

## Explaining the Past and Predicting the Future \*

### Introduction

On the evening of November 9, 1989, a number of us, part of small group of social scientists attending an international meeting at the *Wissenschaftszentrum Berlin für Sozialforschung* were on the last bus from Kreuzberg, what had become a largely Turkish neighborhood in West Berlin. We came by Checkpoint Charlie. There were large numbers of people, surely enough activity to cause us to wonder what was going on. The bus driver dismissed the crowd as "another demonstration of some sort." That seemed right to us. We returned to our hotel and went to bed. The next morning we discovered that the Berlin Wall had been breached.

No one in our group (which included among others, Tony Giddens, Peter Wagner, Bjorn Wittrock, Richard Whiteley, Hans Joas, Johan Heilbron and Keith Tribe) had predicted this "dissolution--the title of Charles Maier's very good book on the subject. Nor do I think that anyone could have. Yet, Maier (1997) explains the event very well. Indeed, looking back, it seems now almost inevitable. The reasons for apparent paradox help us to see both the promise and limits of future's research.

Providing the reasons will require a brief foray into philosophy of science and into what is sometimes called philosophy of history. Neither are usually explicit features of inquiry. But it is not that inquirers lack commitments to either: for there can be no way to do social science without both.

### The Asymmetry of Explanation and Prediction

It is (still!) widely believed that (1) science searches for "laws" (or more weakly, "explanatory generalizations"), that (2) these are of the form, "Whenever F, then G," or (more weakly) "Usually, when F, then G" and (3) that accordingly, explanation and prediction are symmetrical. That is, explanation and prediction proceed via "a covering law." We can illustrate this by considering Skocpol's much discussed *States and Social Revolutions* (1979). Summarizing her summary (p. 153):

If a state organization susceptible to administrative and military collapse is subjected to intensified pressures from developed countries abroad *and* there is widespread peasant revolt facilitated by agrarian sociopolitical structures, then there will be a social revolution.

In 1789, France was subjected to such pressures and had an agrarian social structure which facilitated widespread peasant revolt.

Hence, France in 1789 had a social revolution.

The first premise is the "explanatory generalization." We can replace China or Russia for France in the second premise and thus also "explain" their social revolutions.

The argument is a perfectly valid deduction; but if the conditions are not sufficient, the first premise is false. Indeed, it is not clear whether any such explanatory generalization could be true--

---

\* In *Journal for Behavioral Sciences*, Vol. 42, No. 3 (Nov/Dec 1998), pp. 398-405.

without being trivial. But indeed, we should ask whether any scientific explanation proceeds in this fashion. While the covering law model is a defining attribute of "empiricist" (positivist, neo-positivist) understandings of science, there is now a substantial critical literature which has subjected this assumption to fatal criticisms (Scriven, 1959, 1962; Harre, 1970, 1986; Dretske, 1977; Bhaskar, 1975, 1979; Salmon, 1978, 1984; Achinstein, 1981; Aronson, 1984; Woodward, 1984; Lewis, 1986; Kim, 1987; Manicas, 1987, 1989).

First, "laws" which subsume instances (still less "mere" generalizations!) cannot explain since "entails" is the wrong relationship. Thus, Dretske: 'The fact that *every* F is G fails to explain why *any* F is G.' While at least a true universal maintains the hold on the individual case, anything less makes the main point vivid. Perhaps 67% of people exposed to Herpes I contract it; but why did Sam contract the disease (and why didn't Harry who also was exposed?) Third, it is easy to construct counter-examples where valid "explanatory arguments" with true premises are just plain silly: Thus:

Nobody that takes birth control pills regularly becomes pregnant.  
John took his wife's pills regularly.  
Hence, John did not become pregnant.

The foregoing criticism suggests that something deeper is amiss, roughly, that explaining the particular case requires something more and other than laws understood as empirical regularities.

