

Feyerabend, Paul (1924–94)

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Abstract

Paul Feyerabend (1924–94) was a philosopher who gained recognition for his views on science and the role of science in society. Feyerabend is best known for his epistemological anarchism, the critique of the privileged position of science in society, and his endorsement of relativism. He made several contributions to the history and philosophy of science by studying the incommensurability of scientific theories and pluralistic nature of science, offering a new interpretation of the Scientific Revolution. His critique of classical empiricism and formal accounts of rationality remains his legacy in social studies of science and contemporary philosophy of scientific practice.

Paul Karl Feyerabend (born in 1924 in Vienna, died in 1994 in Genolier, Switzerland) was an Austrian-American philosopher who gained recognition for his views on science and the role of science in society. Feyerabend is best known for his epistemological anarchism, the critique of the privileged position of science in society, and his endorsement of relativism. Within the history and philosophy of science he is regarded as one of the preeminent critics of the ‘received view’ of Logical Empiricism and, later, Critical Rationalism.

Feyerabend enrolled at the University of Vienna studying mainly physics and philosophy, receiving his PhD in philosophy in 1951. He studied with Karl Popper at the London School of Economics the following year. Because of dim prospective academic chances in Austria, he accepted a position in Bristol, UK in 1955. From there, he accepted a permanent position at UC Berkeley in 1959, which he maintained till 1990. While in California, he accepted temporary positions at universities around the world, including the 1980 tenure at ETH Zürich, where he resigned in 1991. He died of a brain tumor only a few years later, in 1994, near Geneva.

His academic contributions range over a wide array of areas and topics: In general philosophy of science, he introduced the concept of incommensurability of scientific theories and, building on Karl Popper’s falsificationism, developed several arguments for theoretical pluralism in the methodology of science; he later severely criticized mainstream philosophy of science for its shortcomings. In epistemology, he developed a behavioristic account of basic sentences and constructively discussed several problems of empiricism. In philosophy of mind, he is known for proposing eliminative materialism as a possible solution to the mind–body problem. In analytic philosophy of language, he delivered an early interpretation of Wittgenstein’s *Philosophical Investigations* and a meta-philosophical critique of linguistic analysis. In the philosophy of physics, he first criticized the so-called Copenhagen interpretation of quantum mechanics, but soon came to appreciate aspects of Niels Bohr’s scientific work and was influenced by David Bohm. Closely related to his interest in physics, in history of science, he contributed studies on the early development of quantum mechanics, put forward a controversial interpretation of the establishment of Copernicanism in the sixteenth century, and wrote a series of studies tracking the rise of rationalism in the Western history of ideas. He also highlighted the similarities between the history of science and art

history as historically interwoven crafts. Additionally, he wrote about dramatics, commenting on Bertolt Brecht and Eugène Ionesco, and in political philosophy developed liberal ideas founded on John Stuart Mill and libertarian thought.

Although his patchwork-like philosophical works and writing style defy any easy systematization, there have been a number of proposals identifying common themes in Feyerabend’s work. For one, his early allegiance to Popper’s Critical Rationalism has been interpreted as an attempt to develop a systematic model of knowledge acquisition, furthering falsificationism, while also taking his cue from Wittgensteinian ideas. His later philosophy is, then, the result of relinquishing such a model, while developing early arguments to unwarranted extremes and adopting postmodern views (Preston, 1997). On another account, disparate works of his can be coherently grouped as sophisticated critiques of cases he viewed as manifest or lingering examples of conceptual conservatism in philosophy and the sciences. On this view Feyerabend – in true skeptical fashion – lacked allegiance to particular philosophical positions, employing them only instrumentally as *ad hominem* arguments against specific cases of conservatism (Oberheim, 2006). A third account highlights the roots of his views in the Viennese tradition of scientific philosophy, giving particular prominence to his early philosophy and later defense of scientist-philosopher Ernst Mach. On this view Feyerabend remained a distinctive ‘Viennese philosopher’ throughout his life, who furthered views pertaining to the intellectual and scholarly tradition of Central Europe (Stadler, 2008). Related to this interpretative scholarship, a more evaluative perspective has advanced charges of irrationalism (Stove, 2006) and postmodernism (Preston, 1998) against his later work, as well as defenses against these charges (Farrell, 2003, 2001).

