Karl Popper
The Two Fundamental Problems of the Theory of Knowledge.
Eds. Jeremy Troels, Eggers Hansen, and Andreas Bickel.
London and New York: Routledge 2012.
xxxiv + 519 pages
$26.95 (paper ISBN 978–0–415–61022–3); $90.00 (2008 cloth ISBN 978–0–415–39431–4)

Popper's *Two Fundamental Problems* was originally a trial balloon book. Popper condensed and narrowed this originally unpublished draft about the problems of induction and of demarcating the empirical sciences from non-science to become Popper's first major work, *The Logic of Scientific Discovery*. How Popper's epistemology is embedded in the tradition of neo-Kantian philosophy is luminously evident in the draft version. Popper states, "I should emphasize here that the present work will advocate Kant's *formulation of the problem* and his *method*, and also very significant parts of his *solution*." (20) Crucially, Popper followed Kant in claiming that epistemology is a special discipline. Popper asks: "*Is there a specifically epistemological method?*" (59) Popper answers: "There is a specifically epistemological method, that is, *a transcendental method*… a method that probably every theorist of knowledge (since Kant) has utilised more or less consciously." (61) According to the neo-Kantian transcendental method "Epistemological assertions… must be critically examined in the light of the actual procedure of *justification* [emphasis mine] employed by the empirical sciences; and only this—transcendental —examination can determine the fate of such assertions." (62)

Did Popper hold on to the autonomy of epistemology throughout his intellectual career? More generally, can we hold on to the autonomy of epistemology without diminishing the intellectual value of epistemology? Those are the focal questions for this review of Popper's trial balloon, a work in neo-Kantian philosophy and classical epistemology. (In what follows, I will eventually argue for an affirmative answer to both questions.)

After the critiques of Michael Polanyi and Thomas Kuhn and those of many of his former students such as Joseph Agassi, William Bartley, Imre Lakatos, Paul Feyerabend, and Ian Jarvie; and the turn to the varieties of naturalism in the writings of Willard Van Orman Quine, Daniel Dennett, and Hilary Putnam—Popper's *Logic* as a theory of science was swept away in the pounding tidal waves of repeated and unsparing criticism. Somewhat ironically, the "transcendental" method outlined in the *The Two Fundamental Problems* where, "the theory of knowledge is related to science in much the same way as science is related to the empirical world" (62), has been tacitly used—it seems—to refute Popper's philosophy of science as found in the *Logic*. Even more fundamentally, classical Kantian epistemology as the search for how knowledge is possible and what constitutes knowledge has been replaced by the naturalistic approaches in evolutionary epistemology, the sociology of knowledge, and the history of science. By and large, the latter attempt to be empirical studies of science. In the classical neo-Kantian terminology used by Popper in this pre-*Logic* book, the use of the transcendental method has apparently turned out to be an "immanent" (see 57–9) or internal critique of classical epistemology: showing how classical epistemology is internally contradictory in its description of knowledge as science by proposing methods and norms that science does not put into practice.

The result of Popper's long-term apparent failure (for so it was termed according both to mainstream philosophers of science and to some of his own disciples) to develop an intellectually valid classical epistemology of science is the genesis of a new problem-situation for epistemology as an intellectually valuable discipline. Has current epistemology profited from replacing the neo-Kantian goal of explaining how knowledge is possible with the more moderate goal of merely describing how the sciences are practiced? I think not.

In the rest of this review, I want to show how elucidating Popper's neo-Kantianism, as Popper explicitly states in *The Two Fundamental Problems*, reveals that to sideline Popper's philosophy of science as wrong-headed, as is the current fashion, represents a misunderstanding of Popper's goals in his methodological work. More importantly, I propose that Popper's trial effort also shows how even current naturalistic epistemology is on the wrong track. What we need to do in my opinion is switch back to the track of classical Kantian-style epistemology of seeking how knowledge is possible and how knowledge becomes knowledge (and science) when conforming to its own goals, norms, and methods.

