System and Interdisciplinarity in Historical Perspective

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Reviews in American History, Volume 44, Number 3, September 2016, pp. 498-504 (Review)

Published by Johns Hopkins University Press

DOI: 10.1353/rah.2016.0067

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For those concerned with the history of the construction of knowledge in the human sciences in the United States, these two books will be essential reading. While Hunter Heyck deals with the emergence of “high modern social science” and its transformation into “late modern social science” during the post-World War II period and after, Harvey J. Graff examines interdisciplinary endeavors in the social sciences, the life sciences, and related fields during the twentieth century. The books intersect in significant ways; both are concerned with interdisciplinary initiatives and with high modern social sciences such as cognitive science and social relations. Most importantly, both shed considerable light on the construction of the human sciences during the twentieth (and early twenty-first) century and, in doing so, make major contributions to illuminating the intellectual terrain that we now inhabit.

As indicated above, Hunter Heyck’s Age of System will be essential reading for those interested in the history of the human sciences in the late twentieth century. Part of a group of historians concerned with the history of the social sciences in the U.S. during the postwar era—Mark Solovey, Joel Isaac, David Engerman, Sonja Amadae, Nadine Weidman, Marga Vicedo, and Jeff Pooley come to mind as other members of this group—Heyck has previously distinguished himself as the author of an intellectual biography of Herbert Simon, a pioneer social scientist and administrator during the postwar years. In Age of System, Heyck provides us with an insightful and erudite historical account of what he terms “high modern social science,” examining its emergence in light of the wider intellectual, social, technological, and organizational trends from the 1950s to the early 1970s. Given its ambitious scope, his book can,
with some justification, be seen as a sequel to Dorothy Ross’ treatment of the emergence and consolidation of modern social science in her *The Origins of American Social Science* (1991); Heyck describes his book as a “prequel” to Daniel Rodgers’ examination of late modern social science (and other intellectual trends) in *Age of Fracture* (2011).

Heyck sees high modern social science as an “instantiation” of the “bureaucratic worldview.” The bureaucratic worldview envisioned societies, organisms, human-constructed cybernetic devices, and even aspects of the world of inanimate matter and energy as complex, hierarchical systems, which—at least in the case of organisms and of human beings and the organizations and systems created by them—were characterized by purposeful, adaptive behavior. The human sciences based on the bureaucratic worldview attempted to formulate models of these complex, hierarchical systems and utilized formal languages and sets of symbols, especially mathematics, in order to do so.

Associated with the bureaucratic worldview underpinning the postwar human sciences were the following features: a “behavioral-functional” approach to the properties of systems geared toward coordinating and maintaining equilibrium within these systems; an orientation toward instrumental reason; a concept of “universal man”; an emphasis on communication and information; an “analytic realism” that embraced “the use of mental constructs to describe systems of often intangible but very functional relationships” (p. 11); and a “weak holism” stressing the manner in which the higher levels of organizations coordinated and unified their components. The bureaucratic worldview came to pervade the human sciences during the postwar era—as the cognitive approach triumphed in psychology, “macroeconomics” in economics, the “behavioral revolution” in political science, and structural-functional approaches in the disciplines of sociology and anthropology. Practitioners of the new social (and cybernetic) sciences included such important figures as Talcott Parsons, Clyde Kluckhohn, George Miller, Jerome Bruner, Paul Samuelson, A. F. C. Wallace, David Easton, Herbert Simon, Walt W. Rostow, and Norbert Wiener.

In *Age of System*, Heyck situates the emergence of high modern social science within wider historical currents and contexts, including those relevant to the history of technology. The bureaucratic worldview that inspired high modern social science was spawned in large part by the ongoing “organizational revolution,” which had its roots in the late nineteenth century with the emergence of large-scale business enterprises and other bureaucratic endeavors. The organizational revolution continued during the twentieth century and was given new impetus by the New Deal, World War II, and the Cold War. In the postwar era, it included not only the expansion of corporate organizations but government-sponsored “technosocial” projects such as the creation of the nuclear-armed defense system, the pursuit of the space race, and the construction of the federal highway system in the 1950s. A slew of
managers, engineers, technicians, and scientists were engaged in these projects. The development of new control technologies also played a major role in fostering the ongoing organizational revolution. The telegraph, telephone, and eventually the computer and the internet facilitated communication and coordination within organizations, thus enhancing their capacity to function as unified, integrated systems. Furthermore—and directly relevant, according to Heyck, to the advent of high modern social science—control technologies “provided a set of tangible models of the intangible structures of the world,” and many of these technologies proved “useful not only as heuristic models of nature but also as concrete instruments for investigating, representing, or controlling it” (pp. 4–5).