From a sociological point of view, his influence within academe has been twofold. Staying in close contact with Karl Popper and collaborators allowed him to interact with like-minded scholars, though increasingly pernicious group dynamics led him to distance himself from the Popperian school, thus breaking with foremost academic interlocutors based at the London School of Economics (Collodel, forthcoming). Feyerabend also felt intellectually at home with the Minnesota Center for Philosophy of Science, led by Herbert Feigl (Stadler, 2008). Starting in 1957, he submitted several of his ideas to interdisciplinary scrutiny at the Center,

contributing to his fame as a rising star in the philosophy of science. However, with the broad exposure of *Against Method* in 1975 his more provocative ideas were received overwhelmingly negatively in the field of analytic philosophy of science, leading to vitriolic responses by Feyerabend and to a separation from the field. All the same, Feyerabend continued to receive job offers in philosophy of science from prestigious universities, permitting him to work unconstrained from particular allegiances, though, lacking a definite community. His legacy in philosophy has been similarly limited by the fact that he supervised very few students. Curiously enough, while the discussion of his work in philosophy decreased, central ideas found in Feyerabend's work – such as the pluralism and disunity of science – became commonplace in contemporary history and philosophy of science and scientific practice (Cartwright, 1999; Dupré, 1995). With similar dynamics, debates about expertise, democratic decision-making, and epistemic justice play a central role in contemporary philosophy of democracy and public policy (Kitcher, 2011, 2003) and epistemology (Fricker, 2009), but rarely acknowledge Feyerabend.

The exposure of his ideas in disciplines other than philosophy grew all the same, leading to notoriety outside the academe. Feyerabend has been widely read and referenced as one of the main theoretical resources in the post-Mertonian sociology of scientific knowledge (SSK). Backing away from Merton's 'weak program,' the emergence of social studies of science found the epistemological critique of 'postempiricist' philosophy of science by the likes of Feyerabend, Thomas Kuhn, and Richard Rorty to be a congenial framework for their approaches to science. While Feyerabend did not take active part in this reception, both the later Feyerabend and SSK shared an interest in anthropological approaches and conceptualized the ethnologist's view as a model of inquiry for their own studies.

Scientific Philosophy and Methodology

Feyerabend's early philosophical efforts were directed at reworking empiricism into an antifoundationalist enterprise, in which rock-bottom experiential certainty is given up in favor of overall testability and comprehensive corrigibility. His philosophical proposals grew out of scientific philosophy, aided by empirical findings of the sciences, logical analysis, and a deflationary strategy applied to philosophical concepts, which prompted to reinterpret major concepts of traditional philosophy (such as 'observability' and 'realism') as public dispositions of cognitive agents. Feyerabend used this behaviorist strategy time and again to make philosophical terms accessible to empirical analysis, to subject them to pragmatic reasoning about means–end relations and, more specifically, to include the cognitive agent in a third-person perspective as a necessary component of a scientific account of empiricism.

The behaviorist strategy opens the way for a distinctive conception where methodological rules can be interpreted as behavioral norms for attaining given epistemic aims in science. This conception of philosophy of science presented a line of action to approach an issue in his philosophy: the distinctive

role of decisions in science. Perhaps surprisingly, the early Feyerabend cherished the distinction between 'facts' and 'conventions' or 'conventional decisions' in science. The distinction may be understood as discerning matters determined by fact and matters underdetermined by fact, i.e., not to be settled by reference to matters of fact alone, and thus open to decision. While the distinction is usually employed to underline the factual, stable content of science, Feyerabend used it to stress how many instances are a matter of decision and, therefore, show the pliability of science by human volition. This, in turn, was mirrored in his philosophy of science, which, as scientific philosophy, was after all conceived as being modeled after science. Methodology both exploits this freedom and tames its potential arbitrariness by devising means to end relations between freely available epistemic aims and the constrained possibilities to attain them: which avenues lead to certain epistemic aims? The behaviorist account further fleshes out the means: how should scientists act in order to achieve a given epistemic aim?

