THE DYNAMICS OF UNCERTAINTY

THE UNCERTAIN SCIENCES. By Bruce Mazlish. New Haven: Yale University Press, 1998. Pp.vii, 328.

I. THE HUMAN SCIENCES AND HISTORY

Simultaneously stunned and captivated by the recent discoveries of the genomic sciences, our culture proceeds under the spell of what Jennifer Terry calls "the magic sign of the gene."¹ With an imminent transformation of human thought, action, and perhaps even morphology, scholars in the human (and social) sciences have reason to reflect deeply and critically on the status of their collective knowledge enterprise. The successes of the Human Genome Project and the rapidly cascading technological accomplishments enabled by those successes are beyond breathtaking; they are revolutionary, providing world-making facts about all life. What is more, these sciences, along with their adjacent technologies, are proving themselves capable of making new life-forms and, in so doing, becoming active participants in evolution.

In contrast, the human-science projects to understand human behavior and social structures (or produce a modicum of predictive knowledge or general knowledge for guiding social policy) appear quite simply inadequate; at best, they provide paltry replicas of the "real" thing, the natural sciences. The signifier of the gene, even while invisible to most but the immediate scientific witnesses, looms more real—both descriptively and prescriptively more real—in our present social vision than do complex constructs of the unconscious, quantitative analyses of dramatic shifts in income distribution, or ethnographies of teenage parenting. And if the eugenic aspirations accompanying this techno-scientific revolution, ambitions that historians have located at the core of the American genetic sciences, are realized, then the very project of human science—from the very assumptions about personhood to refined methodologies—must be drastically revised. In fact, the objectives and possibilities of the human sciences as we know them would require reconstruction; indeed, one wonders whether they would even be necessary.

The specter of a revolutionary biology altering everything in its wake, together with an appreciation of what now appears to be the transformative as well as predictive powers of reductionist determinism, obviously is not the only impetus behind the multiplying historical assessments of the modern human sciences.

^{1.} Jennifer Terry, "The Seductive Power of Science in the Making of Deviant Subjectivity," in *Science and Homosexualities*, ed. V. A. Rossario (New York: Routledge, 1996), 271.

The labyrinthine development of the human sciences over the last century also has inspired historical reflections, as has natural science's maturation and disciplinary expansion to encompass various facets of the human sciences. As a synthetic, philosophical, and historical inquiry "into the conditions of the human sciences-accomplishments, weaknesses, and possibilities" (1), The Uncertain Sciences takes a place in a growing library of studies on the historical conditions of the human sciences. The escalating interest in the history of the human sciences is seen in the establishment of specialized journals such as History of the Human Sciences, and even further in specialized journals such as History of Psychology and History of Sociology as well as learned societies in Europe and North America. Edited volumes such as Dorothy Ross's The Origins of American Social Science, and Joanne Brown and David K. Van Keuren's The Estate of Social Knowledge, for example, represent steps to coordinate and integrate historical investigations across the various human sciences.² Add to these a daunting number of monographs that examine case studies, specific human-science objects or methodologies, and transdisciplinary connections of theory or practice. These histories are diverse, including, for instance, such varied projects as Theodore Porter's history of statistics in the modern human sciences, Trust in *Numbers*; Ellen Herman's study of the expansion of psychological thinking into social policy and international relations after the Second World War, The Romance of Psychology; and Anson Rabinbach's multi-sited study of the metaphor of the motor in understanding work in the twentieth century, The Human Motor.³ Such historical ventures share the vantage point of certain triumphs of the human sciences, thereupon appraising past work from the purchase of professionalized sciences with their institutionalized methods, discourses, and disciplinary boundaries. Yet they impart, too, appreciation of the vulnerability of these sciences, and are ever conscious of persistent uncertainties-which become particularly salient, even glaring, whenever the human sciences are compared with the natural sciences (which, as is the case of genetics, periodically appear ready to appropriate the human sciences' mission).

While locating his book alongside these histories, Bruce Mazlish distinguishes his historical project from the others, characterizing it as one aimed not only at appraising the sciences' accomplishments but more directly and immediately at proposing means to intervene into the human sciences. His simultaneously descriptive and prescriptive inquiry is aimed at "synthesis" (2). Mazlish raises three questions to frame his synthetic appraisal: "I deal with the question What sort of knowledge do the human sciences claim to be offering? To what extent can that kind of knowledge be called scientific? And What do we mean by 'sci-

^{2.} Dorothy Ross, *The Origins of American Social Science* (Cambridge, Eng.: Cambridge University Press, 1990); *The Estate of Social Knowledge*, ed. Joanne Brown and David K. Van Keuren (Baltimore: Johns Hopkins University Press, 1991).

^{3.} Theodore Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton: Princeton University Press, 1995); Ellen Herman, *The Romance of American Psychology* (Berkeley: University of California Press, 1995); Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley: University of California Press, 1990).

entific' in such a context?" (1). Mazlish's ultimate objective is "to seek to contribute, however modestly, to changing the way we think about the subject." Mazlish's answers to his three questions constitute the basic material for changing how he thinks we ought to appraise and, indeed, practice the human sciences.

Despite his ambitious goal to intervene in the project that is the human sciences, Mazlish knowingly eschews several investigative tasks, and omits some subject matter normally considered components of histories of the human and social sciences. First, while drawing upon various intellectual figures to exemplify the accomplishments of a particular period or discipline, Mazlish informs readers that he waived comprehensive exposition of individuals' works in order to construct a synthetic historical account. Second, to further his goal a full chronicle of the formation of disciplines across the human sciences is sacrificed. Third, some disciplines associated with the human sciences, notably linguistics, semiotics, philology, and aesthetics, are omitted. Fourth among the book's forfeitures in the name of synthetic breadth is attention to a number of consequential subjects in the human sciences. Among these exclusions are women, gender, and race in addition to "problems of war, poverty, pollution, the negative effects of globalization and capitalism, the commercialization of culture, the destructive tendencies of science and technology-in short, the darker side of much of contemporary life" (5). Finally, Mazlish eschews detailed engagement with postmodernism, noting the prevalent postmodern hostility to the idea of science and the compromises ensuing from entering into the conversational terms set by postmodernism. Possibly with regard to such a range of omissions, The Uncertain Sciences is described as an "extended essay, not a monograph," and readers are alerted that "Perhaps a sign should have been posted on the title page: Warning! This Book is Not a Traditional Account!" (5).

