Book Review


Expanding his similarly titled 2004 essay published in *Science*, Paul Edwards shows how a mid-nineteenth century vision of a vast global weather observing system evolved into a twentieth century reality. His analysis describes how twentieth century scientists measured and collected data across time and space, standardized and translated the data, and ultimately forecasted and modeled the global atmosphere. As we quickly discover, the answer is complex; Edward’s protagonists were embedded in a highly unstable and contingent Cold War world that constantly threatened their ambitions to develop what he calls “infrastructural globalism.”

What is this form of globalism? As he explains, the twentieth century marked a transition from voluntarist internationalism, based on a temporary confluence of shared interests, to a quasi-obligatory globalism based a permanent shared infrastructure. This latter form of globalism was not based on ideology or principal but rather a “structured, goal-directed, long-term practice to build a world-spanning network” (p. 25) The result: a “vast machine,” or a “socio-technical system that collects data, models physical processes, tests theories, and ultimately generates a widely shared understanding of climate and climate change” (p. 8). While demanding, Edwards’ definitions provide a very useful conceptual model to understand this evolution. Three themes are among those that Edwards uses to showcase the inherent complexities: (1) the human/technology relationship, (2) the nature of uncertainty in late twentieth century climate change debates, and (3) the role of the Cold War in limiting, or promoting, global infrastructural development.

First, it is indisputable that digital computers revolutionized both weather forecasting and climate modeling in the second half of the twentieth century. Even so, Edwards shows how the integration of technology was not immediate or linear. For instance, while the use of numerical weather prediction (NWP) provided measured improvement over subjective “human” methods, its implementation “did not lead
instantaneously to better forecasts; in fact, initially the opposite was true” (p. 132). Indeed, a strong acceptance of numerical modeling occurred only after a consensus of newly-trained theorists, albeit with great risk to professional reputations, shifted their attention to the potential of electronic digital computers. Edwards does not profess an anti-technology sentiment, but rather challenges the belief that technology is so simply and immediately integrated into human affairs.

Second, Edwards shows that climate models are trustworthy producers of knowledge, in spite of embedded uncertainties. While acknowledging that uncertainty has led to “heightened suspicion, confusion, and above all friction, potentially slowing the production of stable climate knowledge and damaging its credibility,” he takes a very clear stance against contrarian voices (p. 398). The fact, he asserts, is that “there are too many models, there are too many controls on the data, too much scrutiny of every possibility, and there is too much integrity in the IPCC process” for the climate consensus to be wrong: “the facts of global warming are unequivocally supported by the climate knowledge infrastructure” (p. 429).

Third, the emergence of the World Meteorological Organizations (WMO) posed significant challenges for the development of infrastructural globalism. The problem was this: to acquire global knowledge, scientists had to acquire global data. But, scientists did not live in a vacuum: they had to (1) orchestrate the inclusion of communist, non-communist, and even newly created nation-states, and (2) work within the boundaries of national sovereignty. Fundamentally, how did unstable voluntarist internationalism evolve into permanent infrastructural globalism? The answer: design a system that maximized national sovereignty while making withdrawal difficult and costly. The use of language, as Edward’s nicely shows, was vital to balancing the authority of the WMO and national sovereignty.

While hesitant to see the WMO as a state-builder, Edwards nonetheless argues that “the organization did help to construct a broad international community of civil servants, science and technology administrators, scientists, and engineers who carried the banner of their native countries” (p. 201). Provocatively, he sees the development of infrastructural globalism as a Cold War remedy: it was an “effective and important strategy for reducing Cold War tensions, binding the superpowers through common projects, involving their allies, and generating both rhetorics and realities of global data collection” (p. 226).

Edwards’ book nicely complements a growing litany of scholarship, including the work of Kristine Harper (Weather by the Numbers), Erik
Conway, and Naomi Oreskes (*Merchants of Doubt*), among many others. Similar to his earlier work, *A Closed World: Computers and the Politics of Discourse in Cold War America*, Edwards provides a smooth weaving of geopolitical factors into the fabric of his narrative and highlights the multi-layered contingencies that constantly shaped decision-making.

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