

Rethorizing Economic Geography: From the Quantitative Revolution to the “Cultural Turn”

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In this article, I reflect upon and attempt to understand the changing theoretical nature of post–World War II Anglo-American economic geography. In particular, I contrast the kind of theorizing that first occurred in the discipline during the 1950s with the very different kind now carried out under what has been called the “cultural turn” or the “new economic geography.” I argue that, during this transition, not only did the use of specific theories alter, but the very idea and practice of theorization also changed. I characterize the phases of this movement by using the terms “epistemological” and “hermeneutic theorizing,” defined on the basis of works by pragmatist philosopher Richard Rorty and science studies writer Donna Haraway. I argue that “epistemological theorizing” best describes the first period of theorization in the discipline around the quantitative revolution of the late 1950s and early 1960s, and that it is bound by the quest for accurate (mirror) representation. In contrast, hermeneutic theorizing describes the kind of theorizing found in the new economic geography, marked by an interpretive mode of inquiry that is reflexive, open-ended, and catholic in its theoretical sources. *Key Words:* economic geography, epistemology, hermeneutics, theorization.

Toto, I have a feeling we're not in Kansas any more.

—Dorothy in *The Wizard of Oz* (1939)

In September 1955, Brian Berry (1993, 435; 1995) left England, where he was a student at University College London (UCL), for graduate school in America. He traveled by boat (the *Queen Mary*) and by train (the *Empire Builder*) and carried in his baggage “a well-thumbed” copy of *The Economics of Location* by German economist August Lösch (1954), translated into English the year before.¹ By the time he arrived in Seattle to begin his graduate studies with William Garrison and Edward Ullman at the Department of Geography, University of Washington, Berry had read Lösch’s book and become convinced by its theoretical sensibility. That sensibility later made Berry’s name, and, as Ian Burton (1963, 151) put it, produced “a radical transformation in the spirit and purpose” of geography.

While this period of geography’s history is usually described as the quantitative revolution, the concurrent theoretical revolution was equally important, if not more so. This was the importance of Lösch’s book: it demonstrated that spatial economic phenomena could be expressed in an explicitly abstract, formal, and rationalist vocabulary and directly connected to the empirical world. I call this kind of theorizing “epistemological,” by which I mean the belief that the central task of theorizing is to develop abstract vocabularies that mirror—albeit

approximately—an external and independent reality. Such thinking was important because it introduced into Anglo-American economic geography for the first time the very idea of theorization. Until then, economic geography had been resolute in its atheoreticism. George Chisholm, author of the first English language economic geography textbook, *Commercial Geography* (1889), had even “wish[ed] . . . th[e] love of pure theory to the devil” (quoted in Wise 1975, 2; see also MacLean 1988). In this sense, Berry and others like him—with a little help from Lösch and other members of the German location school (Blaug 1979)—broke economic geography’s atheoretical mold.

Just over twenty years later, in September 1978, I also left UCL to begin graduate school in America, albeit in my case at the University of Minnesota.² Boarding a jumbo jet at Heathrow airport, I carried in my hand-luggage a book that Stephen Daniels, then a doctoral student at UCL, had said I must read and that had appeared at Dillons’ bookstore the week before: Derek Gregory’s (1978) *Ideology, Science, and Human Geography*. Reading Gregory’s book on the flight was a hard slog, and I barely cracked the first few pages before succumbing to free drinks and the in-flight movie. However, although I did not appreciate it at the time, Gregory’s book represented a different conception of theory than had been generally upheld hitherto, one that was later to affect economic geography.³ Gregory (1978) treated theory,

not as a mirror held up to the world, but as an interesting topic of conversation and discussion in its own right and one with practical consequences. I call this kind of theorizing “hermeneutic,” by which I mean it has an openness both to a wide range of theoretical sources and to the very definition of theory.⁴ It was one of the reasons that I found Gregory’s book so difficult to crack: I had not heard of most of the theorists that he discussed, and the theories themselves were outside of the hypothetico-deductive form into which I had been socialized as an undergraduate.

In this article, I elaborate on both stories in order to reflect upon and understand the changing theoretical nature of postwar Anglo-American economic geography. In particular, I contrast the kind of theorizing first occurring in the discipline during the 1950s with the very different kind now carried out by some economic geographers who are part of what is called the “cultural turn” (Crang 1997) or the “new economic geography” (Lee and Wills 1997, xv–xvi). In a series of monographs and collections over the last five years, writers have made a concerted attempt to remake economic geography (see, e.g., Hanson and Pratt 1995; Barnes 1996; Gibson-Graham 1996; Lee and Wills 1997; Leyshon and Thrift 1997; McDowell 1997; Schoenberger 1997; Miller et al. 1998). They have invoked new metaphors (e.g., “performance” in McDowell 1997, 23–36), new heroines and heroes (e.g., Judith Butler for Gibson-Graham 1996; Jacques Derrida for Barnes 1996), new theories (e.g., actor-network in Leyshon and Thrift 1997), new strategies of writing and even authorship (e.g., the merged identities of Gibson-Graham 1996), and new subject matter (e.g., bodily comportment in McDowell 1997). In the process, former iconic economic landscapes such as the Canadian prairie or the American Midwest have been replaced by radically different spaces: bodily spaces (McDowell 1997), textual spaces (Barnes 1996), virtual spaces (Leyshon and Thrift 1997). “We’re not in Kansas any more.”

Such a comparison exemplifies what I believe to be a significant shift in economic geography’s conception and practice of theory, which I will characterize as a move from epistemological to hermeneutic theorizing. This move does not involve merely exchanging one theory for another. Rather, the very idea of theory is transformed. This was the importance of Gregory’s book: it began to redefine theory. It said that theory did not have a single source, or possess only one form, or hold an exclusive truth; instead, it was much messier and sprawling, with no final, empirical means of proof. Even so, theoretical accounts could be persuasive and compelling, and could help to understand the world in new and revealing ways.

This new way of doing theory (and recognition of the “doing” was important, because it pointed to theorization as a specific kind of practical activity) subsequently burgeoned and developed. While now found in economic geography, it can also be seen in literary criticism (Culler 1997), psychology (Shotter 1993), and science studies (Hess 1997). The new theoretical practices of these different disciplines share a willingness to experiment by drawing upon and mingling works from outside the subject to which they are applied. As Culler (1997, 3; emphasis in original) puts it, “works regarded as theory *have effects* beyond their original field.”

This article is divided into three parts. First, I discuss what I mean by theory, and draw upon the works of Richard Rorty and Donna Haraway to identify two different types of theorizing, epistemological and hermeneutic. Second, using both secondary literature and a series of interviews with “pioneers” of the quantitative revolution,⁵ I argue that epistemological theorizing best characterizes the quantitative and theoretical revolution in geography in the late 1950s and early 1960s, which produced a distinctive vision of the discipline, both literally and metaphorically. Finally, I turn to the present period of the new economic geography and characterize it as a shift to hermeneutic theorizing.

At least two qualifications are in order. First, ever since Chisholm, economic geography has been a diverse discipline, accommodating a wide range of sometimes contradictory perspectives and substantive interests (Barnes 2000). As a result, although I use “economic geography” in the singular, I recognize its heterogeneity. I highlight the quantitative revolution and the cultural turn not because, in their periods, they constitute all of economic geography—this is clearly untrue—but because, as I will argue, they are central theoretical moments in its recent history. Of course, those moments have influenced human geography more widely, and it is possible this was the broader intent of their proponents. However, in this article I focus only on the impacts of such theorizing within economic geography. Similarly, by discussing only the quantitative revolution and the cultural turn, I do not derogate the significance of other theoretical approaches appearing in economic geography since the mid-1950s, such as Marxism or critical realism. However, this article is not a general history of the discipline. Rather, it presents an argument about the significance of only two theoretical instants within it.

Second, I draw a distinction between epistemology and hermeneutics in order to understand *ex post* the recent theoretical history of economic geography, not to denigrate one group from the perspective of the other. My sympathies certainly lie with hermeneutics, but I am

not blaming the pioneers of the quantitative revolution because they chose to focus on Von Thünen's crop circles rather than the hermeneutic circle. The achievement of Berry and others like him lay in introducing the very *idea* of theory. Without that prior accomplishment, critical and catalytic works such as Gregory's would have been inconceivable. As the American economist Paul Samuelson said about Robert Solow, "I come to praise him, not to bury him" (quoted in Harcourt 1972, 131).

Theory, Epistemology, and Hermeneutics

Theory

In the latest edition of *The Dictionary of Human Geography*, Ron Johnston (2000, 826) defines "theory" as "a set of connected statements used in explanation." I argue that such a definition is overly rigid and limited in its presumption that connections always exist among theoretical statements and that explanation is always the desired end. As a counterexample, consider Gibson-Graham's (1996, chapter 6) use of the rape metaphor to understand global capitalism, as well as to counter it. She (1996, 120) argues that globalization is often represented as ". . . the penetration (or imminent penetration) of capitalism into all processes of production, circulation and consumption, not only of commodities but also of meanings." "Where globalization is seen in terms of penetration, the parallels with rape are obvious" (Gibson-Graham 1996, 121, footnote 2). On the basis of Johnston's criteria, such parallels would not be sufficient to give Gibson-Graham's claim theoretical status, because she provides no logical relations, bridging rules, or empirically verifiable links that connect the terms of rape and globalization. Nor does she suggest that rape—even at a metaphorical level—explains global capitalism. Based on other criteria, however, Gibson-Graham's claim possesses all the attributes of a theory (Culler 1997, chapter 1). Like all theories, it is speculative, it attempts to denaturalize, it analogously relates processes occurring in one field to those occurring in another, and it tries to render opaque events and phenomena intelligible.

In this light, perhaps Jonathan Culler (1982, 1997) provides a more useful account of theorization. A literary critic, Culler is interested in the way his own discipline was transformed (like geography; see Natter and Jones 1993) from an atheoretical subject concerned with the interpretation of unique "great" texts to an intensely theoretical one. He suggests that such a transformation was achieved by theoretical redescription—that is, by expressing the subject matter at hand in terms of a new vo-

cabulary and syntax, where that vocabulary and syntax are drawn from an amalgam of disciplines outside of traditional literary studies, including, for example, psychology, philosophy, sociology, and political economy. For Culler (1997), their disciplinary "outsideness" makes such works theoretical.

To say that theoretical transformation is about mobilizing a new vocabulary and syntax does not mean that theory is only about words. Novel theoretical vocabularies infuse peoples' very beliefs and social practices. Along with theoretical redescriptions go practical effects such as changed views about the object of inquiry, altered practices of study, and the establishment of new social groupings and institutions (Culler 1997, 4). Culler (1982, 9) writes:

Theory is a genre because of the way its works function. . . . Th[os]e works . . . have had the power to make strange the familiar and to make readers conceive of their own thinking, behavior, and institutions in new ways. Though they may rely on familiar techniques of demonstration and arguments, their force comes—and this is what places them in the genre I am identifying—not from the accepted procedures of a particular discipline but from the persuasive novelty of their redescriptions.

