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24. Wible's THE ECONOMICS OF SCIENCE: METHODOLOGY AND EPISTEMOLOGY AS IF ECONOMICS REALLY MATTERED

Esther-Mirjam Sent

Paraphrasing Oscar Wilde, an economist is someone who knows the price of everything and the value of nothing. For instance, in addition to the price of widgets and doodads, economists now also claim to know the price of marriage, children, health, education, and crime. So why not consider the price of science? Something along these lines must have gone through James Wible's mind when he was writing his book on *The Economics of Science*. Furthermore, Wible finds himself in a climate characterized by increasing scrutiny and control of science, in which it is not too surprising to find appeals to an economics of science. In fact, there are at least six groups concerned with what one might consider to be an economics of science, namely, orthodox economists, historians of science and technology, sociologists of science, philosophers of science, science policy experts, and real working scientists. In addition to surveying some of the literature provided by these groups, Wible also develops his own contribution to economics of science.

The survey part of Wible's book is restricted mostly to one of the six groups, namely, philosophers of science. Going back about twelve decades, the American pragmatist philosopher Charles Sanders Peirce employed what looked like modern marginal economic analysis to evaluate scientific research project selection. As Wible shows, Peirce's contribution can further be

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considered as part of modern cost-benefit analysis. More recently, responding to tendencies toward anti-foundationalism, relativism, and naturalism, philosophers of science have started analyzing how scientific knowledge is constructed out of an economic process, using market models as means of incorporating some 'social' dimension. For instance, Nicholas Rescher and Gerard Radnitzky have developed cost-benefit elaborations of Karl Popper's philosophy of science. However, a reasonable reading of the language of costs and benefits would be that it gains meaning through scientists' motivations and moves. Hence, the lack of universal meaning of the cost-benefit metaphor makes it difficult to use it as a serious analytical device in the process of research. In addition, William Bartley has argued that the bias against Popper's methodology is a consequence of market failure in the marketplace of ideas. However, such an argument takes the relationship between science and markets as unproblematic, whereas, in fact, there are several possible positions on this issue. First, science may be an entirely self-sufficient social formation that operates according to its own autonomous principles or norms antithetical to the market. Second, science and markets could be two classes of self-organizing social formations that exhibit some vague metaphorical similarities, but operate largely independently. Third, science and markets may be two distinct classes of social activities that depend upon one another in a symbiotic fashion. Fourth, markets could be the general paradigm for all modern social organization, and therefore science would then be just one special case of this generic social structure. Finally, both science and markets may be distinct social activities that display no intrinsic essential attributes, but have evolved in parallel historically from their individualist handicraft origins into large-scale multi-actor hierarchical entities. To be sure, *The Economics of Science* does survey a few of these possible positions.

Wible's own contribution first explores the idea that scientists are economically rational. For instance, scientific misconduct in general and replication failure in particular may be an economically rational response to the incentive and reward structure in science, as illustrated by the allocation of time model. Furthermore, a utility model of choice under risk may show how fraud can be interpreted as a deliberate, calculated risk that a scientist takes to gain a competitive advantage. Next, and this is, unfortunately, rarely recognized by contributors to economics of science, Wible evaluates the methodological and philosophical problems that follow from the economics of science, especially when applied reflexively to economics. For instance, Bartley's argument that competition in the marketplace of ideas is good for the growth of knowledge can be used against the monopoly power enjoyed by neoclassical economics. As Wade Hands (1994) perceptively notes: "Thus a neoclassical-based

philosophy of science is used to argue for the elimination of the neoclassical hegemony in economics. This seems a bit like throwing oneself out with one's own bath water" (p. 95). Still, Wible believes that science is governed by a self-corrective long-run adjustment process. According to him, this process may eventually lead towards an evolutionary conception of rationality in science and economics. Unfortunately, Wible does not pursue the possible pitfalls of reflexivity in the constitution of an economics of science in great depth. Hence, his evaluation does not move much beyond acknowledging both strengths and weaknesses, both possibilities and limitations, or both fertility and fruitlessness. Though Wible believes that immersion in economics of science ought to lead economists into engaging in the self-referential enterprise of rethinking their own presuppositions, he uses the argument of finite resources to limit the exploration of infinite regresses. This is somewhat surprising, for such an economic argument is itself subject to the pitfalls of reflexivity. Moreover, there are other dangers that remain unexplored by Wible (see, e.g. Sent, 1999).

First, in addition to the philosophers of science discussed by Wible, there are at least five other groups that have contributed in one way or another to some kind of economics of science, as mentioned before, and yet there is little dialogue among these groups. In addition, it is important to recognize that there have been several different historical approaches to economics of science, with the so-called newer school only starting to consolidate its position now. Second, a distinction needs to be made between economic theory of science and economic aspects of science. Whereas the former frequently appeals to the economic incentives that are central to existing economic theory, research on the latter tends to stress 'real' economic conditions. Too often, approaches to economics of science slide back and forth between these two. However, an analysis of the economic aspects of science does not have to be couched in terms of existing economic theory. Moreover, an interaction between the two may lead to a transformation of (parts of) existing economic theory, relying on the reflexivity discussed by Wible. Third, economics of science can be readily indicted for too much self-absorption, often projecting the local academic experiences of economists themselves onto the whole of 'science'. Much of this deficiency can be traced to the fact that economists have very little working familiarity with the natural sciences. Still, it could be remedied by concerted attempts to include members of the groups discussed before in the deliberations. Fourth, economics of science often presumes that the treatment of 'knowledge' is unified within economics, whereas in fact probably the most contentious debate within economic theory revolves around the proper treatment of learning and information. Furthermore, economics of science frequently equates science with knowledge and knowledge with information,

thereby raising additional thorny issues (see, e.g. Biagioli, 1999; Boyle, 1996). On the one hand, efficient market exchange requires free information. For science, collectivist notions of truth promote public access and transparency. On the other hand, optimal individual incentives require the commodification of information. For science, the Romantic individualist episteme privileges originality, and hence ownership. If science is equated with knowledge and if knowledge is equated with information, then there may be no trade, or no science, in efficient scientific markets.

Perhaps, returning to Oscar Wilde, economics of science knows the price of science, but not its value. Maybe there are multiple valuation principles operating simultaneously in science itself: one for truth, another for fame/credit, and another in money terms. Despite these concerns, the choice is either to deny that current economic transformations are having any profound influence upon science or else to mobilize some broad-based economic expertise in order to analyze and respond to the changes. Hence, space needs to be opened up for a more synergetic approach to 'science' and the 'economy'. And James Wible's *The Economics of Science* satisfies part of this need.

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