



A tale of three theories: Feyerabend and Popper on progress and the aim of science



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ABSTRACT

In this paper, three theories of progress and the aim of science are discussed: (i) the theory of progress as increasing explanatory power, advocated by Popper in *The logic of scientific discovery* (1935/1959); (ii) the theory of progress as approximation to the truth, introduced by Popper in *Conjectures and refutations* (1963); (iii) the theory of progress as a steady increase of competing alternatives, which Feyerabend put forward in the essay “Reply to criticism. Comments on Smart, Sellars and Putnam” (1965) and defended as late as the last edition of *Against method* (1993). It is argued that, contrary to what Feyerabend scholars have predominantly assumed, Feyerabend’s changing attitude towards falsificationism—which he often advocated at the beginning of his career, and vociferously attacked in the 1970s and 1980s—must be explained by taking into account not only Feyerabend’s very peculiar view of the aim of science, but also Popper’s changing account of progress.

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1. Introduction

Paul Feyerabend’s changing attitude towards falsificationism is a much debated issue within the historiography of the Popperian school in philosophy of science. As is well-known, Feyerabend made a name for himself by passionately advocating the Popperian outlook—a pretty remarkable instance being his lectures entitled *Knowledge without foundations* (1962a), which repeat (in some passages almost verbatim) large parts of Karl Popper’s famous essay “Back to the Presocratics” (1959). At some point in the 1960s, however, Feyerabend turned his back on his former mentor, and in the 1970s and 1980s he became a vociferous—perhaps the most vociferous—critic of falsificationism.

Conflicting accounts of such turn—and of the later Feyerabend’s rageful replies to those who dared to mention his previous embrace of Popper’s ideas—have been offered (see Collodel, forthcoming, for a state-of-the-art discussion of the issue). To name but two examples, John Watkins has suggested that the later Feyerabend’s derogatory remarks on falsificationism were due to his desire to

cover up an “unwanted indebtedness to Popper” (2000, p. 49), while Eric Oberheim has forcefully argued that, although Feyerabend used very freely some of Popper’s ideas, he rejected falsificationism as early as the beginning of the 1960s and he “was never a member of the Popperian school” (2006, p. 78; see also Hoyningen-Huene & Oberheim, 2000). As these examples show, there is a continued disagreement between, on the one hand, interpreters who view the early Feyerabend as someone striving to contribute to the development of Popper’s research program and, on the other hand, interpreters who argue that as early as in the first half of the 1960s he aimed at proposing a theory of science which would eventually displace falsificationism. In what follows, we shall remain neutral with respect to such debate: the main aim of the present paper is, more modestly, to point out that interpreters have oftentimes taken falsificationism to be a kind of fixed anchorage in the reconstruction of Feyerabend’s trajectory. To put it differently, it has often been assumed that Popper’s philosophy provides a good—if not the ideal—background against which to reconstruct Feyerabend’s work, among other things in view of the fact that falsificationism is a fixed system of ideas to which in different moments Feyerabend reacted, not without idiosyncrasies, in different ways.

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There is, of course, a clearly identifiable set of ideas constituting the hardcore of falsificationism that Popper never relinquished, among which the view that the method of conjectures and refutations, capturing the essence of good science, promotes progress. Nevertheless, Feyerabend scholars seem to have generally underestimated an important change which took place within Popper's philosophy between the end of the 1950s and the early 1960s, and which concerned axiological matters. More specifically, in *The logic of scientific discovery* Popper had defended a theory of science in which, as he remarked, "it is possible to avoid using the concepts 'true' and 'false'" (2002a [1935/1959], p. 273), and progress is viewed as a matter of finding corroborated theories exhibiting increasing explanatory and predictive power. Subsequently, in Chapter 10 of *Conjectures and refutations* (1963) he defended the view that scientific progress can be accounted for in terms of the increasing approximation to the truth of our theories, and was the first to put forward a formal explication of the notion of verisimilitude (or, equivalently, truthlikeness). Feyerabend was never willing to embrace Popper's second theory of progress, which conflicts with the theory of progress as a steady increase of competing alternatives that do not converge towards the truth—a theory that he put forward in the seminal essay "Reply to criticism. Comments of Smart, Sellars and Putnam" (1981c [1965]) and defended as late as the last edition of *Against method* (1993). As we shall argue, when the attempt is made to explain Feyerabend's changing attitude towards falsificationism, an accurate account ought to include not only Feyerabend's move away from Popper's ideas, but also Popper's move away from his own originary view of the aim of science.