Certainly, economic geography's postwar theoretical practices and the associated changes in behavior and institutions are bound up with the introduction of a series of persuasive, novel redescriptions. While some may see such borrowing of other discipline's ideas as a sign of weakness or a lack of originality, Culler's (1997) interpretation sees it as the reverse. Disciplines achieve theoretical maturity precisely through such borrowing.

William Wartz's introduction of the vocabulary of physics into economic geography during the 1950s provides an early example of this phenomenon. Describing places as points within a gravitational field produced—among other things—gravity and potential models, macrogeography, the social physics laboratory at Princeton, and collaboration between economic geographers, astronomers, and physicists (Wartz 1965). In another example nineteen years later, Doreen Massey used the geological lexicon of sedimentary layers of historically accreted industrial investment and social practice to describe economic regions, producing, in the U.K., the idea of spatial divisions of labor, the multicentered, multi-staffed, centrally funded locality project, and collaboration between economic geographers and sociologists (Massey 1984; Cooke 1989).

More generally, conceiving theorization within economic geography as acts of novel redescription is useful because it highlights the continuity of theoretical practice between seemingly different economic geographers,

such as Warntz and Massey or Berry and Gibson-Graham. All of them have the ability to effect persuasive and novel redescriptions. In addition, such a conception of theorization provides for an inclusiveness and open-mindedness about the definition of theory. While allowing for the type of theory of which Johnston was probably thinking in his definition—the Warntz and Berry kind—it allows for the Massey and Gibson-Graham sort, too. Theory might be formal, or simplify, or produce predictions, but in Culler's definition, it may take on none of those characteristics and still count as theory. Theory might be based upon an almost-forgotten lecture about the nature of sedimentary rocks, or be derived from pressing imperatives around women's safety and strategies for resisting sexual violence. All are potentially grist for the theoretical mill.⁶

However, not all theories are the same. Here the distinction I drew above between epistemology and hermeneutics is germane. I argue that, as applied to theory, each implies a specific set of conditions that shape and constrain what counts as an appropriate novel and persuasive vocabulary in redescription. Specifically, I suggest that epistemological theorizing characterized the first economic geographical theorizing around the quantitative revolution, while hermeneutic theorizing increasingly characterizes the more recent cultural turn.

In expressing this relationship in such categorical terms, I realize that I am representing epistemology and hermeneutics as if they are fully centered and mutually exclusive. They are not. As ideas and as practices, both have contested, complex, and overlapping histories that are associated with particular material and social conditions and have resulted in a diverse range of positions. The epistemological tradition runs the gamut from David Hume's eighteenth-century Scottish Enlightenment empiricism to fin-de-siècle Viennese logical positivism, and the hermeneutic tradition from exegetical German Reformation scholars poring over the Bible to late twentieth-century American pragmatist philosophers Richard Rorty and Richard Bernstein poring over the texts of Continental European philosophers. Partly for reasons of brevity, and partly in the interests of providing a limited and manageable argument, I maintain that it is not possible to represent such diversity here, or to provide detailed depictions of epistemology's and hermeneutics' historical origins and subsequent incarnations. I have struggled to find a balance between simplified—and consequently flattened—treatments of epistemology and hermeneutics that are relatively easy to apply and complex and internally variegated treatments that, while intellectually dense and historically satisfying, are not easily usable within the format of a journal article. I probably oversimplify.

There is one other caveat. Setting up the binary as I have done doubtless gives the impression that epistemology and hermeneutics are separate worlds, two intellectual solitudes. However, the hermeneutic tradition is not only about understanding the world; it also concerns itself with understanding *understandings* of the world, including that of the author herself or himself (leading to reflexivity), as well as of that of other authors working within very different traditions, such as the epistemological one. They are all texts for interpretations. In this sense, hermeneutics is not so much distinct and separate from epistemology as it is in a perpetual potential relation of engagement with it, as yet another interpretation to be interpreted.

Epistemological Theorizing

By epistemological theorizing, I mean the use of those novel vocabularies that possess unambiguous meanings, the relationships among which are clear, determined, and directly comparable to an independent, real world. Johnston's (2000) definition of theory upholds this view. Presumably for him—and certainly for geographers such as Berry and Warntz—suitable vocabularies include those that sustain precise meanings, allow for transparent, often formally defined connections, and permit explanation of an outside reality. Vocabularies meeting such criteria—for example, around the mathematics of gravitational force—should be tried and further explored. Those that do not, such as those around rape, are ipso facto not useful and should be discarded. At bottom, usable vocabularies are scrupulous in their clarity and internal relations, and capable of adjudication through their accuracy in mirroring an outside world.

The word “mirror” is very important. It suggests that a visual sensibility is connected to epistemology—that to know something is also to see it. For a vocabulary to achieve epistemological status, it must reflect the world, to be a one-to-one image of it (see Jay 1992 and, in geography, Gregory 1994, chapter 2, and Dixon and Jones 1998). The nature of the connection between visualizing and epistemology and the consequences of that connection have recently attracted critical attention. Below I discuss the work of two critics, pragmatist philosopher Richard Rorty and science studies writer Donna Haraway. I argue that their works are useful because they partly explain both why epistemological theorizing took the precise form it did in economic geography and why criticisms made of it led, in part, to a different style of theorizing—the hermeneutic kind.

Rorty (1979, 38) argues that, ever since the Greeks, much of Western philosophy has been shaped by a few

“ocular metaphors.” Those metaphors—such as “mirroring,” “reflecting,” or “mind’s eye”—define the nature of genuine knowledge and equate to “accurate representation.” Knowledge that mirrors the world is genuine; knowledge that does not is spurious. With this as a criterion, the problem is to find a vocabulary that represents what is seen in pure and transparent terms, without distortion. Or—to put it into terms used in discussion of Johnston’s definition above—the problem is to find a theoretical vocabulary that enables translucent connections to the real. Rorty (1979) suggests that epistemologists have historically argued that formal vocabularies, especially those drawn from mathematics and the hard sciences, provide such translucent connections. As Galileo put it, “mathematics is nature’s own language.” In contrast, vocabularies lacking clarity—such as those found in the humanities and some social sciences—are dispensable because they are opaque or obfuscated.

For Rorty (1979, 318–19), the consequence of this epistemological view is “that certain sorts of representations, certain expressions, certain processes [become] ‘basic,’ ‘privileged,’ and ‘foundational.’” Mathematics and other vocabularies like it provide their users with a touchstone, or a foundation, for ensuring final resolution. To use Rorty’s (1979, 316) term (taken from Kuhn 1970), such vocabularies hold out the promise of “commensurability”—that is, having

a set of rules which will tell us how rational agreements can be reached on what would settle the issue on every point where statements seem to conflict. These rules tell us how to construct ideal situations in which all residual disagreements will be seen to be “noncognitive” or merely verbal or else merely temporary—capable of being resolved by doing something further.

While Rorty’s analysis of the philosophical nuances of ocularism is strong, he is weak on social power. In contrast, this is a strength of Haraway’s writings. She argues that vision or sight has been a guiding metaphor, not only for philosophers, but also for Western scientists in general. They see the world and write down its truths; yet, in so doing, they write themselves out of their own stories. Their role is that of a “modest witness” (Haraway 1997, chapter 1)—that is, dispassionately observing and recording the world in its own terms. Haraway argues that this presumption of modesty is a direct consequence of the starting point of visualizing. It creates the illusory possibility of a disembodied spectator. She (1991, 191) calls this illusion a “God trick,” the idea that it is possible to have “vision from everywhere and nowhere.” Just such a trick forms the basis of one of science’s most cherished ideas: objectivity, the belief in the possibility of a single,

final, detached, and unblemished depiction of the world. For Haraway (1991, 188), the “gaze from nowhere,” as she calls objectivity, is really a front that hides and protects the interests of those who propose and most benefit from it. As she (1997, 23) writes, “modesty pays off . . . in the coin of epistemological and social power.” In this sense, being a modest witness turns out not to be so modest after all.

In her most recent work, Haraway (1997) extends this argument. Vision remains the guiding metaphor epistemologically, but it also appears on the page itself in the form of diagrams, figures, representational maps, flow charts, graphs, and so on. Such figures appear to be the naive disclosure of things as they are: mirror representations. However, following Haraway’s critical argument, this cannot be so. Rather, they represent “fetishization,” which occurs when the social processes that actually produce such figures are hidden; they are made to appear as a thing, as the figure itself (Haraway 1997, 135). As she (1997, 135) writes, fetishism in the form of maps and figures involves “interesting mistakes—really denials—where a fixed thing substitutes for the doings of power-differentiated lively beings on which and on whom, in my view, everything actually depends.” Thus, just as, for Marx, commodity fetishism is about mistaking social processes for things, the fetishization of geographical figures is about mistaking “lines of power” for “lines of geography” (Olsson 1992, 95). This implies, not that all diagrams are somehow bad, requiring eradication, but that they necessitate adopting a critical sensibility (for examples, see Buck-Morss 1995; Haraway 1997).

In sum, epistemological theorizing strives for accurate representation, the truth of which is guaranteed by an unimpeachable vocabulary that unambiguously translates what we see into what we know. That epistemological theorizing aspires to accurate representation is a consequence of the dominance of ocular metaphors. Rorty, and especially Haraway, argue that metaphors are never innocent, and that they require vigilant scrutiny.

Hermeneutic Theorizing

Hermeneutic theorizing is more catholic in its judgment about appropriate vocabularies than is epistemological theorizing. It recognizes that no vocabulary is perfect and that a vocabulary that provides for commensurability, in the sense used by Rorty (1979), does not exist. There is no end to the vocabularies that can be drawn upon as potential candidates for theorization, and no end to the stories that one can potentially tell, including this one about epistemology and hermeneutics. One needs to be creative and experimental, suspending one’s incredulity

when trying out and asserting new vocabularies, while recognizing that no lexicon is final. Against the necessary assertiveness of one theory, there is always potential criticism and the promise of a different theoretical account. “You intend to use Marx’s theory? But have you read Harvey’s geographical take on Marx? And then there is the feminist critique of Harvey, which is divided into opposing poststructuralist and socialist feminist variants . . .”⁷ A hermeneutic sensibility does not take fright at such diverse vocabularies, but “sees the[ir] relation . . . a[s] those of strands in a possible conversation, a conversation which presupposes no disciplinary matrix which unites the speakers, but where the hope of agreement is never lost so long as the conversation lasts” (Rorty 1979, 318).

Hermeneutics, then, always tries to negotiate a knife-edge between what Rorty (1982, 191) calls “hope” and what Ricoeur (1970, 27) calls “suspicion”: that is, between the hope that there can be full agreement about a vocabulary and the suspicion that a better alternative is available. There is no final resolution to this tension, no single answer, but that does not mean that anything goes. For, while it is initially important to suspend one’s suspicion in order to give the new vocabulary—such as the rape metaphor to understand globalization, or the sedimentary rock metaphor to understand regional economic development—a chance, critical scrutiny is necessary to establish its usefulness.

