losing any sense of what it means to be truly human and becoming pawns of a corporate power structure that was being allowed to run amok because no one cared. People were content with their new-found affluence. Mills called them "cheerful robots," and Marcuse called for a "Great Refusal," a massive rebellion against affluent apathy and the advanced technological society that had given rise to it.[14]

The Sixties can be understood in many ways, but as a shift in the culture, the changing role of this adversary culture is symptomatic of its underlying character. Harvard sociologist Daniel Bell, writing in 1976, contended that the adversary culture had moved to the mainstream and taken control of the reins of cultural power—"the publishing houses, museums, and galleries; the major news, picture and cultural weeklies and monthlies; the theatre, the cinema, and the universities."[15]

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Conceptions of progress that had relied on science and technology and growing wealth were now called into question. The periodical *Daedalus* was concerned enough that its entire Summer 1974 issue was devoted to the topic "Science and its Public: The Changing Relationship." Troubled by "suspicion voiced in many quarters about the legitimacy and utility of certain kinds of scientific endeavor" following the Sixties, it was noted that some feared that "science and technology have taken a severe beating from which they will not recover," that "faith in science and technology as an engine of social progress has come to an end," and that there was a "deep distrust of science."[16] The issue had been prompted by Harvard's Gerald Holton after he and others observed a dramatic drop in students interested in science careers during the prior decade. Today, a continuing concern remains that the role of science in modern America has been compromised.[17]

Setting the tone

All of this found its way into the environmental conversation and influenced its outcomes. It can best be traced by focusing on the role of three key figures: Barry Commoner, Lynn White Jr., and E. F. Schumacher.

Barry Commoner

A biologist and professor at Washington University in St. Louis, Commoner had become influential enough that he was featured on the cover of the February 2, 1970, issue of *Time* with the blurb "Ecologist Barry Commoner: The Emerging Science of Survival." In *The Closing Circle: Nature, Man and Technology* (1971), Commoner expounds his view that the ecological crisis was a consequence of uncontrolled technology, with advances rarely taking into account the unintended effects on the environment.[18] While citing any number of examples—such as pesticides and plastics—he candidly observes that his concerns began with nuclear weapons: "I learned about the environment from the United States Atomic Energy Commission. . . . I was overwhelmingly concerned with the new, enormously destructive force of nuclear energy born during the war." By 1971, these concerns had morphed into a rigid opposition to commercial nuclear power, a position that appears to have pivoted almost entirely around the issue of radiation and its health effects.

It is a curious issue. Almost without regard to what one assumes about the health hazards of radiation, nuclear power's contribution is *de minimis*. This is of little regard to Commoner, who makes no effort to consider proportionality. For nuclear power, he imposes an arbitrary and impossible standard of zero exposures, a first indication of his predisposition to oppose nuclear power under any circumstances.

Nuclear power becomes an archetype for his much broader critique of our environmental crisis and its links to science and technology. For Commoner, World War II was the great dividing line between "the scientific revolution that preceded it and the technological revolution that followed it."[19] The uncontrolled expansion of these new technologies had so damaged the environment that "the age of innocent faith in science and technology may be over," he wrote.

Nuclear energy seemed to singularly epitomize this loss of faith. Coal burning is addressed in a single sentence that quickly morphs into an indictment of nuclear power, emphasizing the hidden costs of power production.[20] The impacts of all renewable resources are ignored, and the reader is left to speculate about the underlying reasons for this. Perhaps it was inevitable, given his opposition to nuclear weapons and his animosity toward the Atomic Energy Commission after the debates over radioactive fallout, or perhaps nuclear power stood alone in his mind as the icon of science and technology gone wrong. Or perhaps it was both of these. But in the end, while Commoner is a scientist and stresses the role of scientists as a moral vanguard, there is very little science in his opposition to nuclear power, no real sense of proportion, and no effort to defend this indictment based on any comparative assessment of alternative resources.

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Lynn White Jr.

Lynn White Jr. was a history professor at the University of California at Los Angeles who wrote what has become a landmark essay, "The Historical Roots of our Ecological Crisis" (1967).[21] He is perhaps less well known, but in the realm of environmental ideology, few have been more influential. White blamed the environmental problem on Christianity, first as the foundational basis for a scientific revolution leading to a society where science and technology have flourished, and second, because of its mandate in Genesis to "have dominion over nature." Like Commoner, White associated the ecological crisis with science and technology and added the ethical dimension that humans have felt free to "exploit nature" for their selfish purposes. In his view, this ethic was critical—this Christian view that humans have more value than nature, so-called anthropocentrism. He argued for a new ethic that would make humans and nature equal, replacing Christianity with a kind of spiritual pantheism and holding up Buddhism as an example.

