

Appreciation for a 1962 dissertation and its author Robert W. Kates (1929-2018)

Bab Kates passed away April 21, 2018. For six decades Bob pioneered environment and society scholarship, on weighty matters such as climate change, risks of technology, hunger, sustainability of the human project and, at the start, flooding.

One of the pleasures of building this website with Bob was more opportunities to talk with him, and, as his friends and colleagues will know, coming away each time with big questions, new assignments, and a sense that there's much more work to be done on the sustainable human use of the earth.

Another pleasure has been reading his early work. While checking the scans for missing pages, my attention would get caught by a particular second-order heading, like "Latent Opportunities and the Atrophy of Time" in his 1962 dissertation on flood adjustments (see the books drop-down menu under publications). So I sat down and read the whole thing, noting the early insights into problems we grapple with today, and enjoying the writing (more perhaps than he did slogging through drafts of my dissertation back in 1980) and appreciating his appreciation, sometimes understated, for the humanity of natural hazards.

The dissertation raises many of the big questions about hazards still pondered: How can we reduce hazard losses when the human response to low probability events is so, well, human? Bob finds evidence among floodplain residents for a problem we must consider with regard to climate change: a sharp attenuation of ability to envision any event much larger than those of the recent experience, and the atrophy of concern and adaptation that sets in with time following a hazard occurrence. And he frames the most worrying question that continues to occupy many of us today, especially in post-Katrina time: Might our efforts to protect communities with technology and engineering actually increase the potential for large losses in the future?

For his dissertation, Bob interviewed residents of LaFollette, Tennessee about their flood experiences, and the "atrophy" of adjustments made after a flood was captured in this sentence that sums it all up:

"A number of commercial respondents cited to interviewers their 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."

Bob's tone at uncovering the foibles of human response to natural hazards is not reproach but respect for the humanness of it all.

And he finds that both lay and technical apprehension of the flood hazard is very human. Bob especially appreciated the telling differences between hazard assessment of experts and those of laity, noting wryly where the two diverged but also revealing where they converge---and often gently chiding the technicians, citing, for instance, the informal way that seismologists settled on a final Richter number for the great Alaska earthquake of 1964. Here though his attention is on floodplain residents and their sense of the hazard; still, outside experts come in for scrutiny because their analyses and decisions so much affect the residents, but also because the distinction between technical and lay assessment appeared less sharp on close inspection: both groups, like

the rest of us, are poor statisticians. In hydrology and engineering analyses of flooding in LaFollette, he finds

“some evidence that certain probability distributions are valued in excess of their mathematical expectation.”

The residents disregard the underlying distribution, preferring the certainty of denial, but the experts do so too, through the denial of uncertainty:

“Considerable engineering judgment appears to have been employed in the actual estimation of the regional and probable maximum floods.” And *“Though there may be a multitude of sins concealed beneath the pat phrase ‘engineering judgment,’ a glaring one is the obscuring of the probabilistic framework of flood hazard evaluation.”*

Bob, a Bayesian at heart, writes that *“The uncertainty is often underestimated and what is in effect a ‘guesstimate,’ or in terms of probability theory a ‘degree of belief,’ is often stated as fact.”* Kates describes an engineering calculation of the 1,000 year flood on Big Creek that, in large round numbers, is one and a half times the *maximum probable* flood calculated by another source, concluding that

“While it is human to play it safe and overbuild, a more precise statement of such humanity might be desired.”

That “more precise statement of humanity” comes in another chapter; back to the floodplain residents: *“Disturbing for game theory constructions is the finding that some men play not to win but because they like the game or they ignore outcomes that appear threatening to them.”* The farmer judging her prospects in the face of uncertain climate, or of the IPCC findings about climate change, comes to my mind. Bob goes on to write:

“For some, either by ignorance or the denial of the common shared experience, floods do not exist at all. For others, floods do not occur as repetitive events but as true acts of God and are not subject to the ken of man....If they have pondered their future personal relationship to a potential hazard, it is only then to shrug it off. They have but pondered one more of life’s many imponderables.”

Like, maybe, sea level in 2099.

With this great scholar and champion of better adjustment to natural hazards now gone, I wonder where my sandbags got off to?

William Riebsame Travis

A “Katesian Three” things to do:

Ask big questions

Always have a project going

Build bridges

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