Note that the community of users defines a theory’s “usefulness,” and may use as criteria its political sensibility, rhetorical power, resonance with other theories, and potential mandate and guide for different kinds of action. However, the definition would not include a theory’s ability to mirror the world (the epistemological view), because that would imply a final vocabulary, which hermeneutics denies. Instead, hermeneutics conceives theorizing as a creative and open-ended process of interpretation that is circular, reflexive, indeterminate, and perspectival (Bohman 1993, 116). It is circular because it involves a constant movement from us—the interpreter—to the interpreted and back again (the hermeneutic circle). It is reflexive because any interpretation must eventually be interpreted, requiring that we think about our thinking. It is indeterminate because the loop of interpretation has no final resolution (although, in the end, it does require action in the face of the historically open nature of understanding). And it is perspectival because interpreters are embedded in their situations, and this makes their knowledge always partial and incomplete.⁸

As a result, hermeneutic theorizing is very different from epistemological theorizing. Hermeneutics rejects fixed and final foundations; epistemology embraces them.

Hermeneutics promotes experimentation and engagement with radically different vocabularies, pressing them as far as they will go, while epistemology restricts vocabularies to those that possess precise meanings and well-defined relationships, which often means drawing upon formal languages such as those of mathematics and the sciences. Hermeneutics cultivates critical self-awareness of social and historical location and recognizes its influence on knowledge, while epistemology deems such location irrelevant, for theorists are modest witnesses. And hermeneutics is interested in keeping the conversation going, whereas epistemology directs itself to a final end in which theories mirror the world.

One more difference between the two turns on the use of metaphor. Hermeneutic theorizing shuns disembodied vision as a metaphorical blueprint. Rather, to use Rorty’s (1979) metaphor, it is based on conversation, on the idea of there being many “strands” to the discourse, with no means of evaluating them on the basis of a single criterion such as rationality. Specifically, Rorty (1989) envisages theorizing as a social practice where each participant creatively tries out novel redescriptions, taking existing interpretations and reworking them in conjunction with other reworkings. This type of conversation involves no fixed rules or final methods that constrain; there is only “an unjustifiable hope, and an ungroundable but vital sense of human solidarity” (Rorty 1982, 208). In this context, being hermeneutic is not about “having a special method, but [about] simply casting about for a vocabulary that will help” (Rorty 1979, 321). Of course, there might be long periods in which there is general agreement about helpful vocabularies. However, such agreement is sustained, as Dewey put it, by the “crust of convention,” not because theories faithfully picture the world or are anchored by some inviolable foundation (quoted in Rorty 1979, 379).

Haraway provides a more politically potent account of the conversation. Like Rorty, she stresses the importance of human discourse and interaction, recognizing the necessity of constructing networks of affiliation, of engaging in discussion, and of recognizing, not only difference, but common beliefs and shared responsibilities as well. For her, conversation is important partly because of our necessarily circumscribed subject position, which results in us attaining only “partial knowledge” (Haraway 1991, 190). To widen that knowledge, we must construct webs of connection and lines of flight, and must “share conversations in epistemology” (Haraway 1991, 191). Perhaps even more importantly, conversation is necessary for political reasons. It is not so much a “vital sense of human solidarity” that is significant as it is “solidarity in politics” (Haraway 1991, 191). Likewise, Haraway goes

much further than Rorty in emphasizing the embodied nature of theorizing—that human conversation as a metaphor should stress the corporeality of the human. Conversation means more than just talking heads. Theories represent embodied knowledge, meaning that they are constructed by particular kinds of human bodies, each of which makes a difference to what is seen. But it also means technological embodiment. Like humans, machines are not passive observers; in their very construction, they record the world from a particular slant.

This kind of embodiment bears on the knowledge presented in maps and figures. Printouts of, say, GIS systems do not provide mirror copies of the world, the view from nowhere; they always show the view from somewhere, one literally, in this case, hardwired into their production. Again, Haraway does not claim that all diagrams are bad, or that vision itself is something with which we can dispense. Her point is that we must recognize the embodied nature of vision, one grounded in specific physical bodies and tangible artifacts. To use her term, we must realize that theoretical knowledge is “situated,” meaning that it is both partial and embodied (1991, 184). Hermeneutics provides one means to cope with the consequence of this, to produce “a usable, but not an innocent doctrine of objectivity” (Haraway 1991, 189).

First-Wave Theory: The Quantitative and Theoretical Revolution

It was just such an innocent doctrine of objectivity that economic geographers had in mind in their first encounters with formal theorization in the late 1950s, known as the quantitative revolution. In many ways, both the adjective and the noun in the phrase “quantitative revolution” are misnomers. The noun is wrong because geography had been quantitative from the time of its formal institutionalization as a discipline in the nineteenth century. In Britain, the Royal Geographical Society (RGS), founded in 1830, was a classic “center of calculation” (Latour 1987, chapter 6), providing resources for foreign expeditions, the products of which were sorted, sifted, displayed, and presented back in London in the form of maps, tables, and figures (Livingstone 1992, chapter 5). Similarly, in the United States between 1852 and 1871, the American Geographical and Statistical Societies were formally twinned. Even when they went their separate ways, the mandate of the American Geographical Society remained “the collection, classification, and scientific arrangement of statistics and their results” (quoted in Berry and Marble 1968, 1). Geographers, then, were always numerate. Even within the

discipline’s reputedly least numerate paradigm prior to the quantitative revolution, areal differentiation, Richard Hartshorne (1959, 161) affirmed that “scientific knowing . . . and objectivity . . . can best be accomplished . . . by quantitative measurements . . . through the logic of mathematics.” For this reason, the widespread use of formal statistical techniques in economic geography from the 1950s onwards represented *evolution* rather than *revolution* (Chisholm 1975). The adjective is wrong because the significant events in economic geography during the 1950s involved the introduction of theory, not numbers; it was a theoretical revolution (or first-wave theory, as I call it). Indeed, this newfound theoretical sensibility was the period’s most enduring legacy. The critical question, though, is: what sort of theory was it?

Let me answer this by first sketching out a very brief history. The quantitative revolution began as a series of local affairs crystallized around one or two key individuals and places. Two sites stand out in the U.S.: the University of Washington, Seattle, associated with William Garrison and Edward Ullman; and the University of Iowa, Iowa City, linked to Harold McCarty.⁹

In the fall of 1955, Garrison, who had been trained in quantitative analysis as a meteorologist in the U.S. Air Force, gave the first advanced course in statistical methodology in a U.S. geography department. Here, numbers were not an end in themselves but a means to prosecute a new theoretical sensibility, one initially associated with classical German location theorists such as Von Thünen (Garrison and Marble 1957) and Christaller and Lösch (Berry and Garrison 1958). Another component in the Washington revolution, albeit one often neglected in conventional histories of human geography (particularly those of the quantitative revolution), were its machines. In an early advertisement for the department, its head, Donald Hudson (1955), boasted about his department’s use of an IBM 604 digital computer, another national first. Also important were the large Friden desk calculators and the duplicator that allowed Berry (1993) and others to circulate a stream of internal position papers and, in March 1958, to launch the Washington Discussion Paper series, that was sent to kindred souls around the world. Not only paper circulated and promoted the Washington message. The students themselves did so as they were hired and established their research agendas at several prestigious U.S. universities and departments, including Chicago (Berry’s institution for seventeen years), Northwestern (where Garrison and a number of his Washington “space cadets”¹⁰ held positions), and the University of Michigan.

At Iowa, Harold McCarty’s work was central. McCarty worked at Iowa’s business school before becoming

the first chair of the Iowa Geography Department in 1946. By that time, he had already recognized the benefits of an abstract economic theoretical vocabulary in the foreword to his book, *The Geographical Basis of American Economic Life* (1940). By the mid-1950s, he and his students were pioneering the application of correlation and regression analysis within economic geography, culminating in the collective report, *The Measurement of Association in Industrial Geography* (McCarty et al. 1956; Barnes 1998b). Like their Washington counterparts, these students were crucial to the spread of the word about theory.

Outside the U.S., Peter Haggett and Richard Chorley in the U.K. (the “terrible twins” of British geography) and Torsten Hägerstrand in Sweden were vital in establishing European sites for theorization and quantification. Haggett published his first piece of quantitative work in 1961 based upon fieldwork carried out near São Paulo, Brazil, and later “gate-crashed” a regional science conference in Berkeley in 1962 (Haggett 1961; 1965, vi). His book, *Locational Analysis in Human Geography* (1965, vi), which he likened to “a report from an active battlefield,” was central to codifying and solidifying the achievements of first-wave theory. Hägerstrand’s (1967) importance stemmed from his studies of spatial diffusion and his use of Monte Carlo simulation technique. With research pre-dating comparable work carried out in North America, Hägerstrand was an important early visitor to Washington in the late 1950s, introducing to students a dynamic sensibility absent from the static models to which they had been mainly exposed.

By the mid-1960s, a variegated network in place connected theoretical researchers and universities on both sides of the Atlantic. The network was both literal and figurative. Its literal aspect derived from the ceaseless movement of individuals, reprints, data sets, and mimeographs among its nodes. Faculty and graduate students traveled to workshops (such as the Michigan Inter-University Community of Mathematical Geographers [MIC-MOG] held in Brighton, Michigan); seminars and special conferences were organized (the NSF summer institutes for quantitative methods were the most well known, beginning in 1961 at Northwestern University); papers were circulated for discussion and criticism, following the tradition begun at Washington; and considerable sums of money flowed among the nodes, facilitating large-scale research projects (initially from the Office of Naval Research, but later from the National Science Foundation).

The network’s figurative aspect derived from its association with two new sets of geographical practices, one based on technique and one based on theory. The new techniques included computerization (reading FORTRAN

manuals, writing programs, interpreting printouts), and the study and application of ever more complex statistical methods (parametric and nonparametric, linear and nonlinear, static and dynamic; see Gould 1969a). Theory-based practices involved thinking about space and location in rigorously abstract terms. There were several sources for the theory. From physics came gravity and later entropy-maximizing models; from economics, sometimes by way of regional science, came the German location school; from sociology came the Chicago School, social physics, including the rank-size rule, and urban factorial ecology; and from geometry came network and graph theory and the analysis of topological forms that were incorporated into transportation studies.

More generally, the quantitative and theoretical revolution was defined by an innovative set of practices that stemmed from a distinct set of technical and theoretical competencies. In the process, economic geography moved from a field-based, craft form of inquiry to a desk-bound, technical one in which places were often analyzed from afar and frequently from the perspective of an instrumental logic. That instrumental logic formed the base of the first-wavers’ belief that their work could be useful and could make a difference to the world. Through the application of their theoretical and technical knowledge, they could leave the world better than they found it. Such liberal sentiment motivated much of the new-wavers’ early works. For example, early on at the University of Chicago, Berry (2000, chapter 3) focused his considerable theoretical and technical skills on planning issues both in his own city and further afield, in India. Even earlier, many of the “space cadets” were partially funded as graduate students by work Garrison carried out with colleagues in the civil engineering department around planning the postwar transportation infrastructure in the state of Washington (Garrison et al. 1959). Of course, the link to planning can be criticized, as later occurred. At the time, however, the practicality of epistemological knowledge was one of its most compelling features.

