

Is Geography (Still) a Science?

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Geographic science remains contested. The practice of geographic science has long been criticized on both methodological and institutional grounds, often justifiably. Even more serious is the continuing assault on the very idea of science as the objective discovery of and search for explanation in the universe, including human behaviour in space and place. This essay argues that a scientific epistemology is incompatible with a relativistic one.

Since I have purported to be practicing in the scientific camp of geography for 50 years now, a reasonably long time, I believe I dare ask the question. My answer is “sort of” or “more or less,” or “yes, but,” meaning that there is some uncertainty or ambiguity here. I am not talking about geographic practice as a humanity, which I respect, or physical geography as a natural science, but rather the mass of geography that claims to be a social science.

Fifty years is a reasonable starting date for the theoretical–statistical awakening of geography. The principal characters of the revolution have done well; there are large numbers of well-trained practitioners, and very impressive bodes of literature on what may be called “spatial science.” But that very term is symptomatic of a wider failure, not victory, in the ideology of geography.

Probably all of you are aware of the continuing controversy in the United States over evolution versus intelligent design. Despite the court victory for evolution in the Dover, PA case, the story is far from over. The large majority of Americans believe in intelligent design and conceive of science as technology, and not applicable to important arenas of life. Geographers may be more sophisticated, but I am not convinced that the intellectual leadership of geography is inherently different. “Normal” science is relegated to the trivial, mechanistic, superficial, or unimportant, and as incapable of addressing a wider theory of society. We have let a “science” of geography be hijacked by eloquent and articulate folks who do not accept the fundamental tenets of science.

OK, so what is science? Science refers to the objective description of and search for explanation of the universe, yes, including human individual and social

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behavior. Theory is a formal representation of phenomena, processes, or behavior, the validity of which must be testable. Thus “evolution” is a true theory, as it has not been falsified; however, intelligent design may be a plausible theory but, as the judge in the Dover case noted, is not testable and is not therefore science. The essential point is that science cannot accept untestable assertions as valid propositions. We can test whether the New Orleans levees were inadequate to withstand the tidal surge and, with somewhat more difficulty, whether there was a response bias against poor or black persons, but we cannot test the assertion that New Orleans got flooded because of the sinfulness of the residents. The evidence for global warming is substantial, but perhaps there remains a 5% chance that it is but a cyclical blip. Scientists accept that possibility. But those who would deny it because some leader or minister tells them to attest to the failure of our educational system to address superstition.

Of course there is nothing new in the assault on science, or on the idea that there is an objective reality that can be agreed upon or even that there is a common language we can use to represent such reality. In the last three centuries of the modern or enlightenment era, these conceptions of science have been under continual siege. The very term enlightenment, for example, is almost a dirty word, but I dare suggest that, to the extent that it still exists, it has been the most creative and liberating milieu in human history, and that an honest and objective appraisal would overwhelmingly support this conclusion.

But what I wish to do now is to look briefly at the pretenders to scientific knowledge and to place them in a wider context of science. We need to distinguish two forms of critique of science. First are mainly attacks on the practice of science, rather than on the conceptual idea of science, and can take the form of alternate theories of human individual or social behavior that the scientific establishment has neglected, or ignored, or more insidiously, that because the scientific establishment is a creature of a particular social order for example, male-dominated capitalism, that it was and is incapable of truly objective analysis and practice. Well, the former is true, and the second is at least somewhat true.

One key line of thought is that science, as it developed since the enlightenment in western Europe (and its colonies), served the interests of capital (and the state) and was therefore used to maintain and exacerbate inequality. Very true!—just as did religion. But this is not inherent to the idea of science, and many have struggled against this usurpation. In the early days of the development of theory and of statistical testing in geography, for example, there was a preoccupation not of any justification of capitalism and of inequality, but in trying to explain how the system worked: that is, given a land market, how do people and activities locate?

So it was reasonable that critics argued for a broader investigation of society that explicitly recognized the structures and institutions that concentrate power. The rise of Marxist thought, or of feminism, and the study of racism, and of the many faces of structuralism forced most or at least many of us with a scientific geography focus to, on the one hand, explicitly study how a wide variety of social

structures influence spatial processes and landscape outcomes, and on the other hand, to recognize how our own situation (status) might affect our practice of science. But over the last 40 years, none of this has displaced science; rather it has forced science to become more self-aware, unbiased, and rigorous. Feminist thought is thus not antiscience, or beyond science, or instead of science, but theorizes structures and behavior and outcomes that a broader science must encompass and evaluate.

