EDITORIAL

The use of *ceteris paribus* clauses in philosophy and in the sciences has a long and fascinating history. Persky (1990) traces the use by economists of *ceteris paribus* clauses in qualifying generalizations as far back as William Petty's *Treatise of Taxes and Contributions* (1662). John Cairnes' *The Character and Logical Method of Political Economy* (1857) is credited with enunciating the idea that the conclusions of economic investigations hold "only in the absence of disturbing causes".[1] His *Leading Principles* (1874) contains the classic example of a *ceteris paribus* law: "The rate of wage, other things being equal, varies inversely with the supply of labour". Carines' ideas were popularized by Alfred Marshall in his *Principles of Economics* (1890) where he argued for a methodology that involved holding disturbing causes "in a pound called *Caeteris Paribus*". It is unclear when the notion of *ceteris paribus* laws made its appearance in the philosophical literature; but in the nineteenth century it is to be found in Mill's *System of Logic* (1843), and in the twentieth century it gained prominence in the Hempel-inspired debates of the 1950's over the role of general laws in historical explanations, albeit under other labels such as *quasi-laws* (Rescher) or *grounded generalizations* (Scriven).

The topic of *ceteris paribus* laws is the focus of a minor but seemingly recession-proof industry in philosophy: hardly a year passes without the appearance of at least a few articles on this topic in major journals. One of the driving forces of this industry stems from a worry about the status of the special (or inexact) sciences. The worry starts from the assumptions that science aims to discover laws of nature, and that laws are necessary for the functioning of a mature science since, for example, scientific prediction and explanation rest on laws. The worry is realized when these assumptions are combined with the observation that the special sciences have not produced – and, perhaps, are incapable of producing – any plausible candidates for laws in even the most minimal version of the standard sense of that term – strictly true universal generalizations possessing wide scope and explanatory power. What can be called the CP defense of the scientific status of the special sciences takes two forms.

The first form denies that there are any relevant differences between the special and the fundamental sciences since it is *ceteris paribus* all the way

down – some, or perhaps most, of the basic laws of physics contain (perhaps implicit) *ceteris paribus* clauses. The "CP all the way down" thesis is attacked by Earman, Roberts, and Smith (this issue) who claim that it rests on confusions, misunderstandings, and outright falsehoods. Nancy Cartwright has been read as taking the opposite side of this issue. Her contribution to this issue makes it clear that she has been misread, about which more below. And in "There is No Such Thing as a *Ceteris Paribus* Law", James Woodward (this issue) contends that regular and explicit use of the *ceteris paribus* locution is confined to economics.

The second form of the CP defense drops the "CP all the way down" line (thus, admitting that there are important asymmetries between the fundamental and the special sciences) in favor of contending that *ceteris paribus* laws are scientifically legitimate. Here two issues arise. One issue concerns the content of *ceteris paribus* claims, what possible states of the world, or of its history, they include and exclude. Another concerns how such claims can be tested or confirmed. For if *ceteris paribus* claims have no content, they cannot be laws, and if they have content but we cannot come to know them, or have rational degrees of belief in them, rationally changed by evidence, then they might as well not be laws. Earman, Roberts, and Smith (this issue) express skepticism on both issues. They are joined by Woodward (this issue) who argues that extant attempts to save *ceteris paribus* laws from vacuity are massive failures.

This issue also contains several lines of response to the challenge of the scientific legitimacy of *ceteris paribus* laws, as well as papers and arguments directed more particularly to the notion of "law". Gerhard Schurz (2001, and this issue), while being critical of extant attempts to save *ceteris paribus* laws from vacuity, is sanguine about finding empirical content in *ceteris paribus* laws, provided that they entail statistical normality claims. Marc Lange is equally sanguine, but for different reasons. In "Who's Afraid of *Ceteris Paribus* Laws?" (this issue), Lange argues that, despite their open endedness, *ceteris paribus* generalizations can have a definite meaning if there is sufficient agreement – perhaps tacit – both on canonical examples that fall under the generalization and on the analogies/disanalogies with canonical examples that would supply good reasons for or against counting a factor as "disturbing". For Lange *ceteris paribus* generalizations can serve as laws of nature not because they correspond to regularities but because they function as reliable inference rules. The virtue of such an account, Lange argues, is that it directs our attention to how laws actually function in science and away from philosophers' quest for the characteristics that generalizations must have in order to deserve the honorific of 'law'.

A third defense of the legitimacy of the special sciences rejects the assumptions on which the *ceteris paribus* industry is based. Woodward is an articulate advocate for this line. In his contribution to this issue, Woodward presents an account of the nature of the special sciences on which their proper functioning does not require the establishment of laws. Rather what the special sciences thrive on are causal generalizations, which typically do not qualify as laws, but which can be subjected to rigorous testing and which serve as the basis for scientific explanations. Sandra Mitchell's "*Ceteris Paribus* – An Inadequate Representation for Biological Contingency" (this issue) challenges the claim that it is the contingency of causal regularities in biology that precludes them from achieving lawful status. She defends weakening our conception of law so that it includes the types of generalizations Woodward takes as necessary for explanation. Articulating different types and degrees of contingency, rather than relegating all non-strict dependence to a *ceteris paribus* clause, permits a more nuanced approach to characterizing the differences between the exact and inexact sciences.

This issue also contains two formal responses to the problems. Wolfgang Spohn argues that a universal generalization is a law not due to its particular content, but because a certain inductive behavior is associated with it, a behavior which may be precisely described within a dynamic theory of belief or acceptance. He continues to explain how this framework may be used for accounting also for *ceteris paribus* conditions and for responding to both the semantic and epistemic challenges posed by Earman, Roberts, and Smith. Clark Glymour takes on both the semantic and epistemic challenges posed by Earman, Roberts, and Smith. He gives "*ceteris paribus*" a subjective interpretation and, insisting that the issue of empirical content turns on whether *ceteris paribus* claims can be reliably learned in the limit, argues that we can reliably learn the truth or falsity of both our own *ceteris paribus* claims and those made by others.

Nancy Cartwright's paper "In Favor of Laws that are not *Ceteris Paribus* after All" (this issue) indicates that she is not an advocate of *ceteris paribus* laws, at least not if such laws cannot be stated in precise and closed form and do not entail strict or statistical regularities. Rather her main concern is to override positivistic scruples that prevent us from seeing that laws are basically about capacities and powers. In "Cartwright on Explanation and Idealization" Elgin and Sober (this issue) address Cartwright's claims in *How the Laws of Physics Lie* (1983) that when laws of conditional form are true, they don't apply to real world situations because the antecedent condition involves an idealization. Elgin and Sober demur on the grounds that a conditional and its contrapositive apply to the same objects, and that

if $C \rightarrow L$ fails to apply to real objects because C involves an idealization, then $\neg L \rightarrow \neg C$ applies to real objects. However, they go on to give an argument for a special case of another of Cartwright's claims; namely, true fundamental laws are not explanatory. But they also argue that there are many cases where idealizations are explanatory.

The present collection of articles reveals how the debate over *ceteris paribus* laws is tied to fundamental issues concerning the content and methodology of the sciences. Since there is no realistic hope that these issues will be resolved in the foreseeable future, the *ceteris paribus* industry will, no doubt, continue unabated. But it is our hope that this collection will help to guide the industry towards more productive ways of processing the issues.

NOTE

[1] Schurz (1995; and this issue) has contrasted this *exclusive* sense of *ceteris paribus*, in which disturbing factors are assumed to be absent, with a *comparative* sense, in which disturbing factors are not excluded but are assumed to be held constant.

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