These are the bare bones of the narrative. How do the earlier remarks about theory and vision apply to them? First and foremost, Berry and others were doing what all theorists do: redescribing parts of the world using novel vocabularies and producing new thinking, new behavior, and new institutional forms in the process. This is why the revolution was both theoretical and revolutionary. However, it was revolutionary theory of a particular type: epistemological. From the beginning, first-wave theorists understood their novel vocabularies as foundational, in that they guaranteed the truthfulness of their representations. In one of the first debates around theory, Berry (1959, 12) argued in *The Professional Geographer* against

Fred Lukermann's (1958) call for a synoptic account, recommending a "single master key" rather than "a loaded key ring." However, Berry remained unclear about what that master key should be, although a number of suggestions—and in some cases even perorations—were put forth: Schaefer's (1953, 244) "morphological laws," Bunge's (1966, 234) "spatial logic of geometry," Garrison's (1956, 428) "universal language of mathematics," Haggett's (1965, 310) "logical reasoning," Warntz's (1957) "social physics," and regional science's logic of constrained maximization. Although different, each was held up as a theoretical foundation that mirrored the world.

Following Culler, these novel redescriptions not only involved particular kinds of vocabularies, but also concerned themselves with new kinds of activities, competencies, and internal rules and regulation, that is, social practices. For example, Susan Hanson (1993) tells of her experience at Northwestern as a graduate student, where one of her professors explicitly told her to "never question the assumptions." Technique and application came first. Similarly, David Ley (personal communication) speaks about his graduate experience at Penn State in the late 1960s as involving "a new technique a year." The point is that the theoretical revolution involved not only changed thinking, but also changed deeds. The new vocabulary of economic geography fundamentally altered what economic geographers did, whether it was punching keys of large, mechanical calculators in Iowa, learning "plug-wiring" techniques of computer programming at Washington, or drawing regression lines in Cambridge for presentations at the RGS (see the account of Haggett's RGS presentation in Chorley 1995 and Thrift 1995). Consequently, those failing to engage in these new activities were no longer economic geographers. They either dropped out, as Lukermann did beginning in the early 1960s, or were intellectually marginalized. The latter often happened to older regional geographers. For example, John Cole (1969, 160) begins his article on "Mathematics and Geography" by condemning British regional economic geographers Stanley Beaver and Dudley Stamp for being "imprecise," "tentative," "uncertain," and "neglect[ful] of meaning" in their treatment of the British Isles economy. If they had used regression analysis, their contribution would have been "real" economic geography.

Some have interpreted the rise of first-wave theory philosophically as the consequence of assiduously applying the principles of positivism (see, e.g., Gregory 1978, chapter 1). However, this is too formal an interpretation and overlooks the messiness and sloppiness of actual practice (Pickering [1995] writes of "the mangle of practice"). Apart from the graduate students at Iowa, who

were compelled to attend Gustav Bergman's classes in philosophy (he had been part of the original Vienna circle of logical positivists), few first-wave theorists had heard of positivism until the early 1970s, when it began to be directed at them as a form of criticism. For example, Richard Morrill (1993, 443) says that, while at the University of Washington in the late 1950s, he "never met a positivist." One might interpret *ex post* first-wave theory as exhibiting the characteristics of positivism, but that was not how most of the pioneers thought of their work at the time.

That said, due to their epistemological leanings, first-wave theorists imbibed some form of ocularism and, more generally, ideas of objectivity and modest witnessing—that is, the idea that theoretical statements, and their diagrammatic corollaries, are mirror reflections of the world. For example, Haggett (1965, 2) recognized early on the importance of the visual, writing that "of all sciences [geography] has placed greatest emphasis on seeing." More recently, in reflecting upon his work, he (1991, 5) likened it to recording the reflections of "a distant mirror." Bunge (1966) also used a mirror metaphor. In his case the central metaphor derives, not from the *distant* mirror, but from the "weird house of mirrors" found at the fairground, the reflections of which need "straightening" (1966, 242). The terminology is revealing. Bunge is suggesting that geographers—at least geographers of his inclination—use their theoretical and technical expertise to remove distortion and produce a clear and unmarred picture of the world.

For Bunge and others, those undistorted mirror images are exemplified in figures, maps, and diagrams. Such figures are not secondary or supplementary illustrations of a more important textual thesis found elsewhere. Rather, according to Susan Buck-Morss's (1995, 440) (and Haraway's) argument, these "representational maps," as she calls them, are part and parcel of the theory and object of investigation. Briefly, Buck-Morss argues that scientific analysis requires that the objects of inquiry must be made visible. However, in many cases this is not possible because the objects are an abstraction, such as the idea of the economy or (pertinent here) the space economy. In these cases, they are made visible through representational maps, such as a pair of supply and demand curves in economics (Figure 1), or the triumvirate of Von Thünen's rings, Weber's triangles, and Christaller's hexagons in economic geography (Figure 2). In each case, representational maps allow "viewers to see the whole as if from the outside, and also allow them, from a specific position inside, to find their bearings" (Buck-Morss 1995, 440).

For the purposes of this article, the most interesting feature of the representation maps of first-wave theory

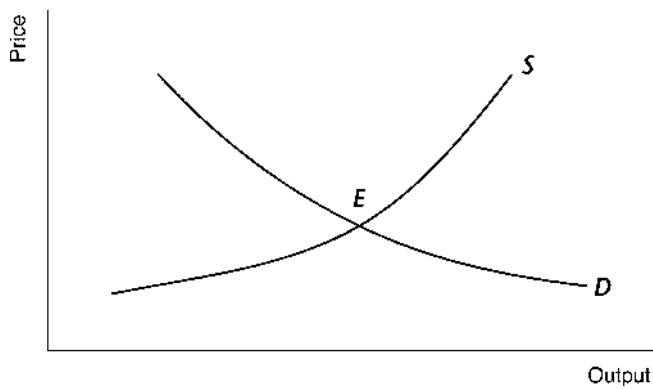


Figure 1. A pair of supply and demand curves.

was the particular conception of space in which they were drawn, Cartesian perspectivalism (Jay 1992; Gregory 1994). Associated with linear perspective, rationalist geometry, and a single but all-encompassing perspective, this particular “scopic regime,” as Martin Jay (1992) calls it, can be found, for example, in economic geography’s classic troika of diagrams to which I refer above (Figure 2). For my purposes, the important feature of this conception of space is, as Jay (1992) argues, its link to the attributes of the “gaze from nowhere” (Haraway 1991, 188). Jay (1992) maintains that Cartesian perspectivalism is directly connected to rationalism, masculinism, singularity of vision, disembodiedness, and objectivity.

Such figures, which continued to be heavily represented in economic geography textbooks well into the late 1980s (Barnes 1998a, 98), were integral to first-wave theory. They were neither facades nor cosmetic accessories, but were part of the structural theoretical undergirding. I say this, not to dismiss such diagrams, but to suggest that they need to be seen as sharing the same kinds of epistemological assumptions as the theories that they represent, and consequently as resulting in fetishization as defined by Haraway (1997).¹¹ As economic geography moved away from epistemology, the nature of the diagrams altered, signaling a different vision.

New-Wave Theory: The Cultural Turn

At some point during the late 1960s or early 1970s, the enthusiasm for first-wave theory began to ebb. For reasons of brevity, I discuss here neither the causes of this change (see Cloke, Philo, and Sadler 1991; Johnston 1991) nor the important subsequent theoretical transformations, including the rise (and sometimes fall) of Marxism, critical realism, French regulationism, and flexible production (Barnes [1996] provides a review in chapter

1). The theories proposed during this period were vital to disrupting and dislodging both the substance and the form of first-wave theory. However, none of them entirely shook off first-wave theory’s epistemology, although they made various overtures to hermeneutics (Barnes 1996, chapter 1). In contrast, a move towards hermeneutic theorizing provides one distinctive characteristic of the present cultural turn or new economic geography.

As mentioned above, Gregory’s 1978 book *Ideology, Science and Human Geography* served as an early signpost to hermeneutic theorizing. In particular, the book recast theoretical discussion in several ways: first, by treating theorization as a specific kind of social practice that could not be divorced from the interests and context of the theorizer (Gregory 1978, 18); second, by providing a far less buttoned-down, narrowly formal rendering of theory than that associated with first-wave/epistemological theorizing (Gregory 1978, 65–67); third, by planting human geography firmly within the *social sciences* and pointing to the diverse tradition of social theory from which geographers could draw inspiration and that in general they had neglected (Gregory 1978, chapters 3–5); fourth, by portraying theory as a varied discourse to be worked with, changed, and argued against, rather than as unified, fixed, and revered (Gregory 1978, preface and introduction); and finally, by moving away from a conception of theory choice based upon representational faithfulness or inviolability of foundations (Gregory 1978: 57–59). In taking up these different features, some economic geographers began offering a very different kind of theory than that found in the first wave.

That said, I do not suggest that Gregory’s book provided a complete blueprint for the new economic geography. Its relationship to subsequent change in economic geography was neither direct nor straightforward, but was loose, untidy, hesitant, contested, and geographically skewed, especially to the U.K. It involved a number of different geographers, very few of whom would characterize their work as explicitly hermeneutic, perhaps even including Gregory (although see his sympathetic discussion, 1978, especially in chapter 2). The book’s significance lay in the jolt it gave orthodox (epistemological) theorizing. It helped to temporarily stop the previous conversation about the old kind of theory, and gave hints about the direction that a new conversation might take. Gregory did what all innovative theorists do: he re-described. In this case, he re-described theory itself.

How to characterize the new work carried out in economic geography, made possible theoretically in however partial and roundabout a way by Gregory’s book? Summarizing new-wave theory as I did first-wave theory is difficult. The major events of first-wave theory are