Feminist perspectives, from the point of view of a scientific geography, tells us that to understand the landscape requires that we be able to assess not only the historic constraints on the autonomy of women in spatial processes (e.g., the decision of the family to move), but of course the possible alternative ways women could and did exercise power despite constraints. And perhaps women, for biological and/or social environmental reasons, may evaluate the world and make decisions differently from men. But if so, none of this is outside the realm of normal science, as is demonstrated over and over again by my colleagues at the University of Washington!

Similarly, qualitative methods are not antiscience or beyond science but are additional tools to generate ideas and insights about behavior; they do not mean the simultaneous validation of incompatible views of the same phenomena.

Society is constantly changing, especially in the global cities, and social scientists love to follow the trends of intellectual thought. This brings us all kinds of interesting terms relevant to our subject of human geography. Consider now old terms like postindustrial, postmodern, or poststructural. These could seem confusing to, say, an ordinary educated person who is downloading pictures (very modern) from her digital camera (an industrial product), but who has just been laid off from her job due to a bank merger (structures at work). The terms of course work better in humanist genres. It is too bad about the prefix "post," when what is meant is perhaps "supra" or "beyond," since the industrial basis of civilization is as absolute as ever. Billions of people in the world have yet to participate very much, although its role in the United States and other advanced countries may seem relatively diminished. Postmodern properly refers to counter-movements in art and architecture, but in social science is a reaction against certain attributes of modern life, such as auto dependency, consumerism, and suburbia. But again it tells us next to nothing about the real life of most people in the world, billions of whom cannot wait to embrace the modern—and they will. Poststructural represents a retreat from a theory of utter lack of individual or social autonomy in the face of overwhelming forces of control, which was always a conception of an extreme possibility, not the story of the real world. Yet, it would be a serious delusion to underestimate the continuing vast power of ever more complex and less obvious structures of control.

Second is the more fundamental attack on the very idea and goal of science, especially of social science, that it is possible to pose and analyze and agree on broad theories of human behavior. The argument may be expressed in terms of the

risk of grand or totalizing theory, but it comes out in the end to a religious assertion, that broad truths are either revealed or unknowable. So the real battle is a question of epistemology, how knowledge is acquired and what we may deem as true or false.

It is certainly true that scientific thought, in essence, rational decision making, is amazingly weak, despite centuries of impressive development in education and communications. Society embraces new technologies, despite deep and fervent opposition, accepts nonthreatening findings from the natural sciences, ignores social science to an embarrassing extent, or seizes upon limited findings to support their articles of faith. Although individuals, households, firms, social groups, and governments all pursue their self-interest to some extent, or weigh the consequences of actions, again to some extent, a high and unknown portion of decisions are far from "optimal," even when information is good, which it rarely is; indeed, this is why so many models can be dismissed as pathetic caricatures. All the more reason, say I, to work vastly harder to discover the calculus of motives and valuations which people do use. I would argue that on balance, scientific and rational findings have been liberating, and have had a long-term constructive effect. For example, despite vast resistance, the knowledge of global warming is penetrating the world's population. But this illustrates even better science's basic weakness, because I doubt if world societies will in fact change their behavior. Here is a more subtle example: in a city like Seattle, economic analysis can show that investing in rail rapid transit is at least as idiotic as buying lottery tickets, yet I would guess that 90 percent of us well-educated geographers and planners believe *a priori* that rail transit is "right" and refuse to consider the economics.

Society and much of the academy denigrates science, despite our worship of technology, contributing vastly to our inability to understand and improve the world. Scientific geographers, that is those of us who like formal models and statistical explanations of behavior, probably do contribute to our irrelevance and denigration through our concentration on less socially significant questions, fearing or unable to tackle the behavior that really matters to societal change.

Articulate geographers, rarely from the scientific camp, have indeed dealt with many of the most serious problems of the contemporary world, the causes and consequences of increasing inequality, and its relation to global capital; gentrification, displacement, and homelessness in our cities; the ever-continuing consequences of racial discrimination, but too little has been done within a more formal computational tradition.