It is not in waiving historical conventions or excluding significant subjects, however, that Mazlish flouts tradition, but in his fusing of philosophical and historical analyses to generate concrete prescriptions for the human sciences and, more radically, in maintaining that neither historical nor philosophical analysis is compromised in the merger. This merger of history and philosophy is not a completely open conjoining, but is boldly framed by an epistemic position qua quest: the book's primary aim is to seek "the very possibility of knowledge in the human sciences, especially scientific knowledge" (5). Better human sciences, in other words, are ones producing "scientific" knowledge. Two principal theses guide this prescriptive enterprise, and the greater part of The Uncertain Sciences is dedicated to describing and demonstrating these theses. First, success in the human sciences is held to depend on the development of consciousness, a thesis that in its full form draws upon specific notions of investigative communities, the scientific method, and the inextricably reflexive properties of the human sciences. The second thesis follows from the first: the human sciences are emergent knowledge-forms wherein vital intellectual changes result from significant transformations in the objects of human science, societies themselves.

The first of these theses-the connection between the human sciences and consciousness—receives most attention and, consequently, occupies the greater portion of the book. Mazlish begins his analysis of the development of the human sciences by probing the historical and philosophical grounds upon which we assess development or progress. He uses the assumed aims of science as the metric for this assessment but, in so doing, cautiously asserts a critical difference between the natural and human sciences: the human sciences possess a unique complication due to the unavoidable circumstance that the observer is part of what is being observed. One significant consequence of this scientific complication is psychological: "When the human ethnographer is himself part of what is observed-both in terms of his awareness of self and the other's awareness of him—his confidence erodes" (15). This complication, however, does not mean that the human sciences need abandon conventional scientific aims; in fact, Mazlish deploys these very aims to assess the "problem" of the human sciences. In so doing Mazlish does not assume that what constitutes science is fixed and clear; indeed he asserts that

There is neither an ur-model of science nor a Platonic idea, nor, in the case of the human sciences, a history that suffices. There is only the human attempt to understand the natural and social environment in ways that come to be considered scientific and that eventually adhere to acceptable criteria for collecting and weighing of evidence, validating procedures, making testable predictions where feasible, verifying results, and so forth, by an agreed-upon scientific community. (15-16)

Here Mazlish self-consciously takes a philosophical purchase, forgoing historicist mandates to examine what has counted as "science" at particular moments. In so doing, he situates the problems of the human sciences in the emerging aims of science more generally, in attempts at understanding, prediction, prescription, control, and accumulation.

The problem of understanding in the human sciences is contained in the question of what these sciences are trying to understand: is their aim to know human nature, societal functioning, human consciousness, or social change? The difficulty confronted in the aim of prediction is larger, tied to the overarching issue of scientific determinism. Yet despite its magnitude, the problem of determinism is quite simple: "if humans know how they are supposed to behave, they may behave otherwise" (17). Given inevitable indeterminism in human action, the aim of prescription likewise becomes problematic. The very description of social conditions functions as a prescription (for example, describing the conditions of capitalism prescribes a utility-maximizing agent), or description functions as a "self-fulfilling prophecy" (for example, characterizing women's achievement motivation as inherently low influences their subsequent performances). Prescriptions also can flounder on unconscious processes and on the human propensity for behaviors that are "erratic, inconsistent, changeable, and even perverse" (19). The scientific aim of control is troubled by these same sorts of human complications: to the extent that control relies on prediction, it is limited by the indeterminism of human action; the extent to which control depends upon imposing discipline through social policies, it represents "ideology rather than real knowledge" (21). Finally, the human sciences face the problem of accumulation—the ability of a science to fashion stackable building blocks of valid knowledge.

While his thesis about the development of consciousness is intimated in this review of the "problems" of the human sciences, the thesis is explicated in what Mazlish identifies as the three major preconditions that "helped establish the prerequisites for the unfolding of the human sciences" (27). These preconditions encompass the Age of Discovery, which enabled scrutiny of the "Other" and ultimately new awareness of ourselves; the Age of Reason, which ushered in the scientific revolution and which made possible the subsequent extension of its methods to the human sciences; and the Age of Darwin, which extended the scientific approach by its multiple applications to understanding humanity.

Just as the choice of these three preconditions indicates the author's epistemological and theoretical commitments, so it signals certain notable omissions. Not included among the central preconditions is the formation of distinct disciplines and the lines of authority served through these disciplines. Also excluded from this list is the establishment of theoretical and epistemic boundaries that determined the limits of how human nature could be described. Many of these boundary conditions were set in terms of binary relations: other and self (addressed by Mazlish) can be seen as one of these sets; yet also to be included are human/machine (discussed briefly), human/non-human, nature/culture, objective/subjective, male/female, rational/non-rational, emotional/cognitive, individual/society, and fact/value, among others. Although these boundary conditions cannot be identified with some specific time, say the Age of Reason, or with a particular enterprise, and although they remain negotiable terms, they were necessary to the project of adapting scientific method to the study of humans. Mazlish's list of preconditions also excludes politics and moral missions, despite the fact that the human sciences are deeply grounded in expectations about social order, citizenship, and individuality. Note in particular that making evolutionary theory a precondition, and not a product or outcome, of the human sciences, has the effect of devaluing if not "naturalizing" the boundary conditions and moral projects which undergird the human sciences. I will discuss some of the implications of these selections for inclusion and exclusion in a later section.