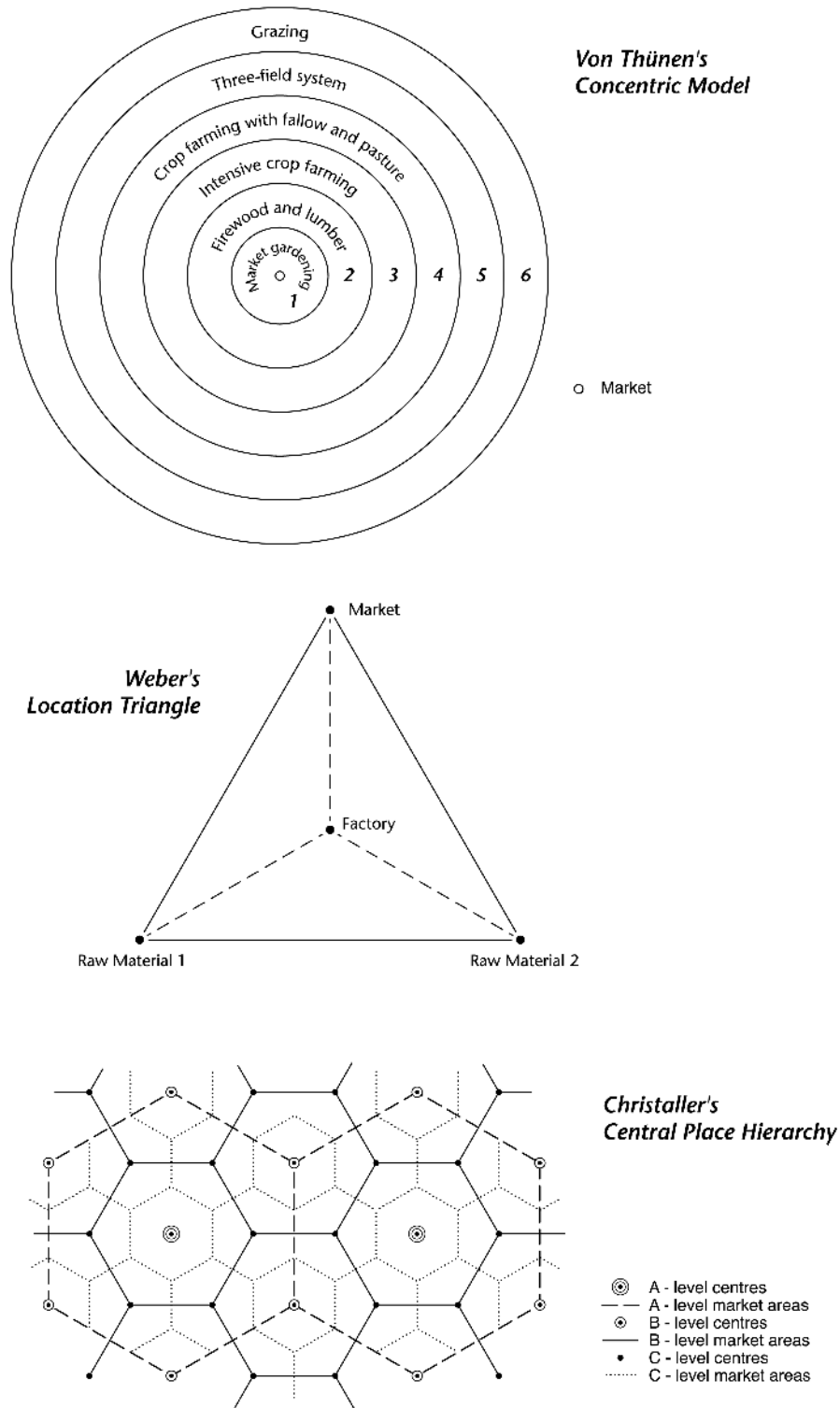


Figure 2. Von Thünen's concentric model, Weber's locational triangle, and Christaller's hexagonal central place hierarchy.

over, and I played no part in them. In contrast, the events of the new economic geography are incomplete; no one knows the ending, or even the middle, of this narrative. Also, I am a participant in the new economic ge-

ography, if only by virtue of writing an article such as this one. Such self-consciousness might be thought self-indulgent, arrogant, or just tedious, but it partly reflects the reflexive hermeneutic sensibility that I am claiming

for the new economic geography. Among other things, that sensibility stresses the importance of situating oneself as an author, which is why I began the article as I did. It is also concerned with letting readers know that *you* know that *they* know that there is no such thing as an omnipotent, “God’s-eye view” narrator.

This speaks to the first of Gregory’s points about theory, now found in the new economic geography: that theory is a social practice (critical to both Rorty’s and Haraway’s accounts, and linked to the perspectivalism of hermeneutics). Theorizing is a social activity like any other. Theory does not find its origins in heavenly inspiration; they reflect the local social context and the unequal relations of power and resources contained therein. Theorizing requires “situating” in terms of one’s own social interests, location, embodiment, and identity, as well as those of others.

One form that situating takes is the type of self-conscious introduction I provided above, which worries about how to begin an account, or how an account should be read. Within economic geography, compare, for example, the prefaces of Gibson-Graham’s (1996) *The End of Capitalism (As We Knew It)* and Berry’s (1967) *Geography of Market Centers and Retail Distribution* (his first single-authored monograph). Gibson-Graham’s preface (1996, vii–xiv) is about situating the identity of the book and its author historically, geographically, and intellectually. She (1996, xi) writes:

Becoming able to envision and ultimately to write this book has involved for me the most profound transformations both in my intellectual work and in my relation to that work. These transformations extend to, or perhaps begin with, my personal identity. For it was only in the summer of 1992 that J. K. Gibson-Graham was born . . . We had been working, thinking, and writing together for over fifteen years since undertaking a joint project on New England plant closings during our first year in graduate school. And it had become important to subvert in a practical fashion the myriad hierarchies of value and power that . . . structured our relationship, negotiated as it was across differences of nationality, age, appearance, academic training, family status, personality and experience . . .

In contrast, Berry’s preface acknowledges neither himself as an author nor his context (1967, vii–viii). His opening sentence (1967, vii), in which the die is cast, begins:

The thesis of this book is that the geography of retail and service business displays regularities over space and through time, that central place theory constitutes a deductive base from which to understand these regularities, and that the convergence of theoretical postulates and empirical regularities provides substance to marketing geography. . . .

Too much can be made of this contrast, which results in part from differences in individual style. However, it makes a substantive point, the (hermeneutic) recognition that who you are and have been affects what you know and tell others. Such self-consciousness around situatedness pervades the new economic geography, whether it turns on experiences as an undergraduate (Barnes 1996, preface), present professional status (McDowell 1997), ethnic, class, and gender position (Hanson and Pratt 1995), or wrenching life events, such as the death of a parent (Thrift 2000). In each case, it is the view from *somewhere*.

The new economic geography is also characterized by a less formalized kind of theorizing, one in which rules governing the constitution of theory are more flexible than under first-wave theory. For Rorty (1979), anything can be a theory as long as one can persuade the community of users of its usefulness. This position stems from the hermeneutic disposition of openness towards potential theoretical sources. For example, compare Gibson-Graham’s (1996, chapter 6) use of a metaphor of rape in theorizing the process of globalization with Peter Gould’s (1969b) theory of effectively the same process—the geography of modernization—analyzed using factor analysis, hierarchical and contagious diffusion models, and trend surface analysis. Or contrast Erica Schoenberger’s (1997) use of culture theory to explore the nature of the firm with David Smith’s (1971) neoclassical economic formulations. Or, counterpose writings around the new retail geography emphasizing cultural identity and bodily performance (e.g., Miller et al. 1998) with the old kind based upon versions of the gravity model and distance minimizing behavior (e.g., Berry 1967). All of these different accounts qualify as theoretical under the earlier definition; all redescribe the world using novel vocabularies. However, the first in each pairing stems from a more open-ended view of theoretical practice. This supports the argument made above about the changed meaning of theory. To be theoretical within a hermeneutic sensibility does not necessarily mean conforming to Johnston’s narrow definition of theory and associating with the use of Greek symbols, matrices of numbers, or deftly derived equations (although it might).¹² It is in this sense that a hermeneutic approach is more open-ended.

Related is the awareness within the new economic geography that the discipline is as much about writing as it is about the application of specific techniques and theories. This enhanced appreciation of writing manifests as a kind of literary belt-loosening taking the forms of wordplay (for example, Gibson-Graham’s [1996] chapter titles make allusions to President Clinton’s 1992 election slogan, songs by R.E.M. and Eric Burden and the Animals,

and a Samuel Beckett play), jokes (for example, Crang [1997] is particularly adept at self-deprecating humor), and various tropes such as metaphor (for example, Barnes' [1996, chapters 2–4] explorations of physical metaphors). Once it is recognized that theory is not capitalized, that there are no necessary formal rules, and that writing is not a technical exercise of mechanically tethering words to the world, attention is necessarily directed to using language effectively, strategically, and with force.

A third characteristic of the new economic geography—originating from perhaps the most notable features of Gregory's book—is its emphasis on the diversity of sources available for theorizing, which speaks to hermeneutics' concern with bringing together in conversation a variety of vocabularies. Of course, the theoretical sources of first-wave theory were also far-flung, but, as I argued, they tended to be of a certain common type, drawn from the physical sciences and united by their commitment to a mathematical rationality and the tenets of epistemological theorizing. While these sources spoke to the science part of geography's social science status, they were less helpful for the social part. The new economic geography—and perhaps this is its defining feature—emphasizes above all the social and especially the cultural character of the economy. The economy is neither separate nor hermetically sealed away from its wider social and cultural context; each is in a leaky relationship with the other. For example, Thrift and Olds (1996, 312) talk about the “extraordinary difficulty of separating out something called ‘the economic’ from ‘the social’ or ‘the cultural’ or ‘the political’ or ‘the sexual’ or what have you.”

Such leakiness is explored theoretically by means of a broad spectrum of interdisciplinary social and cultural theories, often associated with poststructuralism and cultural studies. Here, unlike in the case of first-wave theory, no single common bond joins these diverse sources. They include Thrift's (1996, 2000) use of actor network theory and ideas of performance, Mitchell's (1995) deployment of Granovetter's idea of social embeddedness, McDowell's (1997) utilization of Butler's theory of performativity, Peet's (1997) application of Foucaultian theory of discursive formations, Gibson-Graham's (1996) Althusserian formulations of overdetermination, and Schoenberger's (1997) cultural theoretical analysis, which draws upon ideas of Veblen, Benedict, and Bourdieu. This results, to use Thrift and Olds' (1996, 313) terms, in a “polycentric” economic geography consisting of a “set of narrative communities” that “celebrate a qualitative multiplicity of ‘economic’ times and spaces.” New-wave theory does not offer a single story, nor could it do so. That is why it is important.

A fourth feature of the new economic geography is that, within it, theory is always something to be argued against, always a work in progress (following from hermeneutics' stress on “indeterminacy”). Theoretical truths are never absolute and final; they are contingent and unfinished. However, the relative and incomplete character of theory does not render it unimportant. All theory is that way; it means that we need to keep on working, engaging in debate, making allies, and forging solidarity both intellectually and politically. This results in a discipline that is fragmented by definition, one into which theoretical pieces do not necessarily fit to produce a single, final truth. Philosopher Richard Bernstein (1991), a proponent of hermeneutics, makes a distinction that is useful here. He (1991, 8) distinguishes between *Aufhebung*, defined as a principle that allows the final reconciliation of seemingly heterogeneous elements, and a “constellation,” defined as a “juxtaposed rather than integrated cluster of changing elements that resist reduction to a common denominator, essential core, or generative first principle.” Bernstein's definition of a constellation describes the new economic geography. It comprises a collection of pieces, rather than a single, coherent entity, a “loaded key ring” rather than the “single master key” of first-wave theory (Berry 1959, 12). As a result, it is messy, characterized by different writing styles, different research methods, and different theoretical sources. For Bernstein, however, this is the very nature of any hermeneutic theoretical project that gives up on the notion of an absolute and final theoretical truth, which the new economic geography seems to have done.

Note that this does not mean that politics becomes unimportant. In fact, it is only when theory is taken as absolute and final that there is little room for political discussion. Once it is recognized that theory is provisional and always in process, political discussion becomes indispensable. Certainly the new economic geography is partially defined by a keen sense of politics around theory. As Thrift and Olds (1996, 313) put it, the “emphasis on multiplicity and openness does not mean that the new economic geography needs to be politically quiescent. It will want to generate new counternarratives, it will hunger after critical readings, it will want to disseminate new, alternative economic practices.” This reflects the same motivation—trying to improve the world—that underlay first-wave theory, but both the means and the specific ends are quite different. There is a leeriness of large scale, top-down solutions imposed from outside; instead, there is a suggestion of small-scale, local solutions worked out by those most affected, whether they be Filipina nannies in Vancouver (Pratt 1999), the female partners of miners in Central Queensland (Gibson-Graham

1996, chapter 6), or less favored regions in Europe (Amin and Thrift 1995).

