### Philosophy of Nature by Paul Feyerabend, Cambridge: Polity Press, 2016, xxxii + 260 pp. £25.00 (hardback) ISBN 9780745651590

Paul Feyerabend was one of the most intriguing figures in the 20th-century philosophy of science. A student of Karl Popper, he came to stridently reject his former teacher's "rationalistic" view of science, and (in)famously endorsed an "anything goes" philosophy of science that he called "methodological anarchy." This position led him to be called an "enemy of science" by *Nature* magazine (vii).

The work under review here was not published during Feyerabend's lifetime. It is essentially the first volume "plus" of a projected three-volume work tracing the development of the philosophy of nature from paleolithic times, through the ancient Greeks, and up to recent developments in relativity and quantum mechanics. Volume one was projected to finish with the pre-Socratics, volume two would run from Plato up through the Renaissance, and volume three would run from there to the present day. Volumes two and three have been rolled into volume one here in the form of much briefer chapters from what were intended to have been book length works. But even in this truncated form, this book presents a new face of the "gadfly" Feyerabend to the philosophical community: that of the serious scholar of the history of philosophical thought.

Feyerabend's starting point, the neolithic understanding of nature, is important in that historians and philosophers of science have seldom regarded the "primitive" knowledge of nature as anything more than ignorance and superstition (see Wootton, 2015, for a representative example). That is a view Feyerabend vigorously rejects. For instance, he writes:

The assumption that humans of the Stone or Bronze Age would have had only the most primitive knowledge of nature may be flattering to our progressivist self-image. But it has little plausibility since Stone Age humans were already fully developed members of the species *Homo sapiens*, and it is incompatible with recent research. The environmental and societal problems that the early *Homo sapiens* had to face were incomparably greater than the challenges facing our contemporary scientists. These problems had to be solved with the most primitive means, often without any division of labor or specialized skills, and the solutions arrived at indicate a level of intelligence and sensitivity that is clearly not inferior to ours. (5-6)

He insists that we take the neolithic view, which he sees as persisting up through the time of Homer in the Greek world, seriously: these people really did have the experiences the historical evidence indicates that they had:

An animated world, divine intervention, the 'openness' of the soul's life are not preconceptions or errors or results of a superficial approach, but clearly recognizable components of this experience of the world, and their elimination constitutes an elimination of important knowledge. (90)

However, Feyerabend asserts, we see the signs of the breakdown of this understanding of the cosmos even in Homer, and the breakdown becomes more pronounced in Hesiod, and in the pre-Socratic philosophers. In a sense, the philosophers "rationalized" cosmology, but they did so only by excluding large parts of experience:

Thus, Anaximander's universe and its later modifications are uniform. And yet they are not complete. They do not contain mythological events, dreams or spawns of imagination... We push the events in question out of our physical world and into another world, which is conceived of either as a world consisting... of non-reality, or as a very real yet non-physical world... In both cases we obtain an antiseptic real (physical) world at the expense of insurmountable problems: how can we reunify domains that are so radically separate? Increased specialization makes the problems disappear from the researchers' horizon... (126-132)

Indeed, the purported "rationality" of the view emerging with the Greek philosophers does not stand up to empirical scrutiny:

the disappearance of the gods... today... is generally regarded as 'rational'... Yet this means identifying rationalism with materialism -- a dubitable procedure based on a naive naturalistic interpretation of the material. It indicates an oversight of the possibility that materialism may have contradicted the contemporary experience of the world, and so it may be considered 'irrational' in light of an empiricist methodology. (105)

Feyerabend argues that, in the new philosophy of nature, abstractions came to be seen as more real than concrete reality, pointing out that, for instance, in Parmenides we already see "reality" being assigned to paradoxical, abstract notions, rather than to concrete experience. Per Feyerabend, far from fixing this situation, modern science has simply hardened it in its institutional structures:

The rift was never entirely overcome; rather, the 'real world' became ever more remote from the world in which we live and feel. It becomes institutionalized until eventually the power of the growing institutions of science and an education regulated by them closes the rift from the other end by means of a kind of training that keeps transforming intuition, the behavior regulated by it, and thereby us humans as well until we obey the scientific forms of thought and see the world through them, as a junk room deserted by gods yet well organized. (153)