White's ethic caught hold and became a defining feature of the new environmentalism. It was a central tenet of Deep Ecology, which evolved in the early 1970s, weaving its way into any number of creedal statements of philosophy for environmental groups and becoming a key plank in what sociologists have called "The New Environmental Paradigm."[22] By the 1990s, public surveys showed that large majorities were embracing the idea that we humans are equal to nature and not special creations.[23]

It was left to Australian philosopher Raimond Gaita, writing about the concerns of aboriginal peoples, to note that no society has ever treated humans as equal to nature, and we do not find this equality in ourselves, in spite of our rhetoric to the contrary.[24] As he has observed, the "preciousness of human beings" is fundamental to our nature as human beings. We don't treat killing our neighbor in the same way we treat swatting a fly. One can pretend to deny the significance of the distinction we place on human life, but it is hard to do so seriously, leaving one to wonder if an emphasis on this ethic has elevated nature or devalued humanity.

Yet as an ethic, it fed the ideal of "harmony with nature," that together with an animus toward science and technology became in E. F. Schumacher an environmental religion.

E. F. Schumacher

In 1973, E. F. Schumacher wrote the ideological gospel for a new environmentalism, *Small is Beautiful: Economics as if People Mattered*.[25] Drawing from his experiences in India and Burma, Schumacher became passionate about two things. First, he saw advanced technologies being imposed on Third World countries in ways that were destructive. It led to a global "appropriate technology move-

ment," calling for common-sense wisdom to match technologies to the culture and social structures in which they were being deployed.

His second thrust, however, was an example of utopian idealism run amok. Seeing Third World countries as an example of living in harmony with nature, with the dubious claim that people were living more satisfied lives, he called for a massive restructuring of modern society to model themselves after these "small" societies. What resulted was the attempted force-fitting of a set of ideas built on these premises into social structures that never became small.

Here, too, technology was the problem, in his view, an almost animate force that was "out of control" yet taking us on a destructive journey: "The modern world has been shaped by technology. It tumbles from crisis to crisis; on all sides there are prophecies of disaster and, indeed, visible signs of breakdown." But Schumacher goes further and turns this to an animus toward science itself. Echoing themes expressed by sociologist icon Max Weber in his essay "Science as a Vocation," he argues that the study of science is a wasted life. "Science," he says, "cannot produce ideas by which we could live. . . . If a man seeks education . . . because his life seems to him empty and meaningless, [science] tells him nothing about the meaning of life and can in no way cure his estrangement and inner despair."

On the one hand, Schumacher and others would insist that they are not opposed to science and technology per se, just its unwise use. Yet their skepticism toward science and technology, even toward scientists themselves, sets a tone. Solutions must be "soft" and must harmonize with a romanticized view of nature. It becomes what one thinker has called "sociological science": As our confidence in science is weakened, "people find it easier to come to whatever conclusions they desire for the sociological ends they wish to see achieved."[26] Science, in other words, becomes a means to manipulate support for ideologically motivated ends.

While Schumacher, Commoner, and White set the tone, in the end it was left to Amory Lovins to rather brilliantly bring all of this together in his now famous 1976 *Foreign Affairs* essay, one that has largely provided the framework for global energy policies since, built around the three key themes of (1) energy efficiency, (2) renewable resources as a final end objective, and (3) no nukes.[27]

Losing their way

Years later, in the preface to the 1989 release of *Small is Beautiful*, a good friend speaks of Schumacher's influence: "'Small is Beautiful' became a rallying cry. Politicians yearned to be seen absorbing [Schumacher's] wisdom, even if they had little or no intention to do anything about it." He argues, however, that Schumacher was misguided on nuclear power: "His attack on nuclear-generated electricity lacked any persuasive analysis of the costs, benefits, and risks of alternate energy scenarios; he chose instead to reject nuclear power on dubious environmental grounds, and also because its generation requires engineering complexity and large corporate and governmental organization."[28]

This failure of balance and of any sense of proportion virtually defines the historical opposition to nuclear power among environmentalists. The blind opposition is nowhere more evident in Schumacher than his willingness to embrace coal as an alternative: "What after all is the fouling of the air with smoke compared to the pollution of the air, water, and soil with ionizing radiation," which he calls "an evil of incomparably greater dimension than anything mankind has known before."[29] What we have here is not science but superstition. Although dozens of studies have shown that coal has far greater health and environmental impacts than nuclear power, environmental opposition had the effect of displacing nuclear power with coal.

All of these analyses attack nuclear power yet spurn any rigorous assessment of alternatives. Nowhere in Lovins's essay, for example, is there any serious consideration of the environmental issues and challenges associated with solar, wind, or any other renewable resource. It is taken on blind faith that their "environmental impacts are relatively small." Meanwhile, nuclear power was singularly reviled.