The last trait of the new economic geography, which speaks to the antifoundationalism of hermeneutics, is the idea that theory need neither mirror the world nor require epistemological anchoring. The issue of mirroring has sometimes proven a difficult practice to break. Geography—and economic geography, as I noted—have upheld sight as the master sense. As per Haraway, the problem with this perspective is not sight per se, but the failure to recognize that sight is embodied. This formed the basis of Massey's (1991) and Rosalyn Deutsche's (1991) criticisms of David Harvey's (1989) *The Condition of Postmodernity*: that he failed to recognize his own body, his maleness, and the way it affected his view of postmodernity and flexible accumulation. However, situating knowledge is becoming more widespread among new economic geographers, especially those drawing upon feminist theory: for example, in Hanson's and Pratt's (1995) work on female labor markets in Worcester, Massachusetts; in Massey's (1995) work on the high-tech industry; and in McDowell's (1997) work on merchant banking.¹³

The second issue of antifoundationalism is one of the strongest motifs of new-wave theory. It also takes the form of antiessentialism or antirationalism. The gist of the argument is that one should not explain events or phenomena by reducing them to fundamental entities taken as natural, or at least lying outside of the social. For example, Garrison's claim that mathematics is a universal language that underpins the explanatory fiat of geography is a foundationalist claim (Barnes 1996, chapter 6).

The criticisms of foundationalism, essentialism, and rationalism are manifold. The one most pursued by new economic geographers is the consequent flattening out, or homogenizing, of the phenomena or events so explained; that is, the diverse economic geographical world is reduced to some singular and emaciated foundation, essence, or rationality. For example, Schoenberger (1997) argues that corporate culture cannot be reduced to the simple rationalist maxim of profit and loss. To understand why Xerox refused to pursue their leading edge research on PC systems in the 1970s, or even to market miniphotocopiers in spite of proven market demand, one must study the rich and varied history of internal corporate culture. It will not suffice to reduce such actions to missed tangents on a map of indifference curves, or to a failed connection between the lines of marginal costs and marginal revenue. In another example, Gibson-Graham (1996) argues that the economy cannot be reduced to an essence, that it is radically heterogeneous. Applying essentialist economic

geographical formulations to such heterogeneity renders it invisible, hiding, for example, the domestic economy or nonmonetary local exchange trading systems.

In sum, the new economic geography is located theoretically on the borderlands between geography, economics (typically political economy), cultural studies, and various kinds of sociology. It is the relationships between these different elements that motivates study, not the elements themselves. Associated with this diverse subject matter are a diverse set of approaches, theories, and methods that form, not an *Aufhebung*, but a constellation. For this reason, economic geography is more pluralistic, and open-ended than ever before. As a result, it is harder than ever to define an economic geographer. This would have been a cause of concern under first-wave theory, when it was essential to have an essential definition; in the hermeneutic new economic geography, it is not an issue. What counts as economic geography is defined within the constellation by a process of debate and discussion, not irrevocably fixed. Only through the process of continually redefining itself does economic geography become, as Thrift and Olds (1996, 313) write, "more inclusive and more able to mix in company."

Once we leave epistemology and its associated ocular metaphors and notions of objectivity, do we enter the mire of relativism where "mere anarchy is loosed upon the world"? The easiest response to this charge is to take stock of the current state of the discipline. While many in the new economic geography have abandoned ideas of objectivity, "mere anarchy" does not reign. The subdiscipline shows its good health in its debates and publications and the interest it attracts, as measured, for example, by specialty group membership or the initiation of new journals such as *The Journal of Economic Geography*. In contrast, regional science, with which first-wave theory was associated and which held unfalteringly to epistemology, is in dire trouble. The Regional Science Program at the Wharton School at the University of Pennsylvania, which Walter Isard established in 1958, closed down in 1996.

I do not intend to belittle the achievements of first-wave theory or regional science, both of which were considerable and sustained. However, the world has turned. Not only do the new economic geographers offer a different kind of theory—the hermeneutic kind I have described—but their practices have also changed, including everything from their reading habits to their research methods, from the geographical scale of their investigations to the type of figures found in their papers. I will elaborate on this last point by way of a conclusion, because it connects with the arguments by Buck-Morss and Jay reviewed earlier.

Under first-wave theory, the type of diagrams found in Figure 2 abounded. The neatness of the lines, and the precision of the geometry, perfectly reflected the broader theoretical attitude to economic geography: that the economic landscape was fundamentally ordered and could be grasped all of a piece on either an A4 or an eight-and-a-half-by-eleven-inch sheet of paper. By contrast, the new economic geography typically shuns such diagrams; the world is too messy, too fractured, too full of vested interests and competing perspectives to be tidily displayed. While cartographic maps certainly remain, representational maps—in the sense used by Buck-Morss, as illustrated in Figure 2—are less common than before. Early signs of a move towards a different conception of diagrams appear in Gregory's (1978, 100) book—for example, his figure of “the structuralist problematic” based upon turning camshafts (Figure 3). A more recent example, within economic geography, involves using diagrams as visual metaphors, as in Thrift and Olds (1996, 321) (Figure 4). Similarly, photographs are used, not for mimesis, but as texts to be read and interpreted (for example, McDowell's [1997] interpretations of photos of various traders and financial analysts in the City of London). The visual is no less important now than it used to be, but it is used in a different way, reflecting a wider theoretical change. To use Jay's (1992, 187) vocabulary, Cartesian perspectivalism is less important and the “baroque” is more. By baroque, Jay (1992, 187) means a form of visualization that rejects “God's-eye view” and “belief in legible surfaces” for one that plays self-consciously with the ambiguity of meaning and forms of representation. That is, illustrations are used less as mirror representations of the world than as complex

social texts in their own right, to be interpreted and argued.

Conclusion

As I descended into Chicago's O'Hare Airport on my way to begin graduate school in Minnesota, I remember thinking that the cars, houses, factories, and shops I saw from my window seat looked very similar to those I had seen as we took off from Heathrow. Maybe America would not be that different from England after all. I was utterly wrong. While America appeared familiar, over the following five years I was frequently stumped, often stimulated, sometimes shocked, and occasionally elated by its differences. In this article, I have argued that good theory should have the same kinds of effects on its users.

Within the context of postwar Anglo-American economic geography, I have identified two theoretical moments that produced such effects (although clearly there were others): the quantitative revolution and the cultural turn. I chose those two movements because they illustrate both continuity and rupture in the practice of theorizing within the discipline. The continuity arises from drawing upon outside disciplines for theoretical inspiration, “mak[ing] the strange familiar and . . . readers conceive of their own thinking, behavior and institutions in new ways” (Culler 1982, 9). The theoretical language of the quantitative revolution came primarily from the natural sciences and those social sciences that modeled themselves on them (such as economics; see Mirowski 1989). Once that vocabulary was generally accepted (albeit not without resistance; see Berry 1993),

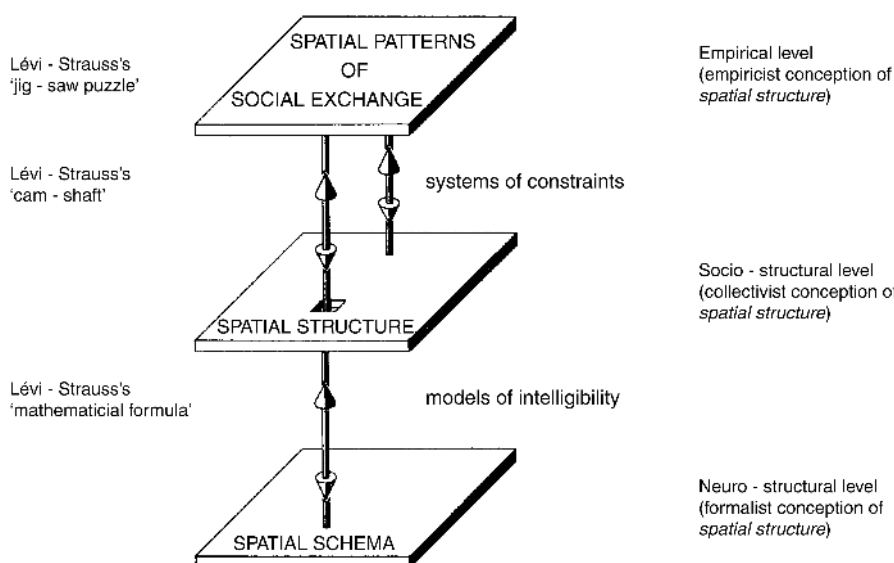


Figure 3. “The structuralist problematic and the levels of spatial structure.” Reprinted by kind permission of ITPS from Gregory (1978, 100).


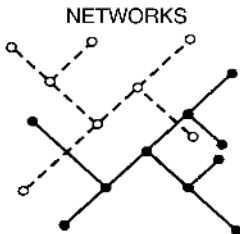
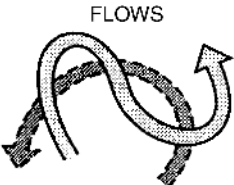

<u>TOPOLOGICAL PRESUPPOSITION</u>	<u>CURRENT MAJOR THEORIST</u>	<u>INSPIRATIONS</u>	
BOUNDED REGIONS 	FOUCAULT	BIOLOGICAL Parts of Body	PHYSICAL Euclidean Spaces
NETWORKS 	LATOUR	Nervous System	Electrical Networks
FLOWS 	DELIUZE	Circulation of Blood	Energy
TWO PLACES AT ONCE 	BOHM	DNA	Quantum Physics

Figure 4. "Four topological propositions." Reprinted by kind permission of Arnold from Thrift and Olds (1996, 321).

thinking, behavior, and institutions were fundamentally altered. In the case of the cultural turn, the vocabularies are more diverse but the consequences are similar, albeit not yet as pervasive or entrenched, given its more recent origin.

The rupture occurs around the conditions placed on theorizing as an activity. I have focused specifically on two types of theorizing found over the postwar period. The first, associated with the quantitative revolution and called epistemological, seeks knowledge of the world through the positing of some foundational vocabulary that guarantees truth. The second, associated with the cultural turn and called hermeneutics, strives for interpretive accounts that are open-ended, reflexive, and self-consciously perspectival and partial.

I recognize that this distinction is probably more sharply drawn than it should be. The boundary between the two is to some degree porous, allowing people to cross and even recross. I have also probably made too prominent the role that Gregory's (1978) *Ideology, Science, and Human Geography* played in the unraveling—in different

senses—of the first- and new-wave theories of economic geography. It would be convenient for historians of the discipline, and for my story, if intellectual change was this well demarcated, but it rarely is.