The details surrounding the development of human consciousness are laid out in four sequential chapters on positivism, the human species, hermeneutics, and the accomplishments of the human sciences. Once again, Mazlish begins with a reminder of the remedial, philosophical objectives guiding his narrative, stating that he chose the historical cases with "an eye to what can be extracted from them in order to enhance our understanding of the possibility of any human science and to give us an idea of the shape it might or should take" (37). A loosely woven chronicle of the development of positivism, including occasional erroneous uses of that philosophical doctrine in the human sciences, moves toward extracting an

essence of positivism that can profitably guide human-science research. This distillation is all about method, especially a scientific method that, although it might have failed in particular extensions to human affairs, nevertheless is superior in its "democratic" community of witnesses and collectively regulated but revisable investigative practices. These practices, or scientific method, "can be defined, at a minimum, as being based on the willingness of witnesses to accept public forms of verified experience, acceptable means of logical thinking, and a code by which theory and data can be related and played back against one another" (65).

Mazlish locates the major attribute of hermeneutic inquiry in the checks and balances that interpretive methods provide for positivist scientific method. That is, interpretive inquiry generates more complex, if sometimes conflicting, interpretations, thereby supplying variety and depth of understanding, where positivism furnishes only generalizations.

To understand the formative growth of the human sciences, however, requires more than tracing the maturation of methods and theories; the consciousness required for scientific pursuits first must materialize. Mazlish broaches his thesis about the emergence of human consciousness by sketching large-scale changes in culture, including "the development of certain language forms, symbolic manipulations, technological developments, and social interactions, to name a few of the constituent elements" (74). These cultural formations present new forms of understanding that induce the emergence of new practices and self-understandings. The developed awareness that human beings are a part of the natural world (and, hence, accessible to systematic study) is one such emergent phenomenon. However, such developed consciousness is a social construction requiring a community of knowers-a process of cultural evolution separate from the processes of biological evolution but similarly dependent on the variables of populations, stratification, and classification. The new understandings demanded by such emerging phenomena ultimately spawned the human sciences, a strong causal relation implying that "there can be no economic science until a market economy has emerged. There can be no sociology until the concept of society emerges out of the changing forms of human cohabitation, as in the shift from the feudal to the industrial" (75). In turn, the human sciences, born of emergent phenomena and themselves entering that reproductive network, generate new knowledge and understandings and thereby change consciousness as well as actions. The result of this scarcely two-century-old-network is "breathtaking" transformation: realizing that humans can be objects of scientific study, and making them such objects through the very creation of the human sciences, constitutes a revolutionary change in consciousness—in human perspective-taking.

In tracing these revolutionary transformations, *The Uncertain Sciences* attends to the stages of human-scientific regard of the human self, including the changing regard of the "other," as a central feature of that scientific work. In this progression of self-consciousness through the human sciences, Mazlish finds the need to address not a failure to produce "certain" knowledge but failure to "incorporate such knowledge into our behaviors and beliefs" (133). Relatively

satisfied with the eventual depictions of self, and self-consciousness about depictions of the "other," he laments that the accumulated knowledge of the human sciences "is little acted upon consciously, in acknowledged fashion, by the great masses of people" (133). This observation seems to interrupt Mazlish's otherwise largely smooth depiction of the evolution of consciousness; indeed, his noting of stunted consciousness disrupts if not counters the book's two primary theses intended to explain the construction and functions of the human sciences (on emergent phenomena, and on the development of consciousness).

More consistent with these two theses is his subsequent consideration of "inadvertent consequences" in the dynamic loop of consciousness development and emergent phenomena. Changes in cultural processes, comprised of a multitude of individual decisions and actions, give rise to unintended consequences. The human sciences, as a form of consciousness, intervene through their scientific plan to understand these consequences: "With intentions understood, we can glimpse the way the interaction of heterogeneous intended actions produced an outcome-which we can analyze by at least semipositivst methods-unintended by any of the parties to the event. Such knowledge, in turn, has the potential for informing our future intentions by providing a foreknowledge of possible outcomes" (180). Thus, unintended consequences bring about emergent phenomena, creating "a form of cultural accumulation" (181). (Note that Mazlish also recognizes the limits of human science in this regard. In this dynamic relation-the looping of practices, consciousness, and scientific interrogations-the human sciences will always and inevitably contain degrees of uncertainty: the human sciences "seek to understand, in a scientific manner, the phenomena that have produced them. Humans cannot jump over their own shadow. We cannot, I am suggesting, truly evaluate the prospects of the human sciences because we cannot foresee with any certainty the future of the human species" (184). Moreover, the prescriptions of the human sciences necessarily undermine the conditions of their efficacy, since "any law in the social sciences is part of a process including prescriptions that fosters change, which may then create new conditions in which that law no longer effectively applies" (189). The very scientific shortcomings of the human sciences are, at least in part, constituted by their very success.)

By incorporating human consciousness and inadvertent consequences in the larger scientific venture of the human sciences, Mazlish intimates that the scientific community is comprised of all humanity. However, such a postulate is, according to Mazlish, both utopian and untenable, and Habermas's problematic notion of a truth community is presented as an example of such unfeasibility. Instead, the scientific community of the human sciences can be better considered in terms of historical or "accumulated consciousness" (218) whose developing awareness of self and society, along with the unconscious incorporation of the results of scientific method, can achieve understanding and ascertain its values. More specifically, this special or higher "consciousness can be envisioned as supplying the sort of scientific community whose lack keeps the human sciences from being solidly scientific. Consciousness is, ideally, always being constituted and

judged in terms of scientific method, although that hardly composes the whole of its content . . ." (218). Such historical consciousness demands participation; on this fact rests the fate of the human sciences, for "human beings cannot share in such a consciousness without entering into it, even if unconsciously or half-consciously. In the end, this is the true dilemma of the human sciences" (232).

