

FEYERABEND'S METAPHYSICS: PROCESS-REALISM, OR VOLUNTARIST-IDEALISM?

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SUMMARY. John Preston has contended that Paul Feyerabend retreated from his earlier commitment to realism and consciously embraced a 'voluntarist', social constructionist, idealism. Though there seems to be unmistakable subjective idealist statements in some of Feyerabend's writings, it will be argued that Feyerabend's idealistic period was short-lived, and that he returned to a form of realism in his later writings. Specifically, Feyerabend's distinction between theoretical/abstract and empirical/historical traditions of thought, when understood with Feyerabend's reevaluation of Bohr's philosophy of quantum physics in mind, is most aptly interpreted as a process realist position. Preston, in interpreting Feyerabend as a voluntarist, social constructionist, subjective idealist, fails to distinguish the ever-present rhetorical and provocative statements of Feyerabend's from the core arguments being presented.

Key words: metaphysics, realism, scientific-realism, process-realism, voluntarist-idealism

1. INTRODUCTION

John Preston has contended that Paul Feyerabend, in his later philosophy, retreated from his earlier commitment to realism and consciously embraced a 'voluntarist', social constructionist, idealism. (Preston, 1997, 421–31.) Thus Preston sees Feyerabend's career in terms of an early, robust, realist period in the fifties and sixties; followed by a transitional period, still realist, but slipping; and finally, an idealist, social constructionist period, in place by Feyerabend's 1978 book *Science in a Free Society*. Preston seems to say that since 1978 Feyerabend embraced idealism ever more whole-heartedly; right up until his death.

I contend that Feyerabend's intellectual biography exhibits a markedly different trajectory than that which Preston attributes to him: I accept that there was a robust realist period; followed by a transitional period, though whether this transitional period had anything to do with a weakening real-



ism is a moot point; and a third, idealistic, period exemplified by Feyerabend's 1978. Here, for example, we find Feyerabend claiming that

we certainly cannot assume that two incommensurable theories deal with one and the same objective state of affairs ... Hence, unless we want to assume that they deal with nothing at all we must admit that they deal with different worlds and that the change (from one world to another) has been brought about by a switch from one theory to another ... Speaking in this manner we no longer assume an objective world that remains unaffected by our epistemic activities ... We concede that our epistemic activities may have a decisive influence even upon the most solid piece of cosmological furniture - they may make gods disappear and replace them by heaps of atoms in empty space. (1978, 70.)

This is certainly, unmistakably, voluntarist/subjective idealism; as it stands, it is quite absurd. But here we must part company with Preston's analysis: this third, idealistic, period was relatively short-lived. I will contend that Feyerabend had a fourth period which saw him return to realism: a realism in keeping with his general philosophy; critically affected by his dalliance with idealism and radical relativism; but ultimately derived from Feyerabend's late sixties reappraisal of Bohr's interpretation of quantum physics. Thus Feyerabend's later philosophy can be seen as a belated coming to terms and absorption of the lessons of quantum physics. Feyerabend's reappraisal of Bohr's interpretation of quantum physics was one of the integral causative factors in his transition period; consequently, Feyerabend's post-1978 philosophy can be seen as the ultimate culmination of a process begun in the late sixties.

2. TWO TRADITIONS: THEORETICAL/ABSTRACT VERSUS EMPIRICAL

Feyerabend's return to realism can be traced to as early as 1981: the new material written for his philosophical papers exhibit a clear balancing of realist and relativist 'argumentative chains', and an introduction of the concept of a theoretical/abstract versus empirical/historical dichotomy of traditions. (1981a, vi-xii; 1981b, 1-33.) By the time of *Farewell to Reason* (1987) this dichotomy looms large in Feyerabend's thought.

Theoretical traditions, which Feyerabend sees exemplified by Parmenides, Plato and modern 'Rationalists', is a tendency wherein

The members of theoretical traditions identify knowledge with universality, regard theories as the true bearers of information and try to reason in a standardised or 'logical' way. They want to bring knowledge under the rule of universal laws. Theories, according to them, identify what is permanent in the flux of history and thereby make it unhistorical. (1987, 118.)