That said, there is no doubt that what it means to "do" theory differs sharply between the old and the new economic geographies, and in the process redefines the very discipline itself.¹⁴ However, there is one sense in which first-wave theorists (although not first-wave theories) have recently moved closer to new-wavers. As the pioneers of the quantitative revolution reflect on their past, many have begun to situate their knowledge within the historical context of their lives (Billinge, Gregory, and Martin 1984; *Urban Geography* 1993; Gould 1999; Berry 2000; Gould and Pitts forthcoming). Thus, while in their theoretical work first-wavers stressed the view from nowhere, their contemporary reminiscences vividly call up embodied views from somewhere: of wartime experiences; of new starts in far-off places; of a Cold War America that promoted science, technology, and planning; of a sometimes fiercely competitive and ambitious male com-

munity of graduate students and young professors; of frustrating but usually rewarding battles with machines and numbers in dingy basements or laboratories; of NSF workshops, of free-flowing money, of jobs for the taking, sometimes without interviews or even advertisements. Ironically, after thirty or forty years, first-wave theorists are now practicing hermeneutics, relating their work to their lives and times. By our memories, and not our models, shall you know us.

Acknowledgments

A version of this article was first presented at the annual meeting of the Association of American Geographers, Boston, Massachusetts, March 1998, in a session convened by Amy Glasmeier. I would like to thank her, members of the audience who asked me questions, the many geographers I interviewed in order to write the article, and Dan Hiebert, Richard Powell, Eric Sheppard, and especially John Paul Jones for their encouragement and astute comments. In addition, I very much appreciated the comments of the seven referees, who provided some extremely useful suggestions that greatly improved the article. I wrote much of this article when I held a Canada-U.S. Fulbright Fellowship (1997–1998). A UBC Hampton and a Canadian SSHRC grant also funded the research.

Notes

1. Peter Gould (1986, 7) also fondly remembers taking Lösch's "slate-gray book" across Northwestern's campus to his first class with regional economist Charlie Tiebout in January 1957, "glad to get out of the raw wind that swept flurries of snow across Lake Michigan."
2. I am not suggesting that I think of myself as a second Brian Berry! I initially presented this article at a plenary session at the 1998 Association of American Geographers' annual conference in Boston, which coincided with the twentieth anniversary of my move to North America. The presentation offered an opportunity for both personal recollection and disciplinary stock-taking, and, having recently read Berry's (1993; 1995) reminiscences, I felt that a comparison between the two of us was one means to effect both ends. In addition, making myself visible from the outset of the article speaks to my wider theoretical argument that emphasizes the importance of situated knowledge, discussed later in the article.
3. Gregory's book clearly did not emerge *de novo*, out of the blue. It was a response to the theoretical ferment of the 1970s in which a number of "isms" competed for attention: Marxism, humanism, symbolic interactionism, idealism, structuralism, existentialism, phenomenology, and more besides. Furthermore, Gregory was not the only person retheorizing theory at that time. For example, Olsson (1975) was pursuing a similar end, albeit using different means. The significance of Gregory's book lay in the fact that it both dis-
4. The term "hermeneutics" has a very long and diverse history dating back at least to the Greeks, when it meant "to announce, clarify, or reveal." I use the term to signal an interpretive mode of inquiry that stresses an open, critical, and reflexive sensibility. I define the term in detail later in the article. Bernstein (1984) provides a useful history of and introduction to the term, one that meshes with my use of it.
5. The article comprises the theoretical component of a larger project to write about the postwar history of Anglo-American economic geography. To that end, I interviewed the following geographers between 1997 and 2000: John Adams, Brian Berry, Larry Brown, Bill Clark, Kevin Cox, Michael Dacey, Michael Dear, Roger Downs, Bill Garrison, Art Getis, Reg Golledge, Michael Goodchild, Peter Gould, Chauncy Harris, Geoff Hewings, John Hudson, Jim Lindberg, Fred Lukermann, Dick Morrill, John Nystuen, Gunnar Olsson, Phil Porter, Allan Pred, Gerard Rushton, Allen Scott, Ned Taaffe, and Waldo Tobler. I taped and transcribed the interviews, and transcripts were then sent back to the interviewees for changes and amendments. I do not specifically quote from any of the transcripts in this article, but I do make use of some of the factual information provided. An initial analysis and interpretation of some of the transcripts will be found in Barnes (2001).
6. Rouse (1996, 114) makes a similar point about "motley theorizing."
7. Culler (1997, 15–16) provides the broader argument and the basis for my example here.
8. In arguing recently for "close dialogue" as a theoretical method for economic geography, Gordon Clark (1998) comes close to advocating a hermeneutic sensibility defined by these four features. Clark sympathizes with some forms of pragmatism, although he (1998, 77) is specifically suspicious of Rorty's "agnostic stance with respect to truth."
9. Other significant sites within the U.S. included Northwestern University, where Garrison received his Ph.D. in 1950, and the University of Chicago, where Ullman was a student. At Harvard in 1938, just before Ullman returned to Chicago to undertake a Ph.D., he had his first contact with Lösch, there on a Rockefeller fellowship, who suggested that he read Christaller's thesis on central places (Ullman 1980, 221; Berry 1995, 298). That reading of Christaller led Ullman to write "A Theory of Location for Cities" in 1941, which was one of the reasons that a group of very bright graduate students gathered at the University of Washington, Seattle, in the mid-1950s. That said, neither Northwestern nor Chicago—at least in the late 1950s—possessed the same critical mass of quantitative-minded graduate students found at Iowa and Washington.
10. UCLA's Joe Spencer coined the term "space cadet" at a Pacific Coast regional meeting of the Association of American Geographers held in Seattle in 1956. The original "cadets" were Brian Berry, Ronald Boyce, Duane Marble, Richard Morrill, and John Nystuen. William Bunge, Michael Dacey, Arthur Getis, and Waldo Tobler later joined them.

11. While I would contend that first-wave theorists such as Berry provided little, if any, discussion of their situatedness in their public claims to knowledge in both their written texts and their diagrams, acknowledgment of this situatedness can be seen in private. It occurred in the interviews I conducted (see endnote 5), as well as the jokes, pranks, and spoofs that emerged at the time and occurred at conferences and workshops or in short-lived privately mimeographed journals (such as Peter Gould's *Geography*, put out during the early 1960s). One example is the well-known cartoon of the seminaked female "Geographia" being hauled across the River Calculus by the muscular, hirsute, and entirely naked male "Quantifactus" (*Geography* 1964). That cartoon deserves interpretation for all kinds of reasons. For the point at hand, however, its significance is that it was never part of the public record. Thus, while first-wave theorists may have engaged in private and even in-group reflection on their situation, such situating never entered their public theoretical pronouncements—nor, if my argument is correct, could it have done so, given their epistemological allegiances. I owe this point and example to one of the referees for this article.
12. Plummer, Sheppard, and Haining (1998, 576) claim "to avoid the dualism" of either formalized (epistemological) theory or a contextualized (hermeneutic) kind by having both. Certainly, Eric Sheppard consistently stresses the importance of integrating social and formal theory. To do so, though, requires a broad definition of theory, such as Culler (1997) provides, and a willingness to keep the conversation going between different traditions. In this sense, Sheppard's project requires a hermeneutic sensibility as I have defined it. Another possible example of a conversation between the epistemological and hermeneutic traditions is Ron Martin (1994), who is interested in both formal economic geographical theory and on-the-ground institutional formation and change derived from Thorstein Veblen's work. Daniel Sui (2000, 580) offers a general argument about the need to keep the conversation going across different traditions using the term "eclectic consilience," which he works through using the examples of quantitative and qualitative research methods.
13. For an argument that the concept of situating emerged earlier in geography, see Merrifield (1995).
14. For a vivid illustration of the difference between the two, compare two exemplary collections published exactly thirty years apart: Smith, Taaffe, and King (1967) and Lee and Wills (1997).

References

- Amin, A., and N. J. Thrift. 1995. Institutional issues for the European regions: From markets and plans to socioeconomics and powers of association. *Economy and Society* 24:43–66.
- Barnes, T. J. 1996. *Logics of dislocation: Models, metaphors, and meanings of economic space*. New York: Guilford.
- . 1998a. Envisioning economic geography: Three men and their figures. *Geographische Zeitschrift* 86:94–105.
- . 1998b. A history of regression: Actors, networks, machines, and numbers. *Environment and Planning A* 30:203–23.
- . 2000. Inventing Anglo-American economic geography: 1889–1960. In *A companion to economic geography*, eds. E. Sheppard and T. J. Barnes. Oxford: Blackwell.
- . 2001. Lives lived and lives told: Biographies of the quantitative revolution. *Society and Space: Environment and Planning D* 19.
- Bernstein, R. J. 1984. *Beyond objectivism and relativism: Science, hermeneutics, and praxis*. Philadelphia: University of Pennsylvania Press.
- . 1991. *The new constellation: The ethical-political horizons of modernity/postmodernity*. Cambridge, MA: MIT Press.
- Berry, B. J. L. 1959. Further comments concerning "geographic" and "economic" in economic geography. *Professional Geographer* 9:11–12.
- . 1967. *Geography of market centers and retail distribution*. Englewood Cliffs, NJ: Prentice-Hall.
- . 1993. Geography's quantitative revolution: Initial conditions. A personal memoir. *Urban Geography* 14:434–41.
- . 1995. Whither regional science? *International Regional Science Review* 17:297–305.
- . 2000. *Modo vincis, modo vinceris: An autobiography*. Unpublished manuscript.
- Berry, B. J. L., and W. L. Garrison. 1958. The functional bases of the central place hierarchy. *Economic Geography* 34:145–54.
- Berry, B. J. L., and D. F. Marble, eds. 1968. *Spatial analysis: A reader in statistical geography*. Englewood Cliffs, NJ: Prentice Hall.
- Billinge, M., D. Gregory, and R. L. Martin, eds. 1984. *Recollections of a revolution: Geography as spatial science*. London: MacMillan.
- Blaug, M. 1979. The German hegemony of location theory: A puzzle in the history of economic thought. *History of Political Economy* 11:21–29.
- Bodman, A. 1991. Weavers of influence: The structure of contemporary geographic research. *Transactions of the Institute of British Geographers* 16:21–37.
- . 1992. Holes in the fabric: More on the master weavers in human geography. *Transactions of the Institute of British Geographers* 17:108–9.
- Bohman, J. 1993. *New philosophy of social science: Problems of indeterminacy*. Cambridge, MA: MIT Press.
- Buck-Morss, S. 1995. Envisioning capital. *Critical Inquiry* 21:435–67.
- Bunge, W. 1966. *Theoretical geography*. 2nd ed. Lund: Gleerup.
- Burton, I. 1963. The quantitative revolution and theoretical geography. *The Canadian Geographer* 7:151–62.
- Chisholm, G. G. 1889. *Handbook of commercial geography*. New York: Longman, Green, and Co.
- Chisholm, M. 1975. *Human geography: Evolution or revolution?* Harmondsworth: Penguin.
- Chorley, R. J. 1995. Haggett's Cambridge: 1957–66. In *Diffusing geography: Essays for Peter Haggett*, ed. A. D. Cliff, P. R. Gould, A. G. Hoare, and N. J. Thrift, pp. 355–74. Oxford: Blackwell.
- Clark, G. L. 1998. Stylized facts and close dialog: Methodology in economic geography. *Annals of the Association of American Geographers* 88:73–87.
- Cloke, P., C. Philo, and D. Sadler. 1991. *Approaching human geography: An introduction to contemporary theoretical debates*. London: Paul Chapman.
- Cole, J. P. 1969. Mathematics and geography. *Geography* 54: 152–64.
- Cooke, P. 1989. *Localities: The changing face of urban Britain*. London: Unwin Hyman.
- Crang, P. 1997. Cultural turns and the (re)constitution of economic geography: Introduction to section one. In *Geogra-*