The problem with understanding the early evolution of an antinuclear movement is the way it defies simple answers. The movement arose out of an ideological alliance between the new environmentalism, a growing cultural skepticism of science and technology, and, aligning with the New Left, a pervasive mistrust of government and the role of corporate power. It was reinforced by a war-weary America whose peace activists were uninterested in distinctions between commercial nuclear power and nuclear weapons. All of these were combined with a sense of pending ecological catastrophe. Weighing into this as well was the legacy of mistrust and radiophobia from debates a decade earlier over radioactive fallout. Today, as miles of mountain ridges are leveled for wind projects, and as large swaths of pristine desert lands are condemned for solar projects with devastating effects on local biodiversity, we are, as some have said, being "mugged by reality" as the realization sets in that something has been basically flawed in our environmental thinking.[30] As noted earlier, even one of the more cherished environmental concerns, biodiversity, is being compromised by the exclusion of nuclear power.

A value-driven approach

If we roll the tape back to the 1960s, clearly there was a need to impose proper boundaries on technological advancement: the need to be aware of environmental consequences and factor that into decisions, the need to match the technology to culture and infrastructure in developing countries, and the need to become more efficient to minimize the stresses placed on resources. Thoughtfully pursued, those boundaries would not have driven us away from nuclear power but toward it. If more rigorous scientific principles had been followed, it would have meant (1) a more critical response to the simplistic notion that renewables are "peaceful, benign, and environmentally friendly," simply because they are "renewable"; (2) a more realistic assessment of coal and the universal adoption of policies giving preference to nuclear power over coal; and (3) an appreciation of the environmental value of nuclear power, not just its low-pollution and noncarbon attributes, but more generally its efficiency in utilizing natural resources. What is needed is a rethinking of original premises—one that appreciates the role of science and technology, that places its emphasis on meeting human needs while minimizing our ecological footprint, and that culls out ideologies that may be working against the very goals that motivated a new environmentalism in the first place.

The "EcoModernists"

Recently, a group of environmentalists, activists, and writers calling themselves "EcoModernists" have responded to this challenge. They have observed that we have entered an era that places humans in a new role with respect to planet Earth, an "Anthropocene" epoch in which the impact of humans is so great we are now, in effect, "remaking the Earth." Our modern challenge is to adapt to this new reality, keeping in mind a clear goal: "Making life better for people, stabilizing the climate, and protecting the natural world."[31]

In doing so, they offer a twofold critique of traditional environmentalism. First, we must embrace science and technology: "Knowledge and technology, applied with wisdom, might allow for a good, or even great, Anthropocene"; and second, we must reject the premise "that human societies must harmonize with nature to avoid economic and ecological collapse." In particular, they challenge the romanticized notion that "early human societies lived

more lightly on the land than do modern societies." They didn't. "The technologies that humankind's ancestors used to meet their needs supported much lower living standards with much higher per-capita impacts on the environment," according to the EcoModernists. To the extent that they seemed to have lighter impacts, it was largely because they were supporting much smaller populations.

Rethinking our framework means "decoupling" with nature, utilizing technology to maximize our use of resources while minimizing our environmental impacts. Sustainable energy that meets these conditions is critical for improving the human condition, and no resource accomplishes this better than nuclear power.

What's to be done?

Pursuing this new framework requires a radical rethinking within the environmental movement of underlying goals and ideologies. While grassroots environmentalists are already beginning to ask the hard questions and EcoModernist thought leaders are rising to the occasion, corporate environmentalism—think "Big E": the leaders of the old guard at the Sierra Club, the Natural Resources Defense Council, the Union of Concerned Scientists, and others like them—remain dogmatic and resistant to change.[32] Partly they have been locked into outdated paradigms, and partly they are held captive to sources of funding that have been sold on those paradigms. Yet it is at that level that public policies are being influenced, and so it is at that level that change will need to occur. It is not enough simply to point to obvious flaws as the EcoModernists are doing; there is a need for an accompanying narrative that gives context and perspective to show how we got here in the first place.

It is, in a sense, a *Bridge on the River Kwai* moment. In the classic 1957 movie starring Alec Guinness and William Holden, a British colonel (Guinness) in a Japanese POW camp, after enduring torture and other deprivations, seems to settle his differences with the Japanese commandant of the camp and oversees with enthusiasm the construction of a bridge for his captors, oblivious to the efforts by British commandos (led by Holden) to destroy it. Finally, in the midst of a commando attack, which at first horrifies him, he has a "What have I done!" moment and comes to his senses. It's at that moment when the light goes on, and we realize how far we have strayed from our original purposes.

Nuclear proponents have insisted for years that "we are all environmentalists," but it has fallen on deaf ears because mainline environmentalism was so influenced by blinding ideologies. Yet it is becoming increasingly clear that "Big E" environmentalists are insisting on non-environmental solutions because dogma says they must, all the while losing sight of the real goal: minimizing our environmental footprint while we serve human needs. Our task at this point is to tear down the Berlin Walls of ideology that have so divided us, engage serious environmental leaders and reopen a dialogue, realign our collective goals, merge our combined energies, and strengthen the focus and execution of national policies so as to place appropriate value on nuclear power. What we all want is to *really, truly* achieve an economically viable, sustainable environmental future.

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