Feyerabend's early methodological efforts are focused on empiricism and the testability of scientific theories as a fundamental epistemic aim of science. The earliest analysis of empiricist accounts of science, found in his dissertation (1951) and later developed in 1958 and 1962, targets foundationalist accounts in Logical Empiricism. His notion of testability crucially builds on Popper's notion of empirical content where the empirical content of a universal statement is given by the class of its potential falsifiers. The larger the class of potential falsifiers, the greater its empirical content and thus testability (or, in Popper's terminology, falsifiability). Several distinct topics discussed by Feyerabend, like realism and instrumentalism, theoretical monism and pluralism, incommensurability and conceptual conservatism, are tied together by a simple methodological question: which avenues directly or indirectly increase or decrease the testability of scientific theories? Even though these issues may not be settled by appeal to matters of fact, they can be settled methodologically: if one is an empiricist, he argues, exactly those avenues which increase testability should be adopted, while those views which decrease testability should be dismissed. (The important presupposition here is that these issues can be sharply determined by appeal to epistemic aims.)

Feyerabend's early criticism targets: theoretical monism, the view that the reduction (or elimination) of concurring scientific theories is an indication of scientific progress; instrumentalism, the view that scientific theories are only predictive devices; and conceptual conservatism, an umbrella term introduced by Oberheim (2006) to collect several arguments devised to constrain future conceptual development by appeal to allegedly stable structures of components of our knowledge and language. Feyerabend goes to great length to show that the adoption of these views indirectly or directly decreases the testability of scientific theories and should therefore be opposed by 'good empiricists' (Feyerabend, 1963). Conversely, Feyerabend presents distinct arguments to show that the adoption of theoretical pluralism, realism and allowing for radical reconceptualizations increase the testability of scientific theories. The following sections examine these topics in more detail.

Pragmatic Theory of Observation

In the late 1940s, within the Kraft Circle, Feyerabend became interested in the Vienna Circle discussion of the early 1930s concerning the question of the empirical basis of science. (This discussion, known today as the protocol sentence debate, appeared as written articles in the journal *Erkenntnis*.) The discussion revolved around the following problem: Supposing that empirical sciences can be understood as a system of sentences, how should the subset of basic sentences (usually observational statements) that are used to test further sentences (usually theoretical statements) be demarcated and characterized?

Feyerabend's contribution, which he dubbed a causal or pragmatic theory of observation, was first presented in print in 1958 and then in 1962, yet it was already developed in detail in his unpublished dissertation (1951). His contribution is a behavioristic account of basic sentences according to which sentences uttered by an observer under certain circumstances are public dispositions of that observer. Instead of relying on phenomenal certainty of experience by appealing to phenomenalism or sense-data epistemology, which he finds empirically and logically flawed, Feyerabend's account is explicitly cast to end the 'special' treatment of human observers, by putting them on a par with other scientific instruments, whose capacities have to be checked and calibrated like any other part of the scientific process. According to the pragmatic theory of observation, in order to assess whether the sentence uttered by an observer is an observation sentence, it is necessary to assess how reliably this linguistic disposition is correlated with the presence of some state of affairs that is being observed. Feyerabend's behavioristic proposal models epistemic agents as sensible measuring instruments, which under certain conditions react in a certain way – the utterance of sentences being one such reaction. "We arrive at an empirical theory," Feyerabend writes, "which resembles in many respects the theory of thermometers. [...] The theory establishes how reliably we can infer that 'something' exists from the fact that this 'something' is 'immediately given' to an observer" (Feyerabend, 1951: p. 58). The theory tells us which conditions need to be fulfilled in order to establish a causal relationship between the utterance of an observer and some event.

It is important to notice that within Feyerabend's account sentences uttered by an observer are simple physical facts, not interpreted linguistic statements. Feyerabend's analogy to thermometers, or measuring devices more generally, is meant quite literally. According to the pragmatic theory of observation, human observers are measuring devices just like thermometers. Like a scale signaling a certain value in correlation with a certain event, observation sentences are an observer's reaction (signal) to a certain stimulus (event). Whether the observer was reliably trained to raise her hand, simply growl, or utter the sentence "There's a blue flower" in reaction to such a stimulus is unimportant at this stage. Thus these utterances can be reliable indicators that something exists, but they alone do not give any indication of what exists – they are not yet descriptions of some state of affairs. They become descriptions only when being used in a theory, which provides their interpretation.