- phies of Economies, ed. R. Lee and J. Wills, pp. 3–15. London: Arnold.
- Culler, J. 1982. *On deconstruction: Theory and criticism after structuralism*. London: Routledge & Kegan Paul.
- . 1997. *Literary theory: A very short introduction*. Oxford: Oxford University Press.
- Deutsche, R. 1991. Boy's town. *Environment and Planning D: Society and Space* 9:5–30.
- Dixon, D., and J. P. Jones. 1998. My dinner with Derrida, or spatial analysis and poststructuralism do lunch. *Environment and Planning A* 30:247–60.
- Garrison, W. 1956. Applicability of statistical inference to geographical research. *Geographical Review* 46:427–29.
- Garrison, W. L., B. J. L. Berry, D. F. Marble, J. Nystuen, and R. L. Morrill. 1959. *Studies of highway development and geographic change*. Seattle: University of Washington Press.
- Garrison, W. L., and D. F. Marble. 1957. The spatial structure of agricultural activities. *Annals of the Association of American Geographers* 47:137–49.
- Gibson-Graham, J. K. 1996. *The end of capitalism (as we knew it)*. Oxford: Blackwell.
- Gould, P. R. 1969a. Methodological developments since the fifties. *Progress in Geography* 1:1–49.
- . 1969b. *Spatial diffusion*. AAG Resource Paper no. 4. Washington, DC: Association of American Geographers.
- . 1986. August Lösch as a child of his time. In *Space-structure-economy: A tribute to August Lösch*, ed. R. H. Funck and A. Kuklinski, pp. 7–19. Karlsruhe: Von Loeper Verlag.
- . 1999. *Becoming a geographer*. Syracuse, NY: Syracuse University Press.
- Gould, P. R., and F. Pitts, eds. Forthcoming. *Geographical voices*. Syracuse, NY: Syracuse University Press.
- Gregory, D. 1978. *Ideology, science, and human geography*. London: Hutchinson.
- . 1993. Classics in human geography revisited: *Ideology, science, and human geography*: Author's response. *Progress in Human Geography* 17:513–14.
- . 1994. *Geographical imaginations*. Oxford: Blackwell.
- Hägerstrand, T. 1967. *Innovation diffusion as a spatial process*. Translated by A. Pred. Chicago: University of Chicago Press.
- Haggett, P. 1961. Land use and sediment yield in an old plantation tract of the Serra do Mar, Brazil. *Geographical Journal* 127:60–62.
- . 1965. *Locational analysis in human geography*. London: Edward Arnold.
- . 1991. *The geographer's art*. Oxford: Blackwell.
- Hanson, S. 1993. "Never question the assumptions" and other scenes from the revolution. *Urban Geography* 14:552–56.
- Hanson, S., and G. Pratt. 1995. *Gender, work, and space*. London: Routledge.
- Haraway, D. J. 1991. *Simians, cyborgs, and women: The reinvention of nature*. London: Routledge.
- . 1997. *Modest_Witness@Second_Millennium.Female.Man[®] Meets_OncoMouse[™]*. London: Routledge.
- Harcourt, G. C. 1972. *Some Cambridge controversies in the theory of capital*. Cambridge, U.K.: Cambridge University Press.
- Hartshorne, R. 1959. *Perspective on the nature of geography*. Chicago: Rand & McNally.
- Harvey, D. 1989. *The condition of postmodernity: An enquiry into the origins of cultural change*. Oxford: Blackwell.
- Hess, D. J. 1997. *Science studies: An advanced introduction*. New York: New York University Press.
- Hudson, D. 1955. University of Washington. *The Professional Geographer* 7 (4): 28–29.
- Jay, M. 1992. Scopic regimes of modernity. In *Modernity and identity*, ed. S. Lash and J. Friedman, pp. 178–95. Oxford: Blackwell.
- Johnston, R. J. 1991. *Geography and geographers: Anglo-American geography since 1945*. 4th ed. London: Edward Arnold.
- . 2000. Theory. In *The dictionary of human geography*, 4th ed., ed. R. J. Johnston, D. Gregory, G. Pratt, and M. Watts, pp. 826–27. Oxford: Blackwell.
- Kuhn, T. S. 1970. *The structure of scientific revolutions*. 2nd ed. Chicago: University of Chicago Press.
- Latour, B. 1987. *Science in action: How to follow scientists and engineers through society*. Cambridge, MA: Harvard University Press.
- Lee, R., and J. Wills, eds. 1997. *Geographies of economies*. London: Arnold.
- Leyshon, A., and N. J. Thrift. 1997. *Money/space: Geographies of monetary transformation*. London: Routledge.
- Livingstone, D. N. 1992. *The geographical tradition: Episodes in the history of a contested enterprise*. Oxford: Blackwell.
- Lösch, A. 1954. *The economics of location*. Translated by W. Woglom with the assistance of W. F. Stolper. New Haven, CT: Yale University Press.
- Lukermann, F. 1958. Towards a more geographic economic geography. *The Professional Geographer* 8:2–10.
- MacLean, K. 1988. George Goudie Chisholm, 1850–1930. In *Geographers: Bibliographical studies*, volume 12, ed. T. W. Freeman, pp. 21–33. London: Mansell Information Publishing.
- Martin, R. L. 1994. Economic theory and human geography. In *Human geography: Society, space, and social science*, ed. D. Gregory, R. L. Martin, and G. Smith, pp. 21–53. London: MacMillan.
- Massey, D. 1984. *Spatial divisions of labour: Social structures and the structure of production*. London: MacMillan.
- . 1991. Flexible sexism. *Environment and Planning D: Society and Space* 9:31–57.
- . 1995. Masculinity, dualisms, and high technology. *Transactions of the Institute of British Geographers* 20:487–99.
- McCarty, H. H. 1940. *The geographical basis of American economic life*. New York: Harper and Row Publishers.
- McCarty, H. H., J. C. Hook, D. S. Knos, and G. R. Davies. 1956. *The measurement of association in industrial geography*. Iowa City: Department of Geography, State University of Iowa.
- McDowell, L. 1997. *Capital culture: Gender at work in the city*. Oxford: Blackwell.
- Merrifield, A. 1995. Situated knowledge through exploration: Reflections on Bunge's "Geographical expeditions." *Antipode* 27:49–70.
- Miller, D., P. Jackson, N. Thrift, B. Holbrook, and M. Rowlands. 1998. *Shopping, places, and identity*. London: Routledge.
- Mirowski, P. 1989. *More heat than light*. Cambridge: Cambridge University Press.
- Mitchell, K. 1995. Flexible circulation in the Pacific Rim: Capitalisms in cultural context. *Economic Geography* 71:364–82.
- Morrill, R. 1993. Geography, spatial analysis, and social science. *Urban Geography* 14:442–46.
- Natter, W., and J. P. Jones. 1993. Signposts towards a poststructuralist geography. In *Postmodern contentions: Epochs, politics, space*, ed. J. P. Jones, W. Natter, and T. R. Schatzki, pp. 165–203. New York: Guilford.
- Olsson, G. 1975. *Birds in egg*. Michigan Geographical Publications no. 15. Ann Arbor, MI: University of Michigan.

- . 1992. Lines of power. In *Writing worlds: Discourse, text, and metaphor in the representation of landscape*, ed. T. J. Barnes and J. S. Duncan, pp. 86–96. London: Routledge.
- Peet, R. 1997. The cultural production of economic forms. In *Geographies of economies*, ed. R. Lee and J. Wills, pp. 37–46. London: Arnold.
- Pickering, A. 1995. *The mangle of practice: Time, agency, and science*. Chicago: University of Chicago Press.
- Plummer, P. S., E. S. Sheppard, and R. P. Haining. 1998. Modeling spatial price competition: Marxian versus neoclassical approaches. *Annals of the Association of American Geographers* 88:575–94.
- Pratt, G. 1999. From registered nurse to registered nanny: Diverse geographies of Filipina domestic workers in Vancouver, BC. *Economic Geography* 75:215–36.
- Ricoeur, P. 1970. *Freud and philosophy*. New Haven, CT: Yale University Press.
- Rorty, R. 1979. *Philosophy and the mirror of nature*. Princeton, NJ: Princeton University Press.
- . 1982. *Consequences of pragmatism (essays: 1972–80)*. Minneapolis: University of Minnesota Press.
- . 1989. *Contingency, irony, and solidarity*. Cambridge: Cambridge University Press.
- Rouse, J. 1996. *Engaging science: How to understand its practices philosophically*. Ithaca, NY: Cornell University Press.
- Schaefer, F. K. 1953. Exceptionalism in geography: A methodological introduction. *Annals of the Association of American Geographers* 43:226–49.
- Schoenberger, E. 1997. *The cultural crisis of the firm*. Oxford: Blackwell.
- Shotter, J. 1993. *Cultural politics of everyday life: Social constructionism, rhetoric, and knowing of the third kind*. Buckingham: Open University Press.
- Smith, D. M. 1971. *Industrial location: An economic geographical analysis*. New York: John Wiley.
- Smith, R. T., E. J. Taaffe, and L. J. King. 1967. *Readings in economic geography: The location of economic activity*. Chicago: Rand McNally.
- Sui, D. 2000. New directions in ecological inference: An introduction. *Annals of the Association of American Geographers* 90:579–82.
- Thrift, N. J. 1995. Peter Haggett's life in geography. In *Diffusing geography: Essays for Peter Haggett*, ed. A. D. Cliff, P. R. Gould, A. G. Hoare, and N. J. Thrift, pp. 375–95. Oxford: Blackwell.
- . 1996. *Spatial formations*. London: Sage.
- . 2000. Afterwords. *Environment and Planning D: Society and Space* 18:213–55.
- Thrift, N. J., and K. Olds. 1996. Refiguring the economic in economic geography. *Progress in Human Geography* 20:31–37.
- Ullman, E. L. 1941. A theory of location for cities. *American Journal of Sociology* 46:853–64.
- . 1980. Appendix: Autobiographical notes. In *Geography as spatial interaction*, ed. R. R. Boyce, pp. 217–21. Seattle: University of Washington Press.
- Urban Geography*. 1993. 14:422–56, 517–56.
- Warntz, W. 1957. Transportation, social physics, and the law of refraction. *The Professional Geographer* 9:2–7.
- . 1965. *Macrogeography and income fronts*. Monograph no. 3. Philadelphia: Regional Science Research Institute.
- Wise, M. J. 1975. A university teacher of geography. *Transactions of the Institute of British Geographers* 66:1–16.
- Wizard of Oz, The*. 1939. 102 minutes. Hollywood, CA: MGM Productions.
- Wrigley, N., and S. Mathews. 1986. Citation classics and citation levels in geography. *Area* 18:185–94.

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