



EDITORIAL

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Editor

The roots of sustainability science: a tribute to Gilbert F. White

While the intellectual shoots of sustainability science are tangled and diverse, one of the most important taproots surely springs from the pioneering work of geographer Gilbert F. White who passed away in October, 2006 at his Colorado home at the age of 94. From our present-day vantage point, it is difficult to fully grasp his prescience because the once-radical views he proffered regarding nonstructural adaptation to hazards are now considered unexceptional in most quarters. This awareness, unfortunately, has not been easily translated into action. In many parts of the world, ineffectual policies and individual impertinence have stymied change and the number of people living in harm's way has continued to spiral upward. White devoted his life to trying to break us of our habituated practices and their tragic consequences.

Through teaching, writing, public service, and charitable undertakings, White began as early as the 1930s to challenge deep-seated ideas regarding human control of the natural environment. One of his most important insights, formalized in his 1942 doctoral dissertation, *Human Adjustment to Floods*, questioned the warrant of large-scale water diversion projects. Such an allegation was heretical, even misanthropic, at the time. After all, in the United States and elsewhere, massive land transformation programs were being implemented. The Tennessee Valley Authority, the Army Corps of Engineers, and the Bureau of Reclamation were ascendant and thousands of wide-eyed visitors came to tour the imposing facilities built under the aegis of these public bodies. This was a period of major levee construction along the Mississippi River and colossal dam development in the western states. White drew attention to the short-sightedness and ultimate futility of these efforts and simultaneously cultivated a wisdom that today buttresses key tenets of sustainability—the obligation of current generations to the future, the need to adapt ourselves to the limits of biophysical systems, and the quest for right livelihood.

An important thread in White's proto-sustainability research was how societies adapt to

uncertainty generated by the changing frequency and scope of hazards such as flooding, drought, land degradation, and climate variability (see, in particular, Burton et al. 1993). Together with colleagues, he studied resilience to vulnerability and this work gave rise to a prominent school of risk analysis that has spread far beyond its original field of geography and infiltrated a diverse array of domains, including the sociology of risk (Cohen, 1996; Renn et al. 2001), decision sciences (Kleindorfer et al. 1993; Pigeon et al. 2003), environmental assessment (Flynn et al. 2001; Farrell & Jäger, 2006), and development studies (Pelling, 2003; Bankoff et al. 2004).¹

For all of its discomfiting potency, White's original work on hazards represented an extension of claims advanced nearly a century before by George Perkins Marsh, the Vermont-born diplomat and polymath who meticulously documented the profound and unremitting effects of human enterprise on the landscape (Lowenthal, 2000). However, technology through the end of the nineteenth century remained comparatively rudimentary and modifications consisted principally of agricultural conversion, logging, and mineral extraction. During the years following World War I, industrial production became far more directed, dynamic, and capable. At its core were fossil fuels and novel modes of applied science that, when yoked together, allowed for the fundamental reengineering of entire regions.

In the United States, behemoth earthmoving machines reconfigured the physical geography of whole river basins that once suitably reshaped, were further transformed by ambitious development schemes organized around natural-resource appropriation and energy production. White spent most of his life chairing countless taskforces—several of them under White House or Congressional auspices—to mitigate the flood damage caused by these ill-advised and

¹ Although White himself was not a member of the faculty, the Graduate School of Geography at Clark University provided an especially fertile institutional setting for these multifaceted and interdisciplinary endeavors during the 1970s and 1980s.

seemingly inexorable pursuits. He began gravitating toward this vocation while working as a staff secretary for the Natural Resources Planning Board, a federal agency that served as a laboratory for innovative New Deal regional planning. After being interned in Baden-Baden during World War II, White was appointed president of Haverford College (at the age of 35) and held this position for a decade until he became chair of the Department of Geography at the University of Chicago. During this period he concurrently served as president of the American Friends Service Committee (AFSC) and led numerous study teams investigating water management in Africa, Southeast Asia, and elsewhere around the world.²

Perhaps more than anyone else, White nurtured many of the principles that would eventually give rise to the contemporary concept of sustainable development. For example, in 1952 he delivered a series of speeches calling upon affluent industrialized countries to help developing nations formulate conservation strategies that could foster economic development. As a Quaker, and in conjunction with AFSC, White maintained an indefatigable interest in voluntary service and domestic and foreign humanitarian assistance. His activities in this realm during the 1950s resulted in a series of AFSC assistance programs that eventually became the template for the Peace Corps.³