II. THE LOOPING OF SCIENCE AND CULTURE

With sensational tensions, transformative successes, egregious errors, and constant replenishment of ideas about what it means to be human, not to mention an oddly endearing vulnerability in the face of the natural sciences, the human sciences beckon historical analysis. The Uncertain Sciences furnishes an exhilarating history of the enterprise, offering a narrative that seduces us with the promises of romance still unconsummated, while at the same time generously if painstakingly imparting a sense that there is some overarching order in the social world and our knowledge of that world. The project invites a view of a larger landscape of the past but commends such viewing less for its gaze into that past than for its better visions into the future. Another inclusive history of the human sciences, published within a year of The Uncertain Sciences, is Roger Smith's The Norton History of the Human Sciences.⁴ Appearing as near-perfect counterpoint, Smith's history unfolds through the premise of the fundamental diversity of the human sciences, whereas Mazlish's query seeks to uncover the unified scientific nature of the human sciences and their accomplishments. Smith admits the controversies, ambiguities, paradoxes, and diversity of the human sciences, proposing that "We need the history of this diversity of belief about human nature to give us the expressive and imaginative life to create our own beliefs. In fact, there is no choice: if we do not do it consciously, we will assuredly do it together unconsciously."5 Differing notably in their comprehension of the kind of knowledge the human sciences do and should comprise, the authors nevertheless both discern the dynamic relations between the human sciences and the currents of social life. They both hold that, in Smith's words, "we cannot know, even ourselves, except in terms that we acquire through living in a particular time and place," and that "since ordinary people provided these sciences with their subject matter, the human sciences existed in a circle of interactions between science and ordinary life, a circle in which they influenced and were influenced by popular culture." ⁶ But Smith's romance replaces the promise of better science or some meta-unification of the human sciences with the plentiful opportunities for personhood and social life afforded by varied perspectives in the human sciences. Given the dynamic interdependence of the human sciences and human actions,

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^{4.} Roger Smith, *The Norton History of the Human Sciences* (New York: W. W. Norton & Company, 1997).

^{5.} *Ibid.*, 34. 6. *Ibid.*, 22.

"We may suspect that unity in the human sciences would become possible only if people were to lead a uniform life."⁷

In some serious sense these two projects are not comparable, for Smith's over 1,000-page history is committed to detailed contextual analyses, approximating an inclusive survey of the modern human sciences. Nevertheless, both Smith and Mazlish focus on the emergent, reflexive, and mobile characteristics of the human sciences, and this distinguishes their projects from the conventions of history-writing on the human sciences. In writing histories that do not simply situate particular human-science productions within their broader cultural contexts, but instead take those very cultural events and beliefs to be constitutive of that human science, Mazlish and Smith join with a small but growing number of scholars who are forging dynamic historical models of the human sciences. Such historical accounts challenge the conventional boundaries between social reality and accounts of social reality, scientific knowing and popular knowing, knowledge and culture, and the real and nominal. In so doing, they wholeheartedly acknowledge, yet take a theoretical step beyond, Anthony Giddens's "doublehermeneutic" notion that describes how social scientists must necessarily commence their scientific examinations with everyday, cultural interpretations of the object to be studied and at the completion of their investigations must return an interpretation of that object to that larger cultural community.⁸ Many of these dynamic history projects share with Mazlish at least two aspirations: to historicize human experience (or consciousness), and to find a route beyond the apparent yet irksome impasses posed by the debates between constructivism and positivism (or naïve realism). All of them refuse to privilege internalist accounts of the history of the human sciences; they reject presentist narratives that record notable discoveries and theories that presumably, through subsequent accumulation, give rise to currently prevailing theories or perspectives.

Dynamic history models introduce something of a feedback system, or what Ian Hacking calls "looping" of human kinds, wherein palpable conditions in the human world are given representation in scientific theories and, over time, these representations come to change those very human conditions. As Hacking describes the circuit,

To create new ways of classifying people is also to change how we can think of ourselves, to change our sense of self-worth, even how we remember our own past. This in turn generates a looping effect, because people of the kind behave differently and so are different. That is to say the kind changes, and so there is new causal knowledge to be gained and perhaps, old causal knowledge to be jettisoned.⁹

Feedback models like Hacking's have been influenced by Foucault, principally in their understanding of the human sciences as resulting from or responding to changes in the social world. Such a looping model displaces—or more appropri-

^{7.} Ibid.

^{8.} Anthony Giddens, The Constitution of Society (Berkeley: University of California Press, 1984).

^{9.} Ian Hacking, "The Looping Effects of Human Kinds," in *Causal Cognition: A Multidisciplinary Debate* (Oxford: Clarendon Press, 1995), 369.

ately, replaces—the classic tension in human-science discourse between notions of the materiality of experience and the social production of experiences and actions. Hacking's "dynamic nominalism" claims "not that there was a kind of person who came increasingly to be recognized by bureaucrats or by students of human nature, but rather that a kind of person came into being at the same time as the kind itself was being invented."¹⁰

In probing the ultimately, and inescapably, prescriptive or generative outcomes of so-called "descriptive" research in the psychological sciences, Alasdair MacIntyre notes that it is not only self-consciousness that is altered, but also awareness of others and, hence, the totality of social relations. Human sciences such as psychology urge individuals to understand others in new ways, involving not merely empathy but also the notion that "to understand the other is to perceive in him or her more and other than he or she perceives and acknowledges. The project of understanding comes to involve discrediting the surface appearances."¹¹ Psychological sciences, therefore, not only must proceed with changing phenomena, including consciousness itself, but also must heed the effects of their very methods and experimental accounts of the phenomena they study.