This account of basic sentences was extensively employed in Feyerabend's later papers under the label 'pragmatic theory of observation': "An observation sentence is distinguished from other sentences of a theory not by its content but by the cause of its production, by the fact that its production conforms to certain behavioral patterns" (Feyerabend, 1962: p. 36).

Theoretical Pluralism

Theoretical pluralism is the view that the proliferation of concurrent scientific theories is conducive to scientific progress and a sign of good scientific practice. Feyerabend thus counters the view that an ever growing limitation of concurrent theories is, instead, an indication and a desirable feature of scientific progress. This view, theoretical monism, figures in many accounts that view scientific progress as an advancing approximation to the one true theory. But Feyerabend also found the same view to be implicit in less idealized and more historical accounts, like Kuhn's *Structure of Scientific Revolution*, where theoretical monism is inscribed in the notion of paradigm, the necessary context in which normal science occurs. This aspect prompted Feyerabend to severely criticize Kuhn's model (Feyerabend, 1970a; Hoyningen-Huene, 2006).

The basic tenet of Feyerabend's theoretical pluralism is the *principle of proliferation* that scientists willing to increase the testability of established theories ought to "invent, and elaborate theories which are inconsistent with the accepted point of view even if the latter should happen to be highly confirmed and generally accepted" (Feyerabend, 1965: pp. 223–224). Feyerabend adduces many arguments to support this principle. The earliest and most technical is Feyerabend's contention that a specific class of observations may become actual falsifiers of an established theory only if they are part of a concurrent theory. In such cases, only the development of a concurrent theory can produce instances that may falsify the established theory. This means that the empirical content of a given theory can be augmented by developing and improving alternative theories. Feyerabend elaborated on this possibility by discussing e.g., the historical case of Brownian motion in physics. He contended that Brownian motion, while having been already a well-known phenomenon, became supporting evidence for statistical thermodynamics and a refutation of classical thermodynamics only with the advent of kinetic theory.

Feyerabend introduced a further principle of theoretical pluralism: "The principle of proliferation not only recommends invention of new alternatives, it also prevents the elimination of older theories which have been refuted" (Feyerabend, 1965: pp. 224–225). The latter he called the *principle of tenacity*. From early on Feyerabend interpreted falsificationism to extend to falsifying instances as well; and "testing a falsifying instance in all possible ways is just the same as trying out all possibilities of making it compatible with the proposed theory" (Hoyningen-Huene, 2006: p. 627). A fact inconsistent with the theory under scrutiny is not *ipso facto* a falsifying instance; it ought to be challenged by the very theory it is inconsistent with and it has to earn the right to become an actual falsifier. Yet "once a falsifying instance has been produced the theory falsified will have to go"

(Hoyningen-Huene, 2006: p. 627). The principle of tenacity goes further and invites to consider refuted theories as part of the realm of relevant theories: "The principle of tenacity is reasonable because theories are capable of development, because they can be improved, and because they may eventually be able to accommodate the very same difficulties which in their original form they were quite incapable of explaining" (Feyerabend, 1970a: p. 204).

Realism

Feyerabend has produced several arguments for a realistic interpretation of scientific theories. His realist position has puzzled many contemporary commentators, since his conception of realism does not resemble today's scientific realism; indeed, it denies central features of it. The disagreement in the early realism debate concerned almost exclusively the question of whether scientific theories should be taken at face value as truth-apt descriptions of the world. Proponents of a (strict or relaxed) verificationist approach would reject it ('positivism'), while empiricists repudiating verificationism would accept in various ways the claim that statements about theoretical entities could be truth-apt ('realism'). Thus the discussion was about semantic realism and both sides mostly agreed that epistemological and ontological considerations in support of realism – unlike today – were metaphysics to be rejected. From the perspective of today's scientific realism one can appreciate the latter position at best as a 'realist faction' in a principled empiricist framework. At that time, however, proponents in this tradition would self-identify as realists. Feyerabend's self-professed early realism must be positioned in this early context and interpreted in light of this early philosophical terminology.