First off, scientific laws are not best understood as of the form: "whenever this, then that." Rather they best described as statements about the causal powers of "things." I use the word "things" advisedly. Ordinary experience knows that water can dissolve salt and that it can also rust iron. This was known well before modern science. But, with modern science, we also know why. We know that ordinary water is mostly H<sub>2</sub>O, a theoretical but real "thing," and that ordinary salt is mostly NaCl, another real theoretical thing.<sup>1</sup> Molecular chemistry is a powerful theory which generates a deep understanding of the generative mechanisms (causal powers) of the "things" which constitute its domain. Roughly, by virtue of their atomic structure, hydrogen and oxygen combine to form a molecule which by virtue of its structure has a host of powers: all the things that it can do in interaction with all the other "things" in the universe. Indeed, if the theory is true, we can say that, *ceteris paribus*, NaCl *must* dissolve in H<sub>2</sub>O: it is a law of nature.<sup>2</sup>

Of course, we know also that salt doesn't always dissolve in water, just as we know (but usually ignore) that if any particular amount of salt is to dissolve in water, many other things must also happen: Somebody, e.g., has to put the salt into the water!

Two issues are involved. First, concrete outcomes are always the outcomes of many causes working conjunctively. Second, the "necessity" regards *only* relations of the theoretical things identified the law. Thus not only is ordinary water not only H<sub>2</sub>O, and ordinary salt is not only NaCl, but the necessity between H<sub>2</sub>O and NaCl holds *only if* other things are in fact equal. *They never are*: Hence the fact of contingency.

On the other hand, it may be that they are equal enough so that we have a reliable generalization: Salt will generally dissolve in water.<sup>3</sup> In some of the physical sciences, we can spell out in some detail the CP (*ceteris paribus*) clause and we can then experiment. Spelling out the conditions of the CP clause amounts to spelling out the conditions of experimental closure. We

try to make everything else equal and see if what was "predicted" (by the theory) to happen does in fact happen. If it doesn't, we can still hold to our theory. We can dismiss the experiment on grounds that we didn't achieve closure.<sup>4</sup> There is, as I hope is clear, an enormous difference between prediction in conditions of (approximate) closure and prediction in open systems--where all sorts of unaccounted-for causes will be working conjunctively to produce outcomes.

This last, of course, is the key point. It is a huge confusion to say that the goal of science is prediction.<sup>5</sup> In open systems, almost anything might happen. This does not mean that there are not laws of nature, nor that they "violated" (which is why we said *almost* anything might happen). It means rather than we best think of the world as a containing both necessity and contingency, the consequence of the fact that the universe is not a closed system. Likely, those who fail to see this take celestial mechanics as their paradigm. For most practical purposes, the solar system is closed: it is not likely that some gigantic mass will enter it and throw off our predictions (calculations) as regards the future space/time coordinates of the planets and other masses in the system.

It is now easy to see what is going on when we seek explanation. To explain, one needs to show what events and mechanisms contingently *combined* to produce the outcome. Indeed, the presumed limitations of the human sciences are rooted in both fundamental misunderstandings of science and, as Weber saw, our dominating interest in the human sciences in explaining the concrete.<sup>6</sup> The logic of explanation is the same. Explaining revolutions, like explaining the crash of TWA 800 requires a narrative which identifies the causes open-systemically at work in the world, where perhaps none are either necessary or sufficient conditions. In none of the sciences can we hope to find a "complete explanation" since there will always be yet to be identified bits and pieces in the unique causal history of any event. Generally, in fact, we are content when we have identified among the complex of causes--of which most are taken for granted, the cause or causes which seem to us to have made the difference. It was the failed circuit breaker which gets our attention, not the ubiquitous presence of oxygen.

### **The Ontology of Society**

There is a sense in which providing causal explanations in the human sciences is both easier and harder. It is easier in that human action is absolutely critical to what happens in history. But it is more difficult for two reasons: First, there are immense (theoretical) difficulties in identifying the "conditions" which enable and constrain actors, a consequence of the absence of the capacity to construct system closure--to experiment. Second, because these conditions, viz., social structures, are the "products" of human action, the conditions are themselves continually undergoing change. That is, unlike the objects of study in natural science, the objects of study in social science--institutions, social structures, social relations, etc.--do not exist independently of us. They are real but concept and activity-dependent.

Nature exists independently of us. Society does not. This has puzzled thinking about the human sciences from the beginning. Some writers have insisted that society does not exist at all, that only individuals exist. This is true in one obvious sense. We cannot 'see' society. We only see persons acting and interacting in various ways. On the other hand, it seems sensible to talk of 'social facts,' that is, (as Durkheim put it) 'ways of acting or thinking with the peculiar characteristic of exercising a coercive influence on individual consciousness.' What we do is

surely 'influenced' by 'social facts.' Otherwise, it is hard to see how there could be any patterns in social life at all or why these patterns do differ from society to society and from time to time.