The appeal, and much of the justification, of a theoretical/abstract approach, consists in its use of logical proofs: if we want a complete, in-

terconnected, system of knowledge, then we need to be able to unambiguously demonstrate the interconnections between different parts of the system, and the consequences derivable from the system. The main attraction of such a position is that if you follow a given procedure, then the conclusion or end-product of this procedure will not only be rational, but also, hopefully, unique. But if the concepts involved in both the procedure itself and the subject matter to which the procedure is applied are ambivalent or ambiguous, then the conclusion or end-products of the procedure will be either ambiguous or multifarious: different people will interpret the ambiguous concepts differently; the hoped for unique rational end-product will not result. Consequently, to gain better results from proof procedures, concepts must be unambiguously defined: the commonsense multiplicity must be simplified and the core meaning abstracted from the putative accidental features given to concepts in everyday affairs.

But Feyerabend argues that if these procedures, harmless in themselves, and, in fact, a welcome addition to epistemic variety, are regarded as the sole source of true knowledge, then this is an unfounded, question-begging, claim:

We may agree that abstract notions and principles can be connected more easily than practical (empirical) concepts ... But the fact that simple ideas can be connected in simple ways gives the resulting propositions special authority only if everything can be shown to consist of simple things – which was precisely the point on which disagreements arose! (1987, 67.)

If concepts are complex and have different meanings and significance in every different situation in which they are applicable, then the idea of abstract concepts divests concepts of important aspects of their meaning: it creates a situation wherein the applicability and adaptability of concepts to varying situations is greatly curtailed.

If we look at the history of any concept we would like to choose, then we will find that concepts have continually evolved over time. For example, the concept of an atom is still used today, even though this concept has undergone radical changes over the millennia of its use: something of the infinite Parmenidean 'ones' of the original Greek atomists survived up to Dalton, but the subsequent development of the concept – from indivisibility, to divisibility, through the solar system analogy, to the current quantum-mechanical models – have left us with a concept of the atom with few similarities with that of the original Greek atomists. If we had been resolved to stick with the concept of the atom at any one stage in history, then the evolution and adaptation of the concept of the atom would have been delayed and obfuscated.

In contradistinction to theoretical/abstract traditions, Feyerabend presents the idea of empirical/historical traditions, or, equivalently, commonsense practical traditions. Empirical traditions

contain subtly articulated ontologies ... [where] each entity behaves in a complex and characteristic way which, though conforming to a pattern, constantly reveals new and surprising features and thus cannot be captured in a formula; it affects, and is affected by, other entities and processes constituting a rich and varied universe. (1987, 64.)

In a tradition of this sort, knowledge is “a collection of opinions, each of them obtained by procedures appropriate to the domain from which the opinions arose.” (1987, 72.)

The members of historical traditions emphasise what is particular ... They rely on lists, stories, and asides, reason by example, analogy, and free association and use ‘logical’ rules when it suits their purpose. They also emphasise the plurality and, via the plurality, the history dependence of logical standards. (1987, 118.)¹

The juxtaposition of such empirical traditions with theoretical traditions does not derive simply from the use of abstract concepts and abstract generalisations within theoretical traditions: no tradition, theoretical or empirical, can exist without abstractions and generalisations. Rather, it is the attempt to systematically organise all knowledge in the form of abstract concepts and abstract generalisations, and to then make the further implication that reality is identical with such abstract structures, which Feyerabend sees as the objectionable feature of theoretical traditions. “‘Problems of reality’ arise [only] when the ingredients of complex worlds of ...[the empirical, commonsense] kind are subsumed under abstract concepts and are then evaluated, i.e. declared to be either ‘real’ or ‘unreal’ on that basis” (1987, 64.) Feyerabend is claiming that there are many different aspects of reality. Theoretical traditions deny this plurality: theoretical traditions are predicated upon the idea of a metaphysical dualism between appearance and reality. The inherent multifariousness of sense experience, which gives rise to loose and adaptable concepts, is devalued in such a system and labelled merely appearance, while the universalisable and strict concepts derived through abstraction are considered to be indicative of reality. Feyerabend does not deny that theoretical/abstract traditions can realistically describe aspects of the universe. What Feyerabend denies is the contention that these aspects are the only realistic aspects of the universe.