In addition to the ongoing organizational revolution and the development of control technologies, patronage from both foundation and government sources played a major role in the emergence and elaboration of high modern social science. While the foundations, especially the Rockefeller philanthropies, had played a key role in funding social science research in the prewar era, during the postwar period, military and civilian government agencies entered the arena. Federally funded military research agencies, including the Office of Naval Research, RAND, the Air Force Office of Scientific Research, and several Army research units, came to sponsor important social science projects. Civilian government agencies, especially the National Science Foundation (NSF) and the National Institutes of Health (NIH), also funded social science research. To be sure, the foundations continued to play a major role in sponsoring research. During the 1950s, the Ford Foundation, with its Behavioral Sciences program, became a key sponsor of social science research. Powerful managers and brokers of research affiliated with these agencies and organizations—such as Herbert Simon, Rowan Gaither, Clyde Kluckhohn, Robert K. Merton, and Paul Lazarfeld—encouraged “research that was mathematical, behavioral-functional, problem-centered, and interdisciplinary” (p. 62); they dubbed the social sciences then being developed the “behavioral sciences.” They also encouraged the utilization of formal models, and, most significantly, the creation of interdisciplinary, problem-oriented research teams.

Instructively, Heyck argues that there actually existed two systems of patronage during the postwar era. The first, which involved the agencies and organizations mentioned above, prevailed in the 1950s and well into the 1960s; it served to formulate and consolidate high modern social science. Under this system, major interdisciplinary research programs and organizations such as Harvard’s Department of Social Relations, Herbert Simon’s Graduate School of Industrial Administration at Carnegie Tech, and Michigan’s Institute for Social Research flourished, becoming important centers of high modern social science. Under the second system, however, high modern social science began to fracture. Starting in 1958 and accelerating in the mid-1960s, such
federal agencies as the NSF, NIH, and the National Institute of Mental Health (NIMH) came to channel increasing levels of funding into projects aimed at methodological innovations within specific disciplines, bypassing the brokers who had encouraged interdisciplinary research projects under the previous system. Under the second system, Heyck argues, interdisciplinary centers and projects floundered, unless they found ways of redefining themselves by embracing special resources, techniques, or technologies.

High modern social science and the bureaucratic worldview closely associated with it exerted a major influence during the postwar years—one that went well beyond academia. Politicians and formulators of government policy as well as business executives were very much under the sway of the findings and practices of high modern social science, while ordinary citizens absorbed its perspectives in college courses and other venues. By the mid-1970s, however, high modern social science had begun to fracture. This was due in great part to the onset of disillusionment during this period with bureaucratic projects and ventures, such as attempts to “modernize” Third World countries and to implement Keynesian policies. Moreover, as mentioned above, the second patronage system played an important role in fragmenting the social sciences.

Accompanying the fracturing of high modern social science and the emergence of late modern social science were significant conceptual and theoretical developments. These included the shift from a focus on system to one on ideas such as choice, contingency, and networks; from hierarchical organization to chaos and complexity; from stability resulting from continuous management to “flexibility and the spontaneous production of order from disorder” (pp. 16–17). Distrust for collective, organized action became widespread, while neoliberal economic policies were increasingly adopted. Heyck concludes his book by commenting: “The world built on the logic of structure and system and the world built on the logic of contingency and choice are different worlds. Today we are at home in neither. It is time to build anew” (p. 205).

Heyck might have done more on the transition from modern social science to high modern social science and, most crucially, from high modern social science to late modern social science. With regard to the latter transition, Heyck acknowledges that high modern social science was characterized by “deep tensions,” and, in various sections of his book, he examines some of the important factors that led to its fracture in the 1970s. These include, as we have seen, the impact of the second patronage system as well as of the multiple crises of the Seventies that discredited the bureaucratic worldview intimately associated with high modern social science. Still, the book could benefit from a more systematic and detailed treatment of the causes of the fracture of high modern social science and the emergence of late modern social science, especially as this set of issues is of such urgent concern to us today.
Harvey J. Graff’s *Undisciplining Knowledge: Interdisciplinarity in the Twentieth Century* represents a major contribution to the historical study of the construction of interdisciplinary knowledge in the human sciences. Covering the period from the formation of the modern research university in the United States in the late nineteenth century to the early twenty-first century, Graff—a distinguished historian of literacy studies, urban studies, and the study of families, children, and youth—examines the development of interdisciplinarity and its interaction with disciplinarity in a number of diverse fields. Each chapter in Graff’s book offers an in-depth comparison of case studies of two contrasting fields. These pairings include genetic biology and sociology; communication and the humanities; social relations (as elaborated in the Harvard Department of Social Relations) and operations research; cognitive science and the “new histories” (see below for more on these fields); materials science (particularly nanotechnology) and cultural studies; and bioscience (especially molecular biology) and literacy studies. Others, most notably Julie Thompson Klein, have studied interdisciplinarity in some depth, but Graff’s comparative case-study approach yields especially penetrating insights into the varied trajectories of interdisciplinary endeavors in the United States.