In Feyerabend's realism his theoretical pluralism, critique of sense-data epistemology, the methodological nature of philosophy, come together. The earliest negative argument for Feyerabend's realism is that the alternative, namely positivism, is an untenable groundwork for empiricism. He simply shows that verificationist accounts of experience all rely on untenable sense-data epistemology (or equivalent accounts) thus blocking the main motivation to deny the meaningfulness of theoretical concepts. Theoretical concepts may be truth-apt after all. His positive argument for realism draws on his methodological understanding of the realism debate. Feyerabend's main arguments are pragmatic in character: "Is it useful to believe that scientific theories are true?" In this framework, the first premise of his argument for realism is that a realistic interpretation of scientific theories is conducive to maximize their testability (while instrumentalist interpretations reduce their testability). Since testability is a fundamental epistemic goal of the scientific enterprise (second premise), it follows that scientific theories ought to be interpreted realistically.

Feyerabend contends that allowing for a putative truth-value of statements about theoretical entities expands the class of potential falsifiers of the theory containing said statement, thus increasing its testability: simply put, if we take statements about theoretical entities to be truth-apt, those statements may turn out to be false. Under an

instrumentalist interpretation, by contrast, the theory's statements about unobservables are not truth-apt and, therefore, not capable of being refuted. And this is, indeed, Feyerabend's contention: under a realistic interpretation a theory's empirical content increases, while under an instrumentalistic one it decreases. (As new observations alone cannot refute unobservables, this demand crucially extends to the proliferation principle: only realistically interpreted alternative theories may posit theoretical entities contradicting the theory under scrutiny.)

Feyerabend's disavowal of this general realism advanced throughout the 1960s with his increasing skepticism toward general methodological rules. His studies made him aware of cases in which scientists would contravene general methodological rules with good scientific reasons, as dictated by the specific situation of their research. While Feyerabend would still take exceptions on general methodological grounds, he came to appreciate instances of local instrumentalism. A scientist by training, Feyerabend appreciated how such instances made him doubt the viability of his previous conclusion that scientific theories ought to be interpreted in a certain way no matter what the particular research situation is. Abandoning this general realism, he came to appreciate both locally justified interpretations and methodological rules tied to specific theories and research situations.

In the 1980s and early 1990s, Feyerabend's position regarding realism has been variously interpreted, ranging from a strong idealism cast in social-constructionist terms (Preston, 1998), to 'process-realism' (Farrell, 2001), to a sort of neoplatonism (Kidd, 2012). Having renounced his earlier scientism, i.e., the view that science gives us the only, or, at least, better means to attain knowledge about the world, Feyerabend extended his pluralism beyond science. For a time Feyerabend seems to have entertained the idea of an ontological disunity: different ways of knowing the world may hint at different realities being discovered. This definitely changed when he later introduced a strong metaphysical view about the unity of reality in the form of a 'Being' or simply 'Nature,' as he variously called it: The different realities that are discovered through radically diverse ways of knowing the world are, in fact, different ways in which the one ineffable Nature reacts to these discovery attempts. Further, Feyerabend questioned the assumption of a principled separability between the act of discovery and resulting entities or processes being discovered, arguing that the entities or processes being discovered may not exist independently of the circumstances of their discovery (Feyerabend, 1999).

Incommensurability

The term 'incommensurable' ('without a common measure') was first used in 1962 by both Paul Feyerabend and Thomas Kuhn to describe a specific relation – or lack thereof – between pairs of universal theories (Feyerabend) or paradigms (Kuhn) occurring in the history of science. Though Feyerabend's and Kuhn's accounts share some features and are directed against earlier accounts of scientific progress in philosophy of science, they were developed independently and are not easily reconcilable (Hoyningen-Huene, 2004).

Feyerabend's notion of incommensurability can be divided into different stages, starting from a logico-linguistic conception in the 1950s and ending with a hermeneutic-ontological conception in the 1990s. The possibility of incommensurability appears first as a counterfactual thought experiment in his dissertation (1951), but he only started to think about it as an actual phenomenon a few years later, finally leading to the best known and most discussed version of the incommensurability thesis of 1962.