Feyerabend is contending that there is an inherent multiplicity in reality and that there are two basic attitudes that we can take towards this multiplicitous reality: a) we can accept the abundance of facts and particulars given to us by our empirical experience of the world, both social and non-social, and hold a sceptical attitude towards overarching theories and abstractions.

Or, b) we can deny that reality is multiplicitous and try instead to look for abstract generalisations and regularities behind the particulars.

That Feyerabend is describing tendencies of thought with this theoretical/empirical dichotomy, rather than explicit traditions in themselves, can be illustrated with reference to Feyerabend's ideas on science. Science, as an activity, and a tradition, is exceedingly heterogeneous. Some scientists look for the ultimate abstract generalisations underpinning empirical experience, while other scientists are simply concerned with the outcomes of particular experimental situations. The distinction between theoretical and experimental physicists can be roughly interpreted along these lines. If we look towards the interpretation of science as a whole, then we find an analogous situation: philosophers have traditionally looked for the abstract, universal canons of rationality underpinning particular examples of scientific activity; on the other hand, in recent decades historians and sociologists of science have looked towards the idiosyncrasies of particular scientific episodes and denied that a universal abstract characterisation of science can be found. But the point to be emphasised is that science, as a tradition, is neither theoretical or empirical; rather, science contains aspects of both tendencies of thought, in both participants and observers. Feyerabend, of course, has championed the second type of interpretation of science. Even though Feyerabend applauds Aristotle because "Aristotle ... attempted a synthesis of historical and theoretical (abstract) thought" (1981b, 12), implying that this is the way to go, he nevertheless believes that the fact that science is neither theoretical or empirical, but both, is ultimately a meta-argument in favour of the empirical approach. We can make an Aristotelian analogy here: theoretical/abstract and empirical attitudes towards traditions, in their most extreme formulations, constitute the vices to be avoided, virtue is somewhere in between. However, in practical judgement of the right course of action it is better to lean towards the less pernicious vice.

Given this analysis, what then, for Feyerabend, is real? It would seem that he would want to deny the reality of abstract ordering schemes in favour of the multiplicity of ideas and concepts associated with an empirical attitude towards traditions and experience. The local, practical knowledge intimately tied to sense experience, though multitudinous, as the only reality. This position would seem to place Feyerabend much closer to his traditional logical empiricist opponents than anyone, including Feyerabend, would have thought imaginable. But I don't think that this is the conclusion we should draw. Feyerabend's commendation of Aristotle for what he thought was an admirable synthesis of theoretical and empirical tendencies implies that if Feyerabend were to deny reality to all

theoretical/abstract thought, then Feyerabend would be making the same mistake he criticised the 'Rationalists' for making when they denied reality to appearances: he would simply be inverting the argument and the same criticism of question-begging could be levelled at the inverted position. Consequently, the position Feyerabend ultimately defends is one in which "Nature herself can be approached in many ways ... and responds accordingly" (1987, 76.) and that "we either call quarks and Gods equally real, but tied to different circumstances, or we altogether cease talking about the 'reality' of things and we use more complex ordering schemes instead." (1987, 89, see also 1987, 125.) Feyerabend goes on to say that

This world is not a static entity populated by thinking ants who, crawling all over its crevices, gradually discover its features without affecting them in any way. It is a dynamic and multifaceted entity which affects and reflects the activity of its explorers. It was once a world full of gods; it then became a drab material world and it will, hopefully, change further into a more peaceful world where matter and life, thought and feelings, innovation and tradition collaborate for the benefit of all. (1987, 89.)