We can solve the puzzle in this way. Let us say that *social structures* are *incarnate* in our activities, that they have a 'virtual existence' in that they do not exist independently of human activity. We do not 'see' social structures; we see only patterned activities, teachers teaching and employers and workers engaged in production, clerks and consumers buying and selling, males and females marrying and raising families. As Giddens writes, 'structure enters simultaneously into the constitution of the agent and social practices and "exists' in the generating moments of this constitution' (1979: 5).

Insofar, structure is both *medium* and *product* of conscious, intentional activity. Structure is medium in the sense that it is 'material' used, both enabling and constraining. For example, a person knows a language and thus *can* speak. She creates her sentences with the 'materials' of the language; she *uses* it to describe, protest, explain, etc. On the other hand, she is also *constrained* by her language. To be understood, she must conform, more or less, to the 'rules' of that language (even if these 'rules' are mainly tacit, unacknowledged by speakers). Some sentences make no sense. Sometimes, she strains to communicate her meaning, perhaps by employing creatively a metaphor. And some things simply cannot be said!

These features are fully generalizable. Everything we do involves socially available materials: institutions, cultural practices, modes of production. When we work, we work with 'materials,' language and all the particular 'rules,' 'relations' and 'tools' which make up that work-activity. Thus there are bosses who can fire us, tasks expected of us and ways to accomplish these. We work with a computer, files, telephones, etc. On the other hand, social structures are *products* in the sense that, as an unintended consequence, when we speak, we give reality to the language, reproducing it in time and space. And similarly with all other activities: Our work activity realizes the 'rules' and relations which are incarnate in that sort of work activity.

But since structure depends on activity and people are not automata, structures change. That is, in acting, we both reproduce and *transform* structure. A dead language is frozen in the grammar books; a living language changes. It remains English or Spanish but because it is used, it changes. And so with all social structures: There is both continuity and change. The family of Victorian England is not the typical contemporary American family. Both are families even while nurturing practices and role relations in families have changed-- rather dramatically.

Because social structures do not exist independently of human activity, there are differences between the physical sciences and social science, but these do not entail differences in the nature of either theory or of explanation. Two differences demand our attention.

First, as in all the sciences, since scientists must communicate with one another about 'the world,' they are engaged in interpretation. That is, in order to build a consensus about claims made, they must continually seek mutual understanding about such claims, the standards employed, the evidence adduced, and so on. The social scientist must also build a consensus about claims and theories; so social scientists are similarly engaged in interpretation. But unlike the natural scientist, 'the world' that the social scientist is describing, communicating and seeking consensus about is itself a meaningful world being reproduced (and transformed) by human activity. Activity is meaningful in that human action involves concepts, rules, norms, beliefs. Accordingly, all social research is characterized by what Giddens has called 'a double hermeneutic.' Social scientists

must interpret what are already ongoing 'interpretations' by members whose activities constitute social structure.

But, critically, although human action involves rules, norms, beliefs and competent actors 'know' enough to carry on activities, there are both unacknowledged conditions for this action and unintended consequences of it. Sweatshop Asian workers making shoes for Nike lack an understanding of the structures of global capitalism and they do not work in order to reproduce it. Owners of four-wheel drive vehicles lack an understanding of global warming, and they do not own these vehicles in order to avoid the pollution restrictions which are imposed on conventional automobiles.

Paralleling the aims of physical science, *it is a fundamental goal of social science to provide an understanding of these conditions and their lawful consequences.* By abstracting from the concrete, Marx showed that a theoretical convincing consequence of capitalist reproduction is a tendency for the profit rate to fall. This is a "law" of the system exactly parallel to the law of inertia, like it, the product of abstract theory.<sup>7</sup> Gravity, of course, prevents planets from going off in an infinite straight line and causes, in conjunction with inertia, an elliptical path. Similarly, if we look at historical capitalism we see fluctuations in the profit rate and often long-term increases in it (as recently). This does not falsify the theory since in the concrete real world, there are always other causes at work: politics, wars, natural disasters, temporary advantages of innovation, etc. Indeed, the recognition that the imperative to lower costs, itself a consequence of the system, will reduce the profit rate unless prevented, is precisely what leads capitalists to seek remedies, for example, monopoly.