White carried these ideas forward into the global arena through his work forging international scientific alliances designed to focus public attention on a growing array of global environmental problems (including the threat of nuclear war). He became involved with the Scientific Committee on Problems of the Environment (SCOPE) during the late 1960s and served as president of the group during the critical years following the 1972 United Nations Conference on the Human Environment in Stockholm. As a result of his vaunted position and personal capacity to mobilize scientific expertise, White came to play an important role in the development of the United Nations Environment Program and several allied institutions.⁴

His academic pursuits epitomized the schizophrenia inherent in geography and he resided

throughout his life in the precarious netherworld between the natural and social sciences. Neither geologist nor sociologist, his work did not fit into conventional categories and orthodox scholars were perpetually suspicious about his disciplinary loyalties. To add further complication, White practiced a highly pragmatic and applied mode of research that was never fully embraced by the more cloistered standard-bearers in the field.⁵ Rather than analytic rigor or theoretical elegance, he devoted himself to expanding the range of human choice and this commitment prompted some of his more truculent critics to chide him for being a social engineer and for consorting with the political establishment. Though similar criticism persists today, White's balance of academic inquiry, public service, and participatory action provides sustainability scientists with a valuable model of how to effectively integrate intellectual activity with worldly engagement. A consortium led by his former student Robert Kates succinctly captured this commitment a few years ago, writing that "[i]n areas like climate change, scientific exploration and practical application must occur simultaneously. They tend to influence and become entangled with each other" (Kates et al. 2001).

White's ability to navigate successfully between the realms of science and politics was at least partly attributable to his sanguine understanding of the relationship between scientific expertise and policy making. The real challenge for him involved getting relevant research into the hands of resource managers and their political overseers. This resolve was perhaps most visibly demonstrated upon his relocating to the University of Colorado where he founded the National Hazards Research and Applications Information Center (now the Natural Hazards Center). Since its 1974 inception, the Center has sought to bridge gaps separating scientific investigation, policy formulation, and tangible action. The Center's annual summer retreats provide collaborative forums for researchers, policymakers, and practitioners involved in hazard mitigation and disaster preparedness, while its bimonthly report, *Natural Hazards Observer*, offers a straightforward digest of news and professional information. Steadfast dedication to this brand of managerialism served White well during most of his career.⁶

² For a comprehensive review of White's lifetime achievements, Robert Hinshaw's (2006) biography is an indispensable resource.

³ Hinshaw (2006) recounts an invitation that White received from Sargent Shriver, the founding director of the Peace Corps, to return to Washington to serve as his assistant. White turned down the opportunity because he had only recently taken up his position at the University of Chicago.

⁴ More recent initiatives such as the International Human Dimensions Program on Global Environmental Change, an outgrowth of SCOPE, are consistent with White's vision of combining scientific inquiry, interdisciplinary investigation, and global collaboration.

⁵ The historical basis of White's intellection orientation, as well as the utility of his pragmatism, has been the focus of considerable discussion. See, in particular, Kates (1987), Wescoat (1992), Sunley (1996), Proctor (1998), Staeheli & Mitchell (2005), and Hobson (2006).

⁶ Hinshaw (2006) relates an anecdote where White, soon after launching the Center, informed his newly-hired assistant that she would likely need to find another job in two or three years. He

It is probably fair to say that White's activities during the latter decades of his life—specifically his chairmanship of the Nevada State Technical Review Committee on Socio-Economic Effects of Nuclear Waste Disposal from 1986 until 1993—strenuously tested this propitious view of science in the service of technical decision making. A sadly ironic consequence of his long life is that White lived to witness the pitiful government response to Hurricane Katrina in 2005 and the political fallout generated by such tragic malfeasance. There may be, though, some recompense in the fact that with New Orleans swamped by several putrid feet of water and the Gulf Coast a shambles few knowledgeable observers had the temerity to refer to the catastrophe as a “natural” disaster.

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apparently believed that the task of disseminating expert knowledge to hazard managers could be completed during this relatively short timeframe and the Center would then be able to close its doors.