Few studies to date undertake comprehensive analysis of the full circuit of the historical kinetics linking theory, culture, and consciousness. Foucault's work has influenced numerous investigations of the human sciences' emergence from large-scale shifts in political and social infrastructures. Such investigations have, for instance, connected twentieth-century conceptions of the self as autonomous and disciplined with modern conditions of labor and consumption in post-industrial society.¹² More difficult than demonstrating the material and cultural conditions that gave rise to particular human-science enterprises, however, is registering subsequent changes in consciousness or awareness. Hacking's history of multiple personality attempts to document just such a linkage, and largely succeeds in locating concrete changes in the actions and self-understandings of people diagnosed with multiple personality disorder (now called dissociative disorder).¹³ Take another example: in charting the multiple partners and diverse interests guiding the scientific investigations of premenstrual syndrome (PMS), Mary Brown Parlee has traced the causal lines of such looping, as well as inadvertent consequences of the scientific research itself.¹⁴

10. Ian Hacking, "Making Up People," in *Reconstructing Individualism: Autonomy, Individuality, and the Self in Western Thought*, ed. T. C. Heller, M. Sosna, and D. Wellberry (Stanford: Stanford University Press, 1986), 228.

11. Alasdair MacIntyre, "How Psychology Makes Itself True or False," in *A Century of Psychology as Science*, ed. Sigmund Koch and David E. Leary (New York: McGraw-Hill, 1985), 900-901.

12. See, for example, Nikolas Rose, *The Psychological Complex: Psychology, Politics and Society in England 1869–1939* (London: Routledge & Kegan Paul, 1985); Philip Cushman, "Why the Self is Empty: Toward a Historically Situated Psychology," *American Psychologist* 45 (1990), 599-611.

13. Ian Hacking, *Rewriting the Soul: Multiple Personality and the Sciences of Memory* (Princeton: Princeton University Press, 1995).

14. Mary Brown Parlee, "The Social Construction of Premenstrual Syndrome: A Case Study of Scientific Discourse as Cultural Contestation," in *The Good Body: Asceticism in Contemporary Culture*, ed. Mary G. Winkler and Letha B. Cole (New Haven: Yale University Press, 1994).

Although figuring only generally in Mazlish's model of emergence and the human sciences, human scientists themselves afford an especially accessible object through which to trace the dynamic relation of science, culture, and consciousness. The analyst in the human sciences is not prior to or privileged over the analyzed persons; both have bounded possibilities for self-awareness that are enabled and circumscribed by cultural conditions, social and material. Both sorts of persons can seize their possibilities; indeed, through critical self-awareness, they can resist, revolt, or otherwise change course. From a historical perspective, however, analysts are of less interest for their innovative acts of resistance or emergence than they are informative by virtue of their position in the looping of self-understandings. The analyst is both crucial to and reflective of transformations of self-understandings and self-classifications. Thus, for example, the design of a theory of behavior that was non-reductive (to biology), and a correspondingly behaviorist scientific method (of which vestiges remain in psychology), were fashioned in response to worries about relations among scientists both within and across disciplines.¹⁵ The introduction of statistical tools in psychology was originally motivated by a perceived need for psychologists to resolve doubts about their own inference processes. In what may stand as a micro-example of emergence and looping, these statistical tools eventually were extended directly if metaphorically to new theories of mind as computer, particularly to depicting mental processes as statistical ones. In this case, ordinary consciousness of the analysts gave rise to adopting new technical routines which, in turn, enabled emergent ideas of mind as a computational mechanism.¹⁶ The introduction and use of the rat as an experimental animal also involved the importation of surplus meaning not only of what was taken as the essence of rats' psychology (filth, danger, disease, and darkness)-and humans'-but also the very activity of science itself. While emblematic of modernity's annihilation of deprivation and danger, both psychology and psychoanalysis "educated" the rat through scientific theorizing and experimenting, notably through manipulation and control.¹⁷

Studies such as these suggest some of the ways that human scientists and their investigative practices comprise a critical force in the field of consciousness and culture. The norms and requirements of scientific practices, from what counts as adequate theory and valid data to the systems of meaning-making (and importing of meanings), function sometimes even inadvertently and unconsciously to produce certain actions of human kinds. Science, then, is a human practice, and the human experiment is one kind of social situation; these human practices proceed *within* the circuitry of the human sciences. Drawing examples from psychology to a certain extent magnifies and temporally shortens the kind of reflexive processes that Mazlish connects with the human sciences and emergent con-

15. Jill G. Morawski, "Organizing Knowledge and Behavior at Yale's Institute of Human Relations," *Isis* 77 (1985), 219-242.

16. Gerd Gigerenzer, "From Tools to Theories: A Heuristic of Discovery in Cognitive Psychology," *Psychological Review* 98 (1991), 254-267.

17. Fred J. Wertz, "Of Rats and Psychologists: A Study of the History and Meaning of Science," *Theory & Psychology* 4 (1994), 165-197.

sciousness. Yet, examples from psychology are not different in kind from those that can be located in other human sciences, and they permit, in great part by virtue of their use of laboratory experiments and the heightened control and power enabled in experiments, an understanding of scientific practices as not quite innocently, but not quite deviously, involved in producing consciousness. If these scientific sites of knowing and acting go unacknowledged and are bracketed from inclusion in models of human-science developments, then perhaps here—and not just in the larger cultural realm of knowing and believing—we have failed to acknowledge the fuller accomplishments of our self studies.