Second, social science is inevitably historical and concrete. But since there are no historical laws (versus Whiggism, eschatological versions of Marxism and evolutionary theory), if we want to understand present practices we must acknowledge that they are contingent historical products and could have been otherwise. There is both radical contingency in history, and time (as current complexity theory emphasizes) makes a difference: What happens has effects on what will then happen, and so on. This means that although we can explain these different trajectories there was nothing inevitable about any of them. To be sure (as with the laws of nature), while not everything is possible and existing ensembles of social structures foreclose some possibilities, actual outcomes are always contingent.

## **Futures Research**

What then of futures research? Scientifically defensible futures research depends upon having an understanding of present arrangements, of the conditions and consequences of action. Thus, if we have an adequate theory of global capitalism (which will likely involve some complex considerations regarding politics and culture), we can understand the activities of the Nike corporation and their Vietnamese workers. We will understand both the unacknowledged conditions for that activity and at least some of the unintended consequences of it. Similarly, if we have an understanding of global warming and an understanding of political economy (along with some complex considerations regarding politics and culture), we can understand the unacknowledged conditions and at least some of the unintended consequences of the increases in the purchases of oversized vehicles by Americans. Given this, we can then say that *if these structures are more or less reproduced*, the future will likely be thus and so. But for the same

reasons that in history not everything was possible and nothing was inevitable, *there will be no way to determine actual futures*. But more than this, because action is structured, not all "scenarios" are equally possible. Massive structural change will be required for some to be realized; for others, perhaps smaller changes could have have significant consequences. This is not a matter of speculation but of fact: depending the adequacy of our understanding of present arrangements

There is no effort here to predict events; nor critically is the claim made that these structures will be more or less reproduced. I take it that the whole point of future's research is to argue that some of them at least *must* be changed if we are to preclude consequences which no one intends. This then is the real merit of futures research. The idea is not to spin out a series of possible scenarios. Rather, the idea should be to identify what, given present arrangements, are *the most appropriate political strategies to intervene positively*. To offer scenarios which are politically impossible, or even remote, is to be utopian in the worse sense. The futures is not yet made; but whatever it comes to be will be the way it is because of what we do (and do not do).

As noted, theory is critical for it alone can help us to grasp the dynamics of structures and their relations. Critical here, as well, is the fact that participants who need not be cognizant of these conditions and consequences, may well have false or distorted beliefs which are essential to the reproduction of practices. Social science is potentially emancipatory in precisely the sense that it can show that, unwittingly, persons may well be acting in ways which are, in point of fact, contrary to the interests, contributing to their own oppression and, perhaps, as well, to the destruction of the planet. Indeed, intended change requires that members have a grasp of the conditions of their activity and of their consequences. This is, of course, but the first step; but it is an absolutely essential first step.

Peter T. Manicas

### Endnotes

1. I say "real" here also advisedly so as to be clear that on the present (realist) view, we trust in theory because theoretical terms "represent" realities which (versus empiricisms) may or may not be "given in experience." See Harre (1986).
2. Everybody recognizes that good correlations need not be causal (even while, given their Humean presuppositions all our texts flounder in helping us to know when we have a cause and not a "mere" correlation). But we reject the Humean account: A causal relation presupposes a nomic and necessary connection. We need not balk at this. Indeed, Jaegwon Kim is prepared to say that "most philosophers will now agree that an idea of causation devoid of some notion of necessitation is not *our* idea of causation--perhaps not an idea of causation at all" (1987: 234).
3. Sometimes considered a law of nature, the statement, "Gold is yellow" is a generalization which is explained in terms of a host of (true) laws of nature, including physical laws regarding light, pretty well understood, and optical and psychological laws which explain human perception, which are not at all well understood.
4. That is, falsification and confirmation are symmetrically vulnerable.
5. As the foregoing suggests, the primary goal is understanding: achieving a grasp of the causal powers of things. Once this is achieved, of course, we can design technologies and intervene effectively.
6. For Weber, see Manicas (1987: 127-140). The so-called "pure sciences" (or for Weber "abstract sciences") are never sufficient to explain events. Practioners do not even try. We might say that such sciences can explain generalizations, e.g., that salt generally dissolves in water or that gold is yellow. Even so, it might be better to say that these sciences allow to understand why it that such a generalization is true. Providing such an understanding ought to be goal of science education in our schools.
7. That is, Marx's theory of capitalism stands to historical capitalist societies as molecular chemistry stands to the concrete world of ordinary "things."