Feyerabend goes on to describe how this new attitude to nature, one that cleaves the world of experience into a "subjective" realm that includes dreams, myths, emotions, and even sense qualities, and an "objective" realm consisting only of what can measured and thus quantified, gradually hardened into a "fundamentalist" epistemology disconnected from the actual practice of science:

Though there is a lot of talk about the new and fertile foundation that Descartes, Galileo, and Newton introduced and used in their research, such a foundation cannot be found in practice... we now have a fundamentalist epistemology and entirely separate practice of research in philosophy of nature and science. This antagonism and the related irrationality of modern science is hidden by a slanted method of representation, which depicts even the most revolutionary discovery as resting on a solid foundation. (173-174)

A common myth about the Scientific Revolution is that it represented a turn from ungrounded speculation to theory based solidly upon facts. However, as Feyerabend notes, Galileo criticized Aristotle for relying too much upon the experience, and paying insufficient attention to speculative reason! He quotes Galileo (from *On Motion*):

[Aristotle] asserted [his theory of motion] on the basis of no other reason than experience... But, to employ reasoning at all times rather than examples (for what we seek are the causes of effects, and these causes are not given to us by experience)... (182)

As mentioned earlier, what we have in the published product is a fairly complete work up through the pre-Socratics, but is much more abbreviated from that point on. Neverthless, we are offered tantalizing glimpses into Feyerabend's understanding of modern philosophy of science. He is clearly an admirer of Hegel's thought, especially his dynamical view of our concepts themselves, Hegel's effort to overcome the "rigidity of classical science" (186). His extensive quotations from Engels and Lenin in the section on Hegel illustrates, as a sidelight to his main points, how seriously Marxist thinkers studied Hegel.

In his section on Newton, Leibniz and Mach, Feyerabend stretches back to analyze Leibniz and Berkeley as precursors of Mach's critique of the Newtonian worldview. He regards Berkeley as "the acute precursor of modern positivism," and considers his work "On Motion" as "a masterpiece" (193). He notes that Newton's physics required the continual intervention of God to stabilize the world, an understanding Leibniz and Descartes rejected. Mach was even more radical, insisting that "the mechanistic notion of nature had no foundation in experience and needed to be eliminated" (196).

The final section dealing with modern philosophy of nature sees Einstein, Bohr, and Bohm as "signs of a new era" (197). The triumph of field theories, which do not sit easily in any mechanistic worldview, was the beginning of the end for mechanism. Einstein's theories rejected the absolute space and time of Newton, and understood space as relational and relative. Bohr was even more radical, and assigned "the subject a crucial role in the shaping of natural phenomena" (200). And for Bohr, as Feyerabend understands him, the dissolution of classical physics cannot be replaced by some new synthesis: "We have to be content with the *ruins* of the classic worldview" (201).

Bohm (whom Feyerabend notes was deeply read in Hegel) and his allies represent a reaction to Bohr, given that they "deliberately placed the idea of an objective description of nature at the top of their preferences" (202), although in a manner hardly compatible with the mechanistic framework. Feyerabend clearly approves of these recent developments, since the mechanistic approach "pushed aside... a large number of obvious facts [such as the] independent existence of the soul [and] mental powers that are independent of matter" (203). He concludes by welcoming the onset of a "new philosophical and mythological science" (207) that will be more fully human than the mechanistic science it is replacing.

The book then includes several letters that Feyerabend wrote, to colleagues and others interested in his plans, that shed some light on its main body. Curiously, at some points, these seem to contradict the primary text, for instance, when Feyerabend criticizes the views of "savages" (217). But that letter was written much earlier than the central text, and possibly his view evolved.

Feyerabend's research presented in this volume provides us with a fascinating insight into the serious historical contemplation that lay behind his "anarchic" methodological stance. One need not accept all Feyerabend's conclusion to appreciate that he was correct in noting that, despite all the scientific wonders that the new view of nature has brought us, important aspects of human experience were marginalized during its rise to dominance.

### Bibliography

* Wootton, David. *The Invention of Science: A New History of the Scientific Revolution*. Harper, 2015.

Gene Callahan

New York University

ejc369@nyu.edu