The best known version of the incommensurability thesis states that mutually logically disjoint pairs of scientific theories present themselves as an actual phenomenon in the history of science and that this phenomenon is necessary for the ongoing development of science. The thesis was directed against accounts of intertheoretic reduction and explanation put forward by Logical Empiricism. It was argued that famous transitions in physics, from Galileo's law of free fall to Newtonian mechanics, and from the latter to Einstein's special theory of relativity, would adhere to this schema. The incommensurability thesis maintains that this account fails in exactly these paradigmatic situations. The main argument presented by Feyerabend in support of his refutation contended that the reduction relation presupposes a principle of meaning invariance across consecutive theories, such that the meaning of central theoretical terms in the former theory, as well as the meaning of observational terms, would be retained in the newer theory. This principle, however, does not obtain when considering pairs of realistically interpreted universal theories, because the meaning of central theoretical terms and the meaning of at least some observational term of the older theory is not retained by the successive theory. Instead of reducing or explaining the older theory, the newer theory replaces it. While Feyerabend conceded the later theory would often retain the previous theory as a limiting case, the former would just retain a numerical surrogate of the latter, not its conceptual apparatus. Still, Feyerabend maintained that the proliferation of incommensurable theories is essential for the progress of science as they instantiate the strongest case of alternative theories that may mutually contribute to the increase of their respective empirical content, aiding theoretical pluralism.

The logico-linguistic version of the incommensurability thesis sparked a strong debate that targeted the tenability of the very concept of incommensurability as well as its application to specific cases in the history of science. Among the objections were the rivalry objection (How can two theories be both logically disjoint and yet contradict each other?) and the relevance objection (How can two incommensurable theories be said to apply to the same empirical domain?). Feyerabend replied to these objections throughout the 1960s, trying to correct what were to become long-lasting misreadings like the contention that incommensurability implies incomparability between scientific theories, a misreading far from Feyerabend's view. In fact he maintained that incommensurable alternatives, while being problematic for formal philosophical accounts of scientific development, give a variety and *better* means of comparing the merits of theories. However, under pressure and becoming increasingly dissatisfied with his own precisations, he finally gave up trying to devise a precise account, declaring to be unable to formulate such an account.

Nevertheless, he did not give up the concept itself, maintaining that incommensurability has an important explanatory and descriptive role to play in the history of ideas and cultural practices. Starting with the introduction of epistemological anarchism, he recast incommensurability as a historical-hermeneutical thesis to be shown – rather than proved – by means of historical-anthropological analysis in subsequent frameworks of thought, in changes of perception frameworks as well as in styles in the figurative arts and in poetry.

Epistemological Anarchism

Feyerabend's epistemological anarchism (or Dadaism) was first advanced in 1970. Its central thesis is that methodological rules have only limited validity and application in science or, more generally, that science is governed by a liberal practice in which methodological rules are, at best, used as rules of thumb. This thesis is explicitly cast both in a descriptive and normative form: For one, historically, "[w]e find [...] that there is not a single rule, however plausible, and however firmly grounded in epistemology, that is not violated at some time or other" (Feyerabend, 1993: p. 14). Second, "[t]his liberal practice [...] is not just a fact of the history of science. It is not merely a manifestation of human inconstancy and ignorance. It is reasonable and absolutely necessary for the growth of knowledge" (Feyerabend, 1993: p. 14). A third, often ignored, but not less important motive is the ethical grounding of his proposal: "Such an anarchistic epistemology [...] is not only a better means for improving knowledge, or of understanding history. It is also more appropriate for a free man to use than are its rigorous and 'scientific' alternatives" (Feyerabend, 1970b: p. 21).

Feyerabend supports his thesis with a detailed study of the Scientific Revolution and the rise of Copernicanism in the sixteenth and seventeenth century. The study purports to show that Galilei's defense of the heliocentric hypothesis violated basic tenets of modern scientific methodology and that it followed through exactly because of this violation. Feyerabend also purports to show that the opposing party, personified by Cardinal Bellarmine, argued against the heliocentric hypothesis on the basis of sound empiricist tenets. Concurrently, and even more controversially, the Church is interpreted as recommending the evaluation of the view of experts in the light of social and ethical values, whereas Galileo is seen as advocating *ante litteram* the acceptance of a privileged role of experts in society. The conclusion Feyerabend draws is twofold: Galilei could not have successfully defended the heliocentric hypothesis at the time without violating basic tenets of empiricism; and the opposition to Galilei, the Roman Catholic Church in particular, had good scientific and ethical reasons on their side to reject Galilei's scientific venture. Feyerabend's choice to use Galilei as a case study is crucial for his argument. If Galilei, the epitome of the modern scientist fighting against obscurantism, did not act according to the standard scientific methodology, who could possibly have? Because the Scientific Revolution has been viewed as the paradigmatic example of scientific progress, a revisionist historical-philosophical account, if correct, casts doubt on the usefulness of conventional accounts of scientific progress. In this way Feyerabend wants to generalize from a single but paradigmatic case to the scientific enterprise as a whole.