Graff notes that the term “interdisciplinary” has been frequently bandied about by university administrators and others aspiring to gain prominence and/or funding for their institutions through seemingly interdisciplinary efforts. However, what actually constitutes interdisciplinarity has generally gone undefined. In an effort to remedy this situation, Graff explains that “interdisciplinarity is defined and constructed by questions and problems of theory or practice, knowledge or conditions of living, and the means developed to answer those questions in new and different ways. Interdisciplines are fashioned from elements of different disciplines to form distinct approaches, understandings, or contexts” (p. 5). Graff argues that the histories of disciplinarity and interdisciplinarity have been intertwined and inseparable; since the rise of the modern research university, both disciplines and interdisciplines emerged in tandem. Moreover, various fields followed their own path in their efforts at interdisciplinarity; large-scale, well-funded “big science” projects should not be taken as providing the norms for interdisciplinarity and its development. As Graff stresses: “There is no single path to interdisciplinarity, no single model, no single standard for successful development. The process and results vary across disciplines and clusters. Like disciplines, interdisciplines are diverse in paths, locations, relationships to disciplines, organization and institutionalization” (p. 5).

Readers of this review essay, especially those concerned with the history of the American social sciences, will probably find Graff’s chapter dealing with cognitive science and the new histories—and with the comparison of the two fields—to be the most engaging and challenging part of the book. For those
readers, the case study of the new histories will be of special interest not only because of the historical issues and problems raised, but because of the influence of the various social sciences on the new histories. Moreover, the case study of cognitive science should take on special significance for readers, given the substantial and pervasive influence of this field in academia today. Furthermore, readers might note that Graff’s treatment of the emergence and elaboration of cognitive science (a key branch of what Heyck has described as high modern social science) as well as Graff’s account of the development and proliferation of the new histories (associated, in a sense, with the rise of what Heyck has dubbed late modern social science) intersect with important themes that are dealt with in the Heyck book. While cognitive science is concerned with the processing and communication of information (a central characteristic of high modern social science, according to Heyck), the new histories, in Graff’s account, have developed within the context of flexible networks—a key issue for late modern social science.

Both cognitive science and the new histories, Graff explains, were elaborated in the United States during the post–World War II era—cognitive science during the 1950s and later; the new histories, starting in the 1960s. Both fields constituted revolts of sorts against the reigning orthodoxies of the disciplines in which they were initially elaborated: against behaviorism in psychology (for cognitive science) and against conventional narratives of the political activities and intellectual formulations of elites within the discipline of history (for the new histories). Most importantly, the two fields both aspired to indisciplinarity. Indeed, the aims of cognitive science with respect to this goal were especially ambitious; according to Graff, it set itself up as “the apotheosis of interdisciplinarity” (p. 124). Instructively, Graff argues that cognitive science and the new histories achieved different degrees of success with regard to the attainment of interdisciplinarity. Graff believes that cognitive science, for all its well-funded programs and centers and all the talk of the advent of the “cognitive revolution,” was never really able to get much beyond simply listing its constituent disciplines. Characterized by competition between rival disciplines, cognitive science was unable to achieve integration and focus on common problems, and thus it was unable to attain interdisciplinarity in more than a superficial sense. The new histories, on the other hand, were able to achieve, in spite of their tendency to fragment and proliferate, a certain sense of limited but, for Graff, fertile interdisciplinarity; to be sure, they developed interdisciplinarity within one discipline—history—and never achieved the funding or prominence of cognitive science. But notwithstanding their different degrees and kinds of success, Graff notes that both cognitive science and the new histories were concerned with a set of closely related phenomena: cognition and the “level of representation” for cognitive science; mentalities, attitudes, values, and the “lived experience” of ordinary people (or of particular groups of people) for the new histories.
Graff examines in some detail the manner in which the new histories developed within the flexible networks fostered by the Social Science History Association (SSHA). Established in 1976, the SSHA was originally oriented toward the quantitative, social scientific version of the new social history, but it eventually came to house networks embracing a variety of topics, methodologies, and theoretical perspectives. Within these networks, dialogue among scholars with varied disciplinary concerns and affiliations proceeded on a relatively informal and egalitarian basis, with little regard for rigid disciplinary boundaries or hierarchies. For Graff, the networks of the SSHA “reveal the possibilities and the limits of interdisciplinarity developing within a discipline” (p. 174). While most participants in the networks were affiliated with history departments, their discussions went well beyond narrow disciplinary concerns and boundaries. Graff succinctly sums up his comparison of the new histories to cognitive science in these words: “Admitting my own biases and the many contradictions within the new histories, I think that history and the social sciences have been more capacious homes for interdisciplinary work than the competing sciences that hosted cognitive science” (p. 174).

Packed with detailed information and assessments of a number of quite diverse disciplines, with long quotations and sometimes abstruse and difficult passages, Graff’s book is not an easy read. Moreover, readers may find themselves disagreeing with his critical assessments of interdisciplinarity (or the lack thereof) and its consequences for various fields. Nevertheless, the book offers ample rewards for those concerned with interdisciplinarity in historical perspective.

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