As a stepping stone for elucidating the neo-Kantian frame of Popper's pre-*Logic* book (and in general his early philosophy of science), here, in a few sentences, is the argument of the *Logic*: as Hume correctly argues, inductive logic is invalid, and therefore if scientific method uses inductive logic, it is also invalid. Popper's solution to this formulation of the problem of induction is bold in its simplicity: scientific method is deductive, since it uses *modus tollens* to refute universal statements. Popper also argues that the solution to the problem of induction additionally provides a solution to the seemingly independent problem of demarcation (that is to say, the problem of defining science): a discipline is scientific when its statements are falsifiable (when they can be empirically refuted).

Popper's falsificationist philosophy of science has resulted in a remarkable body of work—prolific, broad, diverse, and novel in the history and the sociology of the sciences (physics and biology in the main)—that argues that Popper was incorrect in thinking that the sciences are defined by falsifiability. Science, according to Popper's critics, uses tacit knowledge, paradigms, metaphysical frameworks, research programmes, personal knowledge, or nothing special at all. What is the import of the many critiques of Popper's philosophy of scientific method and falsifiability as developed in the *Logic*? Most argue that it shows that Popper's philosophy of science is naïve, and that science is more dogmatic than Popper allows. However, Popper wanted to produce a theory of science, a methodology that would explain how science is able to "penetrate ever more deeply into the undreamt-of connections within nature" (437). In other words, "we do not want to accept an empirical decision based on the scientist's actual behaviour." (436) Popper's approach was thus to produce a methodology of science that could be deduced from the aims and norms of science—whether or not those aims were always achieved and whether or not those norms were always adopted.

From looking attentively at the broader and more clearly neo-Kantian pre-*Logic* work, we can see how Popper is more concerned about the aims and norms of science as a test of epistemology than he is about the actual performance or the sociology and history of science. Here is how Popper expresses his goal to return to Kant and to carry forward Kant's *Critique*(s): "With his transcendental programme, Kant showed the way for a theory of knowledge, for a

theory of science and for a critique of method (351) …the thread of the epistemological debate has to be rejoined at the point where post-Kantian metaphysics had torn it: with Kant." (352–3). Popper's point is that a neo-Kantian epistemology uses the norms and goals of science as tests for philosophies of science and epistemological theories: "Epistemological assertions and conceptualisations must be tested critically against the justification method used in empirical scientific practice; and this (transcendental) test is the only one that can decide the fate of such assertions." (469)

Has Popper's later work moved his neo-Kantian project forward? Popper's later work in evolutionary epistemology, Objective Knowledge, the searchlight theory of knowledge, World 3, and Critical Rationality, does not attempt to take into account the apparent failure according to the critics and disciples of Popper, of Popper's falsificationist philosophy of science. But do we know that classical epistemology and in particular, Popper's falsificationism, is a failure? Can we assert that a naturalist philosophy of science based in evolutionary theory (i.e. social psychology, socio-biology, and ethology), sociology of knowledge, and history has resolved (or dissolved) the classical problems of epistemology and made irrelevant Popper's falsificationism (both as a theory in classical epistemology and as a theory of science)? I think the answer is no (to the irrelevance of classical epistemology and to the irrelevance of falsificationism) for the following reason: Classical epistemology (at least in its neo-Kantian version) does not limit itself to describing how scientists actually (and historically) work in the institutions of science. Classical epistemology evaluates scientific practice against the implicit methods and norms of science. Classical epistemology, unlike epistemology naturalized, can point out where and when science fails itself and can explain the over-all success of science.

Popper has indeed carried forward the neo-Kantian project in his later work as he actually schematized in *The Two Fundamental Problems*: by explaining how knowledge is possible or how science succeeds: "Science is our farthest outpost, it is the pioneer of adaptation; therefore it has to be exposed to the process of selection. And if modern science corresponds, to a substantial degree, to our methodological ideal of a science (it is far from identical with it, as is clear from our non-naturalistic fundamental position), this is easily explained, in our world view, as an effect of natural selection." (437) When and where science succeeds, it does so because science institutionalizes the reality-check of poking trial balloons.

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