

Cultural Studies of Science

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'Cultural studies of science' marks a loosely amalgamated, multidisciplinary research field drawing from history, anthropology, feminist theory, sociology, and philosophy of science. Its participants emphasize that scientific practices are historically situated, meaningful patterns of interaction with the world. Cultural studies offer an interpretive, critical engagement with scientific practices, rather than an explanation of their outcome. Cultural studies are situated within the "cultures of science" that they investigate, and are responsive to what is at stake in the ongoing development of scientific practices.

Cultural studies of science first emerged in the late 1980's and early 1990's in response to debates between proponents of internalist history and philosophy of science, and adherents of the "Strong Programme" in the sociology of science. These debates concerned how best to explain the content of scientific knowledge, either by appeal to rational norms or as the outcome of particular social interactions. The stakes in these debates over explanatory strategies seemed to concern the authority of scientific claims, their relation to the natural world, and the normative stance of the explanation itself. With respect to scientific authority, philosophical accounts typically vindicated the acceptance of scientific claims or research programs as rationally warranted or reliable, whereas constructivist sociological work emphasized the contingency of scientific work and the impossibility of rationally foreclosing alternative interpretations. Meanwhile, scientific realists argued that scientific claims were accountable to the world as independent of human language, experience, or social practice, while antirealists (including both sociological constructivists and philosophical empiricists and historical rationalists) insisted that the sciences could never reach beyond our categories, practices, and norms. Finally, classically normative accounts of science aspired to assess the adequacy of scientific practices according to philosophical norms, while philosophical and sociological naturalists proposed primarily to describe (and perhaps explain) how the sciences actually proceed.

Work in cultural studies proceeded differently, in ways that rejected assumptions shared by most participants in these debates between internalists and social constructivists (assumptions that are also implicit in classic works of social history, such as Forman 1971 or Shapin and Schaffer 1985, that are otherwise thematically congenial to cultural studies). First, cultural studies are strongly antiessentialist about the sciences: there are no goals, methods, products, or norms belonging to science as such. Such antiessentialism undercuts the explanatory projects of both internalist philosophical histories and of a programmatic social constructivism, which are committed to accounting for the sciences as knowledge-producing activities (where "knowledge" is a distinctive kind of product, either rationally warranted, causally reliable, or socially authoritative belief). The sciences are historically evolving practices, such that past and present practice cannot fix their nature, significance, aim, or "content".

Cultural studies also find no clear boundaries between scientific content and its social context. In recent decades, both philosophers and sociologists have identified the shared commitments and norms of scientific communities as the locus of their divergent explanatory projects. Cultural studies have instead emphasized both an "internal" heterogeneity that belies any presumption of community within a scientific field, and an active traffic in meanings and material across any supposed boundaries between scientific communities and their social or cultural contexts. This absence of community-defining consensus also exemplifies a more fundamental issue: cultural studies take the subjectivity of scientific knowers to be part of what

needs to be understood rather than as an explanatory resource. Neither the natural body, the rational faculties, nor the social identity of a scientist can be taken for granted as the locus or source of agency and belief. Prosthetic embodiments, narrative reenactments, discursive interactions, and the affordances of material surroundings instead constitute knowing subjects through scientific practices, rather than accounting for practices as the doings of human agents/believers.

The opposing positions in the realism debates thereby dissolve. The question whether human knowers can ever get beyond the confines of their mental or social representations in order to be accountable to natural objects presupposes the autonomous intelligibility of mental or social representations. Cultural studies take scientific practices to be always already materially engaged and discursively articulated, so that there is no confinement within experience, language, theory, or social world to be transcended. On the contrary, experience, language, theory and social forms themselves only take on determinate form through ongoing patterns of “intra-action” in the material world (Barad 1996 coins this term to avoid the connotation that ‘interactions’ involve agencies definable apart from their interaction). But the same is true of “nature,” whose objects and capacities only acquire determinate articulation in phenomena, ongoing patterns of “material-semiotic” intra-action (Barad 1996, Rouse 1996, Haraway 1999).

The dispute between normative and naturalistic (descriptive) approaches to scientific practices also turns out to share false presuppositions. Cultural studies agree with naturalists that there can be no standpoint “outside” of ongoing scientific practices from which to articulate norms to which they are accountable. Yet they disagree that science studies must therefore simply describe (and perhaps explain) the norms that function within those practices. The normative accountability of scientific practices is not a determinate fact or regularity about them (or about scientific “communities”), but is instead constitutive of their intelligibility to practitioners and interpreters alike. Scientific practices only make sense in terms of what is at issue and at stake in those practices. Yet these issues and stakes are themselves contested within the practice, and its interpretation. Cultural studies are not neutral descriptions of what scientists do, but interpretive construals of those doings that may thereby partially reshape the field of subsequent practice. In that respect, cultural studies are continuous with scientific work, which likewise reinterprets what is at issue and at stake through reenacting the practices it participates in (Rouse 1996).

