

Robert W. Kates (1929–2018): Grappled with problems of the human environment

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Robert W. Kates died April 21, 2018, at age 89, a geographer who studied the relationship between society and environment and whose commitment to collaborative science kept his colleagues busy with big questions, big projects, and the challenge of fixing problems imbricated in the human use and transformation of the Earth.

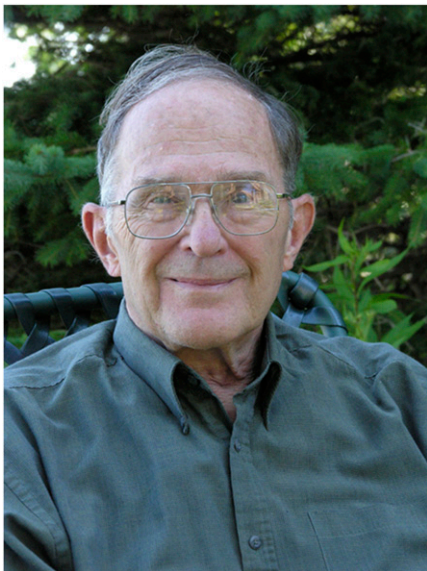
Schooled in Brooklyn, but doubting an academic life, Bob eschewed college and moved with wife Eleanor (Hackman) Kates in 1949 to Gary, Indiana, where he worked in the steel mills for over a decade and where Bob and Eleanor started a family. Thinking of becoming a teacher, Bob took time out from union organizing to take night classes at the Gary Campus of the University of Indiana in 1958. Martha Church, a doctorate student in geography at the University of Chicago—later to become president of Hood College—taught one of those classes, recognized Bob’s scientific

talents, and introduced him to Gilbert White, chair of the University of Chicago’s Department of Geography. This encounter started a lifelong collaboration and friendship, and the longest-running of Bob’s life’s many projects: to understand the human response to natural extremes. As with other big questions, Bob pursued this as a group endeavor, with Gilbert, fellow doctorate student Ian Burton, and a host of others still occupied in the effort today. The challenge for the field of natural hazards, codified in their 1978 book *The Environment as Hazard* (1), was to move the focus away from physical events and on to the social structures and behaviors that were as important, or even

more so, in determining the human costs of extremes. This stemmed from Bob’s field studies following the Great Alaska Earthquake of 1964, where he found the drawn-out argument among geophysicists as to the “correct” Richter magnitude of the event to be rather missing the point; an observer on the ground could plainly see that differential ground shaking interacted with varied surface conditions, homes, businesses, pipelines, highways, and all of the rest, to disrupt life and reveal a deep and troubling vulnerability.

For his 1962 doctoral dissertation (2, p. 111), Bob had interviewed residents of LaFollette, Tennessee about their flood experiences, finding an “atrophy of time” in which adjustments adopted after a flood were relaxed in the interval before the next one. He wrote of residents’ “immediate post-flood stocking of sandbags, then gradually getting rid of the sand and saving of the bags, until now they were uncertain as to the location of the bags” (2). Bob’s tone at uncovering the foibles of human response to natural hazards was not reproach but respect for the humanness of it all. He worried, however, over what he called the catastrophe hypothesis, that adjusting to smaller events over time positioned development for catastrophic losses from rare extremes, finding grim support for this effect in Hurricane Katrina (3).

Bob found “box and arrow” diagrams from early systems thinking useful for stitching together disciplines, hypotheses, and collaborators, and his eye was drawn to the “human activities” box that sat stippled on one side of the Bretherton earth systems diagram (4). Bob had created the equivalent a decade earlier, in the “human ecology” model of natural hazards (5), which in a sense filled-in Bretherton’s “human activities” box. This marked another big project: to bring the social sciences into full partnership among the earth systems sciences. In this early stage of global change research, natural scientists were grappling with how humans were changing the planet. They wanted to put a vector on that forcing function, whereas Bob pushed for a fully interactive analysis,



Robert W. Kates, independent scholar, at his home in Maine. Image courtesy of Dennis Chinoy (photographer).

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with each subsystem, human and environment, changing the other. He then championed this effort via development of climate and society research (6), and through a large, collaborative study of *The Earth as Transformed by Human Action* (7).

While urging earth systems scientists to embrace social scientists as partners, Bob also had to entice the social scientists, who sometimes bristled at reference to the “soft” sciences, and at the subservient role of simply completing the earth systems model with a human box. In a 1979 summary plenary talk to the World Climate Conference in Geneva (invited and penned on the spot), he observed that, after a week of listening to the multiple problems of pinning down atmospheric forcing mechanisms and debate about the robustness and resiliency of the atmospheric system, “I don’t feel soft at all” (8). Still, Bob admired the natural sciences, and was especially impressed by meteorologists’ skill in mounting global-scale, coordinated projects (as he watched the World Weather Watch become the Global Atmospheric Research Project). He urged social science colleagues to think in terms of this big science, and when he won the first major social science effort funded by the National Science Foundation’s Atmospheric Dynamics Program in 1977, he named the project CLIMPOP (for “Climate and Population Dynamics”), giving it similar scope, with comparative projects in the African Sahel, the Tigris-Euphrates Valley, and the United States Great Plains.

Bob’s fondness for comparative case studies, with as much quantitative data as could be assembled, reached back to global studies of natural hazards, through climate and society analyses, to his work on risk assessment, hunger, and technological hazards. Bob also found typologies useful in early development of interdisciplinary studies, such as technological hazards. He and a fellow geographer, physicist, and psychologist anchored the field in a key paper

offering a typology meant to reveal the fundamental nature of the thing (9).

Bob’s big projects have left a valuable legacy of schools of thought, inspired researchers, and centers of excellence. He spent much of his career (1962–1986) at Clark University, helping to found the Center for Technology, Environment, and Development (now the George Perkins Marsh Institute), and then the World Hunger Program at Brown University. Many of his ideas on sustainability were forged during time studying household water provisioning in East Africa, where he and wife Eleanor helped create the Institute of Resource Assessment in Dar es Salaam, Tanzania. Bob left his mark on several other institutions, like the Intergovernmental Panel on Climate Change, the Mitchell Center for Sustainability Solutions at the University of Maine, and dozens of National Academy of Sciences committees, ranging from human dimensions to the human rights of scientists, most recently “America’s Climate Choices.” Along the way he won many awards and prizes, including in 1981 the first MacArthur Prize Fellowship, which came to be known as “genius grants.” For his fundamental contributions to science, Bob was recognized with the President’s National Medal of Science in 1991.

Bob made his last home on the coast of Maine as an Independent Scholar and Presidential Professor at the University of Maine, embarking on what he called “the most interdisciplinary effort of my professional life”: Sustainability Science. In collaboration with dozens of colleagues (10, 11), he wanted the field, and the PNAS section on Sustainability Science, to provide a focal point for sustainability researchers and practitioners around the world. This circled back to Bob’s definitive project—answering the question “What is and ought to be the human use of the earth?”—which, as he wrote in his own retrospective on his website (www.rwkates.org), he “pursued collectively, with mentor, colleagues, students, and friends.”

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