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THERE IS NO SUCH THING AS A *CETERIS PARIBUS* LAW

ABSTRACT. In this paper I criticize the commonly accepted idea that the generalizations of the special sciences should be construed as *ceteris paribus* laws. This idea rests on mistaken assumptions about the role of laws in explanation and their relation to causal claims. Moreover, the major proposals in the literature for the analysis of *ceteris paribus* laws are, on their own terms, complete failures. I sketch a more adequate alternative account of the content of causal generalizations in the special sciences which I argue should replace the *ceteris paribus* conception.

1.

The so-called problem of *ceteris paribus* (hereafter cp) laws is one of those cases – unfortunately common in philosophy – in which interesting and important issues have become enmeshed in a framework that interferes with their constructive exploration. As I understand it, the dialectic surrounding the problem of cp laws goes something like this: Many philosophers hold the following set of beliefs. (1) A genuine science must contain "laws". (2) Whatever else a law is, it must at least describe an exceptionless regularity. In particular all laws have the "All As are Bs" form of (U) universally quantified conditionals in which the condition in the antecedent of the law is "nomically sufficient" for the condition in its consequent. (3) Laws are required for successful explanation and to ground or support causal claims. Even if the DN model of explanation didn't quite get the details right, explanation is at bottom a matter of providing nomically sufficient conditions for an explanandum and this requires generalizations that are laws. (4) Putting aside generalizations that are explicitly probabilistic in form, if a generalization is to be testable at all (if it is to have empirical content rather than being vacuous), it must take the form (U). If it does not, we cannot use the generalization to make determinate predictions.

These views raise an immediate problem when we confront them with the generalizations of the special sciences, few of which seem to be exceptionless or of form (U). One possible response is that this shows that the special sciences are not really sciences and that they largely employ generalizations that cannot figure in explanations and are untestable. Most

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philosophers have been unwilling to accept this response. Instead, the most common strategy has been to continue to accept beliefs (1)–(4), but to search for a way of construing the generalizations of the special sciences as "laws", despite appearances to the contrary. It is this strategy which motivates the *ceteris paribus* laws literature. The idea is that the generalizations of the special sciences, despite failing to state (at least explicitly) nomically sufficient conditions for outcomes, nonetheless (at least sometimes or if appropriate conditions are met) can be regarded as a special kind of law – a *ceteris paribus* law. Because they are laws, cp laws can figure in explanations and are testable. Thus the scientific status of the special sciences is vindicated. The project for enthusiasts for cp laws thus becomes one of specifying the conditions under which a cp law is, in the language of Earman and Roberts (1999), "scientifically legitimate" (true, non-vacuous, testable, supported by evidence, capable of figuring in explanations etc.)

On my view, this entire enterprise is misguided. First, and most fundamentally, each of the motivating assumptions (1)–(4) is wrong-headed. It is false that to qualify as genuine science a discipline must contain laws. Among other things, the notion of a law of nature is not sufficiently clear and the borderline between law and non-law too hazy for it to play this sort of demarcative role.[1] It is also false that successful explanation requires laws and false that the provision of a nomically sufficient condition for an explanandum is either necessary or sufficient for explaining it. Finally, the argument about testing sketched under (4) above is misguided for many reasons, the most immediately relevant of which is that relies on an overly restricted view of what can be predicted from a generalization. Because assumptions (1)–(4) are misguided, there is, as far as I can see, no motivation for the whole cp laws enterprise, understood as the project of construing the generalizations of the special science as laws of a special sort and then searching for general conditions for them to be legitimate.

Nor is this the only problem with the cp laws literature. A second fundamental difficulty – one that ought to carry weight even with those who do not share my conviction that the motivational assumptions that guide the enterprise are mistaken – is that the major proposals in the literature for the analysis of cp laws are, on their own terms, complete failures. Moreover, the pattern of failures makes it hard to believe that the analyses are fundamentally on the right track, correctly capturing core cases, but breaking down when applied to devious, unusual counterexamples. Instead, the analyses fail quite systematically – they don't return the right answers even in core cases. I believe that this systematic pattern of failure derives from the falsity of the motivational assumptions that guide the cp project.

There are other reasons as well to be skeptical of the notion of a cp law. Although many philosophers seem to be under the impression that generalizations that explicitly incorporate "*ceteris paribus*" clauses or other qualifying expressions of similar indeterminacy but different meaning ("if no interfering or disturbing factors are present" etc.) are common in the special sciences, it seems to me that this is simply not the case. To the best of my knowledge the only discipline in which the "*ceteris paribus*" locution itself is explicitly used with any frequency is economics, where it has a very specific meaning that does not readily generalize to other contexts. The idea that the generalizations of the special sciences should be regarded as incorporating *ceteris paribus* or other qualifying clauses is a philosopher's gloss on how these generalizations should be understood, and not an idea that draws any support from the way in which those generalizations are actually formulated by the researchers who use them. One consequence is that it is often unclear what in the special sciences corresponds to the notion that is supposedly reconstructed in the cp laws literature. This makes it hard to judge the adequacy of those reconstructions.

A closely related point concerns the great diversity and heterogeneity of the generalizations that philosophers propose to analyze in terms of the category of *ceteris paribus* laws. Some of these, like the generalization (E) considered below, which tells us about the effect of certain chemotherapy drugs on tumor remission, explicitly use words like "cause" and tell us about an effect produced by some causal factor, but do not have the form of deterministic generalizations, it being understood instead that the cause will produce the effect only when certain other circumstances, not specified in the generalization, are present. Other generalizations that are taken by philosophers to have an implicit *ceteris paribus* clause attached to them are most naturally understood, not as claims about the overall or net effect that will occur when other conditions are present, but rather as generalizations about some component or feature of the effect that is attributable to the operation of specified set of causal factors, when these are taken by themselves or are conceived as operating in isolation. For example, the gravitational inverse square law (which on my view should be understood as describing the gravitational component of the total force experienced by a mass) is sometimes claimed to be implicitly qualified by a *ceteris paribus* clause (referring to the absence of non-gravitational forces) since (it is argued) it is incorrect when non-gravitational forces are present (Cartwright, 1983; Hausman, 1992).[2] Still others, like the ideal gas law PV=nRT, are (I would argue) causal in character, but unlike (E) have the form of deterministic generalizations, even though it is common knowledge that they break down or have exceptions in various circum-

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