Underestimating this site of transactions, moreover, curtails critical appreciation of how the human sciences have generated and reproduced certain conceptions of human nature (and neglected others). As noted, The Uncertain Sciences, with its focus on the development of scientific method and the emerging regard of humans as appropriate objects of study, leaves in abeyance the varied yet often monumental ideas about human nature that were articulated, measured, and legitimated in the human sciences. Little attention is given, for instance, to mechanical, rational, biological, or empiricist models of human nature, and left aside are the antinomial conceptions routinely if often tacitly deployed in such modelsthe aforementioned binaries of nature/nurture, emotional/cognitive, male/female, moral/factual, normal/pathological, equality/difference, and so on. Through the advanced operations of scientific method such models are validated, binary understandings are rehearsed and repeated, and certain kinds of persons (kinds rendered "different" by race, gender, ethnicity, age, class) are conceived. Thus, for example, the introduction of statistics into the human sciences not only provided an elegant instrument befitting the scientific method, ensuring accuracy through quantification while enabling nomothetic knowledge, but also enabled certain conceptions of human nature-and eliminated others-to be advanced. Statistics at once standardized the observer and a certain form of objectivity (notably the mechanical control of subjectivity and taming of chance) and also reconfigured individuals and societies in accordance with administrative interests as well as the demands of precise measurement. Assessments supplied by statistics helped produce categories such as wealth and poverty, health and illness, intelligence, intoxication, and consumer satisfaction; such categories powerfully configure humans and human nature.¹⁸

In the end, although Mazlish adopts a dynamic systems approach to the history of the human sciences and admits the possible interventions of the scientific process itself, he emphatically fixes on the initial inputs, emerging consciousness, and final outputs, the accomplishments attained by using a mature scientific method. He notes, too, some instances where scientific ideas about human nature (such as the idea of mechanical man) can effect transformations in human consciousness (184-187). However, fixing on base inputs and polished outputs

^{18.} See Porter, *Trust in Numbers*; Kurt Danziger, *Constructing the Subject: Historical Origins of Psychological Research* (Cambridge, Eng.: Cambridge University Press, 1990); *The Empire of Chance: How Probability Changed Science and Everyday Life*, ed. Gerd Gigerenzer (Cambridge, Eng.: Cambridge University Press, 1989).

obscures all sort of human actions and reactions — transformations, mergers, conflicts, resistances, ambivalences, repetitions, mimeses, repressions and their return, enlightenments, and refusals. For example, the more recent proposed use of genetics to alter humans augurs transformations of human nature of far different scope than the modifications of consciousness afforded by transfigurations of market economy or mechanical man. The book's foci obscure several constitutive features of the human sciences. Notable among these hidden features are the forces acting upon the human sciences to confect knowledge that serves the administration of humans and social institutions; the innumerable intermediary processes within scientific practices, including forms of meaning structuring that knowledge; and the multi-dynamic effects of human-science knowledge.¹⁹

III. SCIENCE ISN'T STRAIGHT UP

The Uncertain Sciences does not analyze investigative practices but, instead, reserves a special place for scientific method. Although this method is understood to be modifiable over time, it somehow evolves outside historical processes, comprising almost an emergent phenomenon with a life of its own. Science is unified through the scientific method, which in turn is defined "at a minimum, as being based on the willingness of witnesses to accept public forms of verified experience, acceptable means of logical thinking, and a code by which theory and data can be related and played back against one another" (65). This method forms "the binding force holding together the members of a scientific community, which, in turn, is what makes possible the reception and acceptance of any real science" (197). Thus, the scientific community generates truth statements through rational methods. The main problem of science, according to Mazlish, lies not with its own emergent forms of knowing or the particular renditions of human nature produced through those forms. Rather, the problem of science entails ascertaining precisely how the scientific community is constituted in the human sciences.

Given Mazlish's commitment to a stand-alone science, or a science straight up much as it is depicted in science textbooks, and given the absence of any detailed attention to the scientists of the human sciences, how does he account for the analyst and analytic situations, namely, concrete scientific practices? Are cases such as those cited above instances of poor science or not so self-aware reflexivity? Or are they inconsequential noise in the machinery of scientific method? How are they to be appraised? To position science and scientific practitioners in a special place, substantial faith must be placed not just generally in the scientific method but also specifically in objectivity as a unique practice within that method. On numerous occasions, Mazlish acknowledges that science and objectivity are themselves emergent phenomena, that objectivity conceived of as "disembodied, purely rational witness" is impossible, and that objectivity is a

19. The last of these three analytic approaches to the history of the human sciences is highlighted in this review; however, substantial historical work has been committed to the other two approaches.

"human aspiration, fitfully approximated and always subject to criticism and renewed witnessing" (193). Nevertheless, his argument depends upon the possibility and efficaciousness of striving for some "ideal" of objectivity, for that ideal is core to the emergence of scientific knowing: "Objectivity, however unreachable as a totality in practice, sits well with the public nature of scientific method. In contrast to private experiences, . . . human scientific experiences are public, and their results demonstrable, with relevant facts and explanations available for proof and rational testing" (200).

Setting aside for the moment the matter of feasibility, the notion of objectivity as even an "ideal" position of observation from some site outside the observer's position contradicts the theoretical parameters set by a dynamic model of doing, sensing, and knowing. Eschewing this irreconcilable problem—essentially failing to acknowledge what Steve Woolgar describes as the "horrors of reflexivity"—produces at least two notable consequences: it blinds us to instances in which ideology is produced under the banner of science, and it prevents us from full appreciation of science's manifold potential.²⁰ What I propose here is not that the situation of human-science analysts and their practices are somehow central, or that they reveal some generative human process not found elsewhere in the social world. Nor do I suggest that conceptualizing science as special necessarily disguises ideology as science. Rather, a model of the history of sciences, or what more accurately can be called a model of "historical human sciences," that brackets (and thus privileges) the scientific method inevitably cannot let us see well either the "worst" or the "best" of human-science discoveries.