Cultural studies thereby articulate dynamic, expressive conceptions of meaning, knowledge, and power, which contrast sharply with the standard approaches to these phenomena within philosophy and social theory (Rouse 1996, 1999). On such accounts, meaning is not a property of utterances or actions; the term ‘meaning’ instead articulates the ways in which such performances inferentially draw upon and transform the field of prior performances in which they are situated. Knowledge is likewise not a theoretically coherent kind of representation; the term ‘know’ is used expressively in ongoing practices of assessing, attributing, relying upon, and contesting understanding and justification. Power in turn is not a substantial component of social interaction, something possessed and exercised by some agents, and lacking for others. The term expresses the ways in which one action aligns with others over time to affect the field of subsequent possible activity: ‘power’ articulates the connections between causal efficacy and intelligibility. Cultural studies of science thus expressively articulate the semantic, epistemic,

and effective roles of scientific practices.

The preceding account offers a broadly philosophical interpretation of the aims and commitments embodied in the wide range of historical, anthropological, and sociological investigations that exemplify cultural studies of science. Typically, however, these commitments are expressed through detailed studies of particular practices, performances, or institutions rather than as explicit philosophical theses. A representative list of prominent work in cultural studies of science would include work directed toward particular laboratories, field sites, and other settings (e.g., Haraway 1989, Heath 1996, Trawick 1992, Biagioli 1993), images, models, and metaphors (e.g., Bono 1995, Haraway 1992, Keller 1992, Martin 1994, Daston and Park 1998), and machines and procedures (e.g., Barad 1999, Galison 1997, Rheinberger 1997, Daston and Galison 1992), all of which involve patterns of exchange between scientific settings and other sites of meaning-articulation. These topics have been marked as productive foci of inquiry not because they are relatively localized or self-contained, however, but because they have been productive nodes in the circulation and transformation of meaning, knowledge and power around potent and often contested issues.

“The body” has been among the most prominent of these issues taken up in detailed work by cultural studies scholars, perhaps in part because of their insistence upon the embodied, materially interactive dimension of scientific practices. Attention has been directed toward bodily disciplines and skills (both as constitutive of scientific knowing, and as impositions upon who or what is to be known); toward prosthetic extension or reorganization of bodily engagement with the world (including the immunological internalization of the boundary between bodily self and external others); toward bodies as raced and gendered, and otherwise differentially marked (Heath 1996, for example, takes up the distinctive bodily markings and significations of Marfan’s Syndrome); toward animal bodies, microbial “bodies,” and their complex material-semiotic relations with human embodiment; and toward various processes and apparatuses of bodily reproduction. Along with “the body,” other meanings partially constitutive of scientific knowing have also become issues for cultural studies of science. Authorship and authority, objectivity in its multiple contested deployments, the construction of professional and disciplinary identities within and around the sciences, and the affective dimensions of scientific understanding (e.g., wonder, anxiety, love, empathy, and various forms of humor) have been among the epistemically significant issues that have provided a focus for cultural studies of science. Cultural studies have also been attentive to many of the ways in which the objects of scientific understanding have been meaningfully articulated. Genes, organisms, cyborgs, blood, information, life, matter, viruses, origins, secrets, foundations, environment, and ultimately nature in its significant differentiation from culture, society, artifact, and history have been prominent themes in both scientific practices and cultural studies of science.

In rejecting global legitimations or critiques of science as justified knowledge, social consensus, empirically reliable methods, cultural tradition, or approximately true theories, cultural studies of science have attempted to set aside the project of accounting for what science really (essentially) is, or how science is actually done, in favor of participatory engagement with specific scientific practices. The sciences are not regarded as optional practices (or belief-systems), of which it could even make sense to be for or against, credulous or skeptical, as a whole. Scientific practices are integral to the formation of a field of intelligible possibilities for

action and self-understanding, partially constitutive of any conceptualization of who we are and what our situation is. To engage successfully in cultural studies of science is to clarify, and thereby partially transform, that field of possibilities and our involvement within it. Ultimately, the stakes in cultural studies of science are located in the notion of responsibility. To whom, to what, and in which respects are the sciences and science and technology studies responsible? How might such responsibility be exercised, and even partially fulfilled, through scientific research in particular settings, and through cultural studies of specific scientific or technological practices? What criteria or concerns should govern the assessment of responsible and irresponsible science and science studies? With these questions in mind, cultural studies become not simply a specifiable and in-principle-exhaustible domain of academic inquiry, but an ongoing project of responsible engagement within the cultures of science.

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