Because of its unabashed provocative claims, several charges have been leveled against Feyerabend's theses. Some have been unanimously identified as relying on misconceptions or misunderstandings of his work; other have been substantiated. For one, Feyerabend's conclusion has been read as against Galilei's scientific achievement or, alternatively, against the notion that Galilei's defense of heliocentrism was justified. Quite the contrary, Feyerabend's goal is to uphold Galilei's scientific achievement and to show the inadequacy of standard accounts of scientific rationality. Second, Feyerabend's intention has been interpreted as proposing a new anarchistic methodology to replace the empiricist one. This is arguably not the case: "My intention is not to replace one set of general rules by another such set: my intention is, rather, to convince the reader that *all methodologies, even the most obvious ones, have their limits*. The best way to show this is to demonstrate the limits and even the irrationality of some rules which she, or he, is likely to regard as basic" (Feyerabend, 1970b: p. 21).

The latter misconception arose because Feyerabend did not just show cases of basic empiricist rules being violated, but he affirmatively formulated and defended the use of increasingly heterodox methodological rules in science. Starting with the proliferation principle, later complemented by the tenacity principle, Feyerabend liberalized methodology, leading to the formulation of counterinduction as an additional rule of thumb stating that it may be useful to introduce hypotheses that are inconsistent not just with established *theories* – as the proliferation principle suggests – but with well-established *facts*. But counterinduction is not meant to be a new methodology. Indeed, Feyerabend's analysis of Galilei's scientific practice purports to show that Galilei proceeded counterinductively on several occasions. And it is not introduced to supplant existing methodological rules: proceeding counterinductively is suggested "*in addition to* proceeding inductively" (Feyerabend, 1970b: p. 26).

The catch phrase associated with epistemological anarchism is 'anything goes.' Though it appears only once in the book, it has been used ever since as purportedly expressing the main principle of Feyerabend's epistemological anarchism. This is arguably mistaken. Feyerabend introduces 'anything goes' as a rhetorical device, distilling the only principle an advocate of methodological monism could possibly uphold in the face of the pluralism to be found in science and its history. But his point is to show that such a principle would be empty, and thus implies to abandon monism and an invitation to accept pluralism – 'many things go' – not to adopt an empty methodological rule.

More substantive objections have been made to Feyerabend's historical interpretation of Galilei's undertaking and his argument with the Church. Since Feyerabend did not produce new historical material, these objections pertained to Feyerabend's handling of the available historical material and the cogency of the conclusions he drew from it (Machamer, 1973; McMullin, 1970). Whether this invalidates Feyerabend's pluralist conclusion as well is open to debate.

While epistemological anarchism has been viewed as a radical departure from his earlier views, the actual change is rather subtle, at least when compared to the strong consequences Feyerabend drew from it. The increasing skepticism toward general methodological rules was prompted by the

raising awareness that philosophical issues in the sciences may at times not be resolved by appealing to general methodological rules, but be forced upon by the circumstances of specific research contexts. Nevertheless, methodological rules do not become useless in Feyerabend's analysis, they merely lose generic means of justification and become subject to context-dependent justification. Feyerabend's methodological pluralism embraces the different contexts of scientific research, analyzing which epistemic values were adopted and why they were adopted in given contexts.

Philosophy of Nature and the Rise of Rationalism

Against Method's main claim that the rationality of science is incompatible with its 'rational reconstruction' leaves open at least two options. The failure of standard accounts of rationality to account for science and its progress "means either that there cannot be any discoveries unless one leaves the house of reason, or that the house of reason is very different from what philosophers and other idea-mongers make it out to be" (Feyerabend, 2011: p. 112). The success of *Against Method* and its vitriolic rhetoric lent credibility to the idea that Feyerabend went with the first option, instead of hinting at his true intentions of giving a detailed account in which way(s) 'the house of reason' might differ from formal philosophical accounts, a project which was published only posthumously (Feyerabend, 2009).