A final historical example from the psychological sciences intimates the screens erected when the scientific method is privileged and the ideal of objectivity, however qualified, is sustained. Early in his career, Robert Yerkes conceived of an anthropoid research station where scientists could perform crucial experiments on consciousness that could not be undertaken with human subjects. The "uninhibited" chimpanzee would reveal much of what is unconsciously, subconsciously, or even consciously concealed by humans. Realizing his aspiration in what remains today a premiere primate research center, Yerkes and his coworkers conducted innovative, methodologically sophisticated experiments. One such study, of dominance in conjugal relations (observed in food getting behaviors), revealed that in the absence of any aberrational personality trait, male chimpanzees are "naturally" dominant. Males and females also were found to react differently to social controls such that "the male characteristically demands, commands, and as necessary physically imposes his will, unless he be the subordinate mate, whereas the female cajoles, requests, begs, and as necessary uses to achieve her aims various forms of sexual allure, physical play, and petting."²¹ Ruth Herschberger, a sociologist, responded to the published scientific account,

20. Steve Woolgar, Science: The Very Idea (New York: Tavistock, 1988).

21. Robert M. Yerkes, "Social Behavior of Chimpanzees: Dominance between Mates, in Relation to Sexual Status," *Journal of Comparative Psychology 30* (1940), 186. For a fuller of account of the primate research station and its studies see Robert M. Yerkes, *Chimpanzees: A Laboratory Colony* (New Haven: Yale University Press, 1943).

sending Yerkes several questions about the study's semantics and interpretation. In his written response, Yerkes conceded certain problems with some of the terminology (such as the word "naturally") but maintained that a more accurate description would be boring to readers.²² Several years later Herschberger published a book containing a chapter written in the voice of Josie, one of Yerkes' chimpanzee subjects. Josie provided an impressive list of methodological problems in the study, criticized the "uncaged primates" use of language, and ardently asserted that their interpretation of primate behavior was wrong. Her indignant critique amused as it informed, claiming, among other things, that humans just do not know how to enjoy sex: "No matter what names you humans give to things, we chimpanzees go right on enjoying life. It isn't so with humans, and that's why I feel so sorry for women. The names you uncaged primates give things affect your attitude forever after."²³

The conjugal relations experiment demonstrates how even the most "scientific" of scientific methods, the state-of-the-art controlled experiment, manifested something different than an "approximation" of objectivity, to use Mazlish's terms. Using elaborate methods of observation, Yerkes and his colleagues deployed an objectivity that mirrored their own corporate (competitive and hierarchical) and patriarchal (scientific as well as everyday) culture. Further, the research served as a forum for negotiating what counts as "nature"—biological, innate, determined—and culture—duplicitous, superficial, structured by nature; it supplied material for defining what counts as "human nature" or personhood. These terms of human nature were negotiated publicly, yet aside from a fictional criticism in the voice of a chimp, that public knowledge stood publicly uncontested. The scientific community utilizing these objective techniques was, indeed, "democratic," but no more so than the culture that sponsored the science, and female human scientists struggled for nearly a century to gain full membership in that scientific community.²⁴

The experiment and Josie's story serve not as a demonstration of ideology masked as science that is at some point unmasked through more self-conscious objectivity. The case suggests other conclusions. First, these kinds of experimental negotiations of human "nature," specifically those revealing the "nature" of

22. Ruth Herschberger to Robert Yerkes, March 2, 1944; Robert Yerkes to Ruth Herschberger, Robert M. Yerkes Papers, Sterling Library, Yale University. See Jill G. Morawski, "Impossible Experiments and Practical Constructions: The Social Bases of Psychologists' Work," in *The Rise of Experimentation in American Psychology*, ed. Jill G. Morawski (New Haven: Yale University Press, 1988), 72-93.

23. Ruth Herschberger, Adam's Rib (New York: Pellegrini and Cudahy, 1948), 11-12.

24. For historical studies of women's efforts to become members of the scientific communities in the natural, social, and human sciences see Margaret W. Rossiter, *Women Scientists in America:* Struggles and Strategies to 1940 (Baltimore: Johns Hopkins University Press, 1982), and *Women Scientists in America: Before Affirmative Action, 1940–1972* (Baltimore: Johns Hopkins University Press, 1995); Rosalind Rosenberg, *Beyond Separate Spheres: Intellectual Roots of Modern Feminism* (New Haven: Yale University Press, 1982); Elizabeth Scarborough and Laurel Furumoto, *Untold Lives: The First Generation of American Women Psychologists* (New York: Columbia University Press, 1987). For an account of women in primatology see Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989).

men and women, continue in relatively similar—stunningly unself-conscious and unrevised—form, most notably in the new evolutionary psychology. In their perpetuation, such scientific narratives seem immune from the criticisms that presumably would be the rational consequence of an emerging historical consciousness. The impulses behind these seemingly unresponsive continuations, along with their apparent immunity from self-consciousness, warrant historical scrutiny.

Second and far more importantly, while unaltered by their performers, these sorts of experiments have contributed over time to wholly different outcomes: revolts against classical ideas of scientific community, especially the notion of objectivity. Critical regard of these scientific practices has prompted resistance and counter-sciences, thus obviously complicating a progressive story of science as rationality and accumulated consciousness. In significant ways, the eventual admission of women into the scientific community has led to alternative understandings of primate behavior and, consequently, human behavior. What can be called, in the spirit of this review, the "emerging consciousness" of womenfeminist consciousness-has yielded radical reworking of scientific objectivity. These new understandings of objectivity do not accord with the "ideal" of objectivity as "a human aspiration, fitfully approximated and always subject to criticism and renewed witnessing" (193). Instead, critical and self-conscious reassessments have found objectivity itself to be of a particular human cloth, one fitted to masculine form and temperament. In so seeking to comprehend the root of the "ideal" of objectivity-that abstracted, perfect if unachievable observational perspective-feminist scientists, philosophers, and historians work not toward dismantling science but toward fashioning a democratic conception of knowing in which objectivity bears little resemblance to its traditional ideals.²⁵ These new ventures of a repopulated and dramatically different public of science are the sort of emergent scientific practice that is omitted from an exceptionalist conception of science. Neither the worst nor best of science is discernible when science is defined as somehow uniquely rational and objective, as an abstracted ideal to which workers aspire. Such exceptionalism at once obscures the ways that science can participate in the construction and maintenance of ideology; it likewise under-appreciates how science can contribute to fundamental transformations of consciousness, or how science itself can be subjected to transvaluation or substantial reconfiguration.