The focus of our discussion will then be on the three theories of progress and the aim of science alluded to in the title of this paper. In Section 2, after a cursory recap of the basic tenets of falsificationism, Popper's two theories of progress will be introduced. In Section 3, as a way of preparation for the analysis of Feyerabend's theory of progress, his pluralistic model of theory testing, revolving around the claim that a severe test of a theory *T* requires to take into consideration not only the available evidence, but also alternatives to *T*, will be illustrated. A special emphasis will be put on the mixed standing of Feyerabend's views on theory testing and proliferation, which although showcasing his Popperian ancestry (as recently emphasized by Bschor, forthcoming), also led him, by the mid-1960s, outside the falsificationist orthodoxy. In Section 4, Feyerabend's theory of progress as a steady increase of competing alternatives, wedded to his views on theory testing and proliferation, will be analyzed. In Section 5, some brief concluding remarks will be offered.

2. Popper's two theories of progress

The issue of scientific progress always played a central role within the philosophy of Popper, who famously took the growth of knowledge to be the most important problem of epistemology—one which, he claimed, "can be studied best by studying the growth of scientific knowledge" (2002a [1935/1959], p. XIX). As we shall see, in different moments he put forward two different theories of progress and the aim of science; nevertheless, Popper always maintained that scientific inquiry ought to proceed according to the principles of his proposed alternative to the inductivist view of scientific method, i.e., the method of conjectures and refutations.

According to Popper, the inductivist claim that scientific inquiry takes off with the accumulation of observations, from which theories are then inductively inferred, is plainly wrong: all life is problem solving, and inquiry in science, not unlike in everyday life, arts, politics, etc., is triggered by the researcher's attempt to solve

some problem by putting forward a theory, hypothesis, or conjecture. However, there is one feature that distinguishes the theories belonging to the domain of empirical science: scientific theories can conflict with experience in such a way that experience can prove them false. The basic tenet of falsificationism is then the view that the falsifiability of theories provides a criterion of demarcation—the falsifiability criterion—which allows one to tell science from non-science.

More precisely, let a basic-statement be a statement describing a singular fact, for instance, the fact that a certain swan is black. According to Popper's criterion of demarcation, a theory *T*—for instance, the theory according to which all swans are white—is scientific iff there are basic-statements with which *T* is incompatible, or equivalently, that are forbidden by *T*, and such that, if they were true, *T* would be false. Such basic-statements are called by Popper the 'potential falsifiers' of *T*, and constitute its 'empirical content'—that is, the amount of information concerning the world conveyed by *T*. The greater the empirical content of a theory *T*, the more interesting *T* is: a theory which is incompatible with many basic-statements and which, besides explaining already known facts, also makes surprising predictions, runs the risk of being falsified because it says many things about the world, and therefore qualifies, in Popper's jargon, as a bold conjecture.

Another basic tenet of falsificationism is that, once a theory has been proposed, scientists ought to severely test it, aiming at its refutation. The tests are performed by deducing from *T*—in conjunction with the so-called 'background knowledge'—predictions that are then confronted with the basic-statements accepted by the scientific community, which describe the available evidence (that is, basically, the observations and the results of experiments). If the predictions deduced from *T* are compatible with such basic-statements, *T* is said to have been corroborated by experience. However, according to Popper one can never attribute a positive probability to a universal theory, no matter how well corroborated: scientists embrace a corroborated theory as a satisfactory solution to the problem at hand only provisionally and tentatively, and proceed to subject such solution to further, more severe, tests. If the predictions deduced from *T* are incompatible with the accepted basic-statements, *T* is said to have been falsified, and it should be replaced by some new conjecture providing scientists with an as yet untested, but presumably more satisfactory solution to the problem that they are investigating.

The method of conjectures and refutations revolves, unsurprisingly, around the falsifiability criterion, which Popper characterized as the "supreme rule" (2002a [1935/1959], p. 33) of his methodology: all the other rules that he devised follow from it, although not in a strictly logical or deductive way, but rather in the sense that, taken together, they are aimed at guaranteeing that no scientific statement will be protected against falsification.¹ The falsifiability criterion is, Popper claimed, "a proposal for an agreement or convention" which ought to guide the activity of those who hold dear such values as critical discussion and freedom from dogmatism, and are therefore moved by the desire to tackle "new and unexpected questions, challenging us to try out new and hitherto undreamed-of answers" (2002a [1935/1959], p. 15). Therefore, in *The logic of scientific discovery* Popper put forward his *first theory of progress*, according to which science pursues an "infinite yet attainable aim: that of ever discovering new, deeper

¹ Besides openly acknowledging the prescriptive character of his methodological rules, Popper insisted on the descriptive adequacy of the method of conjectures and refutations, i.e., on the fact that it captures the best practice of great scientists. For a discussion of some problems facing Popper's view of methodology, see e.g., Preston (1994).

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