In his final writings, he relented the acrimony of his earlier works, giving way to an unsystematic resumption of his project to describe 'the rise of rationalism' and to give an alternative account of scientific and nonscientific rationality and the relationship between the two (Feyerabend, 2011, 1999). In these works, he invites the reader to rethink the relationship between the empirical and theoretical dimensions of human agency, science being one such activity among many. While an abstract notion of knowledge, namely theoretical knowledge, is necessary to science, it is not sufficient, as science only succeeds embedded in specific practices. Indeed, his claim is that the theoretical dimension is but a kind of particular practice. Science is, therefore, best understood as a theoretical and practical craft.

Democratic Relativism

Feyerabend's strong ethical commitment and his considerations about the close relationship between morality and knowledge, between ethics and epistemology, are documented long before his more controversial pronouncements in *Science in a Free Society* (see Feyerabend, 1961). Yet they turned into more global considerations about science and society only with the advent of *Against Method*, borrowing from political philosopher John Stuart Mill and other thinkers. In particular, he applied Mill's insights in *On Liberty* (1859) to extend theoretical pluralism beyond science to other forms of knowledge, turning theoretical pluralism into global considerations about the necessity of a plurality of points of view and of traditions and the required conditions under which these points of view could develop and thrive (Feyerabend, 1987, 1978).

Feyerabend is best known for his positive appraisal of several social and philosophical theses which he subsumed

under the heading of relativism. ‘Relativism’ has long been used as a negative epithet in philosophy, rarely as a philosopher’s positive self-description. (For a recent philosophical reappraisal of Feyerabend’s relativism see [Kusch, forthcoming](#).) Not so in fields like anthropology and sociology of knowledge, where relativism has a long standing pedigree as a central methodological premise. Likewise, his target audience is clearly not the philosophical community anymore, but a more general learned audience.

At the core of Feyerabend’s relativism lies the ideal of a free society (a terminological choice polemically opposed to Karl Popper’s open society) in which all traditions ought to enjoy equal rights and opportunities. (This he calls ‘democratic’ or ‘political’ relativism.) Feyerabend’s central move is twofold: To conceptualize science as one tradition among many and to renounce even a moderate form of scientism, the view that science gives us better means to attain knowledge than other traditions, which lies at the basis of the scientific worldview. Yet this does not imply that all traditions’ beliefs are equally true or false (a view which Feyerabend calls ‘philosophical relativism’ and rejects). His main target is the predominant *political* and *social* role of science within today’s societies. While science is the only one among many traditions, the scientific worldview stipulates that science mediates and is introduced as an arbiter into the discourse among traditions, i.e., has a privileged position in collective social–political decision-making process. According to democratic relativism, this privileged position is incompatible with the flourishing of a plurality of traditions. Also, science is given the power to stipulate the very rules that govern the interchange between traditions. To exemplify his proposal of a free society and the role of experts therein, Feyerabend draws an analogy to courts of law in which citizens are judged by a jury of peers ([Feyerabend, 1978](#): p. 97). While experts may be called to testify, they do not necessarily have an exceptional standing and are one factor among many leading to the final verdict that is deliberated and agreed upon by a group of peers. In a similar way, a free society urges that citizens should have the final say in social–political decision-making.

See also: Conventions and Norms: Philosophical Aspects; Critical Rationalism; Democracy: Normative Theory; Knowledge (Explicit, Implicit and Tacit): Philosophical Aspects; Kuhn, Thomas S. (1922–96); Liberalism: Historical Aspects; Logical Positivism and Logical Empiricism; Mill, John Stuart (1806–73); Objectivity: Philosophical Aspects; Physicalism and Alternatives; Postmodernism: Philosophical Aspects; Relativism: Philosophical Aspects; Science, History of; Social Constructivism; Vienna Circle: Logical Empiricism; Wittgenstein, Ludwig (1889–1951).

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Relevant Website

<http://www.collodel.org/feyerabend/> – The Works of Paul K. Feyerabend by Matteo Collodel (accessed 11.07.14.).