The science depicted and idealized in The *Uncertain Sciences* is juxtaposed to fantasy, ecstasy, anxiety, and irrationality (215-217). Yet, such seemingly unproblematic juxtapositions would be considerably more difficult to make in a more

^{25.} For historical perspectives on the gender dynamics of objectivity, and some philosophical projects to reconfigure objectivity, see Susan Bordo, *The Flight to Objectivity: Essays on Cartesianism and Culture* (Albany: State University of New York Press, 1987); Evelyn Fox Keller, *Reflections on Gender and Science* (New Haven: Yale University Press, 1985); Sandra Harding, *The Science Question in Feminism* (Ithaca, NY: Cornell University Press, 1986) and *Whose Science? Whose Knowledge? Thinking from Women's Lives* (Ithaca, N.Y.: Cornell University Press, 1991); Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14 (1988), 575-599.

inclusive historical survey of the human sciences. The necessity of selectivity in any history aspiring to philosophical synthesis is understandable. However, if the sorts of exclusions from the book were to be added to its narrative frame, then the original claims about scientific method, scientific community, and objectivity would be challenged and, consequently, would require substantial modification. For example, by largely omitting issues of race, women, and gender along with the "darker side of humanity" (5)—including war, poverty, and other destructive inventions and practices—significant forces of consciousness are left unrecorded. Omitting such movements of culture and of consciousness also truncates the narrative of how the human sciences have fared, what they have accomplished, and whom they have served and for what purposes.

IV. REFLEXIVE HUMAN SCIENCES

Viewing science within the dynamics of the real makes possible more accurate and comprehensive historical analysis of the human sciences, and permits better scientific understandings of what it means to be human. Conceptualized as a more directly and fully engaged partner in the emergence of consciousness and the evolution of culture, the human sciences might not provide exactly what Mazlish seeks. To recall, his desired aim is humanity's ultimate resemblance to the scientific community: "Understanding interacts with unintended consequences and forms the phenomena that the human sciences attempt to comprehend. In this strange, uncertain, and unexpected manner, humanity begins to resemble a scientific community adequate to the demands placed upon it by the nature of the human sciences" (228). Certainly not to be realized in the alternative idea of a participating, reflexive human science that this review recommends is the aspiration of the concluding lines of The Uncertain Sciences, that humans seek understanding of human nature "especially through the self-abnegation and self-emancipation to be found in science" (235). A genuinely reflexive human science, ever self-conscious of its situated and contingent status, would find selfabnegation to be a peculiar fantasy, and self-emancipation to be understood not as freeing self from self (Mazlish's ideal form of objectivity) but a complicated, transfiguring task. A reflexive human science would have to engage, in its epistemology as well as its working conceptions of what it is to be human, the diversity, ambivalence, pluralities, and apparent contradictions of human actions.

This alternative route to the human sciences is much messier and even more uncertain than the human sciences portrayed in *The Uncertain Sciences*. By acknowledging diversity or pluralism, and by realizing that the human sciences offer no refuge from the kinetics and ambiguities of human nature, we can seriously entertain John Dupre's case for an epistemology of "promiscuous realism."²⁶ By acknowledging the inextricably human nature of the human sciences, we can begin to comprehend the inescapable presence of the normative—of politics in its

^{26.} John Dupre, *The Disorder of Things: Metaphysical Foundations of the Disunity of Science* (Cambridge, Mass.: Harvard University Press, 1993).

broadest sense—in human-science ventures. One useful starting point could be to heed Paul Feyerabend's observation that the special status of science, particularly that of unified science, is more useful for "*people doing science*" than for the public.²⁷ Or perhaps, in taking seriously the social relations of analyst and the analyzed, the relations of self and other, new scientific methods can be invented.²⁸ As Donna Haraway argues, once we are "no longer able to sustain the fictions of being either subjects or objects, all the partners in the potent conversations that constitute nature must find new ground for making meanings together."²⁹

Taking the human sciences to be genuinely reflexive, diverse, and messy does not imply that science ought to be jettisoned; only through some misguided execution does that epistemic stance lead to relativism or some postmodern malaise. As Joseph Rouse presents feminist science scholars who are seeking new versions of science and objectivity, these scholars value scientific knowledge; however, they assume that "knowledge is neither external to nor merely instrumental for justice, but is itself a valued end for which justice is integral."³⁰ This assumption complicates the relatively direct causal chain connecting science and humanity imagined by Mazlish.

The Uncertain Sciences provides undeniable evidence of the dynamics and multi-causal relations of culture, consciousness, and the human sciences: it offers a framework for tracing some of the major cultural phenomena that made possible the rise of the modern human sciences, and contributes to an emerging understanding of the human sciences as more than intellectual ventures. But its provocative notions of scientific method, evolution, and historical consciousness do not go far enough. Mazlish insufficiently attends to the complexities of the relations of science and the human world, and consequently to the reflexivity of the human sciences and the far-reaching implications of this reflexivity.

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27. Paul Feyerabend, *Conquest of Abundance: A Tale of Abstraction versus the Richness of Being*, ed. Bert Terpstra (Chicago: University of Chicago Press, 1999).

28. In psychology, numerous methodological and theoretical alternatives have been proposed. For instance, Edward Sampson has proposed that research "subjects" become full participants in ascertaining and collecting the "inputs" or data of research, and Robert Wicklund has suggested that the "professional person-perceiver" abandon his or her distanced, controlling stance. Edward E. Sampson, "The Democratization of Psychology," *Theory & Psychology* 1 (1991), 275-298; Robert A. Wicklund, "Multiple Perspectives in Person Perception and Theorizing," *Theory & Psychology* 9 (1999), 667-678.

29. Donna Haraway, "Otherworldly Conversations, Terran Topics, Local Terms," Science as Culture 3 (1992), 65.

30. Joseph Rouse, "Feminism and the Social Construction of Scientific Knowledge," in *Feminism*, *Science*, and the Philosophy of Science, ed. L. H. Nelson and J. Nelson (London: Kluwer, 1996), 208.