I dare to suggest that the most important topics are the structures that constrain realization of better lives for most people. The single strongest is, and always has been, the capacity of those in effective power (economic and cultural) to control society and to amass disproportionate wealth. It is the corporate-political-military alliance, whatever the economic social system, but in today's world, the dominant part of the triad is probably global capital. The second most powerful structure is religion, curiously exempt from serious analysis, but used throughout history to

justify the inequality of power. It is obvious that religion has been and remains both an immensely creative and supportive institution, but also an astoundingly destructive one. Iraq and Iran exemplify the weird relation between these two dominant structures. In a less obvious way, so does the relation between economic and cultural forces in the seeming widening polarization in the United States, well illustrated by the recent presidential elections.

More deeply, certainly in the United States, the pervasive acceptance of very traditional supernatural forms of belief encourage nonscientific thinking more generally, and the ability of people to hold whole structures of contradictory understandings simultaneously.

A major need is to analyze far more deeply the geographic or spatial fixes that society so loves to deal with social problems: discrimination, poverty, crime, and the environment. What are really the long-term effects of mandatory bussing for desegregation? What are the costs and effects of building or not building walls, like that in Israel, or the proposed Mexican border fence? What are the effects of public housing as such and of contemporary reconstruction that tries to integrate "classes?" What are the effects of growth management and of urban growth boundaries on housing affordability, commuting, and benefits and costs to different classes? Is there a rational basis for sin zoning in the city, or for locating prisons and other such facilities, for buffer zones for locating released sex offenders? What are the effects of gerrymandering and incumbent protection on the sense of representation? What are the effects and adaptations on particular places of the entry of immigrants, both legal and illegal. Serious answers require not only a lot more fieldwork and use of more qualitative methods than many of us are used to. Rescuing a scientific geography may require it.

What is the real issue?

The question of ontology is whether existence is material, and that what we deem spiritual is a manifestation of material nature, or whether there is a separate non-material dimension. The latter is a matter of belief, rather than testable knowledge, but science is concerned with the material world. Now you may read of tests of the effectiveness of prayer, with mixed results, but such experiments tell us nothing about whether any effects are beyond material or not; they are a disservice to either ontology.

So the subsequent question of epistemology is how we see, describe, measure, and explain this natural world of science. Here, the real fundamental issue is perfectly simple: is there one true, observable, mutually communicable, and understandable set of facts, or can there be more than one? Other questions are, in comparison, trivial quibbles. Is truth "essential" or is it relative? This is a completely different question from whether people choose to believe or accept a "set of facts" that may be demonstrably false or just untestable. The power of belief in untrue or untestable propositions is incredible, and may describe much of human

individual and social behavior, and may be the most important frontier in social science. But a scientific epistemology is simply incompatible with a relativistic one.

Why is the idea of agreed-upon explanations so resisted, so uncomfortable, so denigrated? Does it come down to a fear that our beliefs about the world (our ontology) might ultimately be proven wrong, or is it just discontent with what some feel as reductionist? But I think the dispute is contrived, because it is certainly true of human geography, for example, that our science is abysmally far from achieving even the rudiments of convincing explanation. Obviously social context confounds our every attempt, but nevertheless the goal remains, as we chip away at the task of understanding ourselves, others, and society more fully.

If we review the critique of science over the last 50 years of a theoretical, computational geography, it is probably accurate to argue that 95% of attacks on science are on the practice of science, on the inadequacy of theory, of the power of an entrenched establishment, of insufficient and superficial data, endless sins of commission and of omission, but then there is that last 5% which attacks the very idea that science is worthwhile or even possible. Are they winning?

Fortunately the answer is no, although the damage to geography of the attempt is severe. Those who would dismiss and denigrate science, and especially formal statistical approaches may command the rhetorical heights today, but not the trenches of serious scholarship today or in the future. The University of Washington was a pioneer in developing and encouraging geographic science. And 50 years later, we are still doing so. We are not taken in by extreme and exclusivist positions. Despite a diverse faculty known to expound a range of social theory and qualitative methods, all are united in a conviction that it is not a matter of either-or, but that it takes a variety of methods and a broad range of theory to achieve a science of geography, and that we are in the difficult search for truth, not revelation. And this is true I believe of many programs all over the world. In the end, I conclude that geography as a science is in fact stronger than its critics proclaim.