All this seems to be returning Feyerabend to radical idealism, but there is a subtle difference here: "Note that such an interpretation does not deny the effectiveness of science as a provider of technologies and basic myths; it only denies that scientific objects *and they alone* are 'real' ". (1987, 126.) That is, scientific objects are real in their own domain, but in different domains, other, non-scientific, theories and ideas, may be just as real. In order to stem the plausible, though false, assumption that Feyerabend is a radical subjective idealist, contending that our thoughts literally create and shape the world, I will now go off on what seems to be a tangent, but which is essential for understanding Feyerabend's position, and dispelling lingering doubts of madness.

3. FEYERABEND'S INTERPRETATION OF QUANTUM PHYSICS

After initially being critical of what has been called the Copenhagen Interpretation of quantum physics, Feyerabend came to believe that the Copenhagen Interpretation, or more specifically, Bohr's interpretation of quantum physics, was a physically, mathematically and philosophically coherent account of the micro-physical domain. (1968, 309–31, 1969, 82–105.) Though Feyerabend does not present complementarity as a central tenet of his philosophy, Bohr's position occurs again and again as an illustrative example of the points that Feyerabend argues for.² It is my contention that a full understanding of Feyerabend's conception of quantum physics is necessary in order to focus Feyerabend's philosophy. Quantum physics and

complementarity loom large in the background of much of Feyerabend's philosophy.

It has been said that Niels Bohr's principle of complementarity provides a universal epistemological lesson. Bohr himself states that complementarity should be seen as a contribution to the "general philosophical clarification of the presuppositions underlying human knowledge." (1937, 290; Folse, 1985, 12.) To fully understand the import of complementarity it is essential to juxtapose complementarity with the notions of reality, objectivity and knowledge, underlying the classical physical framework.

Within the classical framework the physical world is considered to have its attributes and existence independently of human observers. We come to know this world via observation and measurement, the results of which are directly predicable of the independent reality. Any effects which observation and measurement may produce are calculable and controllable, so that the theories thus arrived at are ideally a 'mirror' image of the world, where "every relevant element of reality and every relevant physical attribute of these elements has a corresponding counterpart in the theory" (Hooker, 1972, 70.). Moreover, not only does the theory contain counterparts of all relevant elements of reality, it also exhaustively characterises these elements for all attributes and for all temporal instants.

This last point is crucial for it is these two conceptions, completeness of description and spatio-temporal continuity, which quantum physics has called into question. The postulation of continuity is especially important in that it is a notion which holds together the entire classical framework and underpins the classical conception of objectivity: if a physical system always has determinate attributes, then, in an interaction of observation or measurement, it is always theoretically possible to distinguish between the observed object and the observing instrument. This is a necessary condition of classical objectivity: we must be able to distinguish between what the object is independently of observation, and what we contribute to the situation when observing an object. If this was not the case, then it is possible that physical systems have determinate attributes only when we interact with them, so that, in a sense, the physical systems would not be independent of human observations: we would 'create' the attributes by observing. This possible situation is avoided by postulating continuity of state: if all physical systems are in a well defined determinate state at all times, then we can say that the physical systems possess the attributes which we ascribe to them, whether we are interacting with the physical system or not.

Thus, classical objectivity relies upon two postulates: that there is an unambiguous distinction between subject and object, and that physical

systems possess all their attributes at all times. Bohr denies the validity and applicability of these two postulates. He does so because of his acceptance of the quantum of action in atomic processes, thereby denying the classical ideal of continuity of state: atomic processes are discontinuous processes. This discontinuity of atomic processes implies that an atomic system does not have determinate values of all of its attributes at all times. As we saw previously, the postulation of continuity of state was the reason we could separate subject from object in an interaction: objects are considered to be in a determinate state at all times and are therefore theoretically distinguishable. However, in an interaction of observation or measurement in the atomic domain, it is impossible, because of the quantum of action, to draw a sharp distinction between the object and the observing or measuring instrument. In Bohr's words,

The logical comprehension of hitherto unsuspected fundamental regularities governing atomic phenomena has demanded the recognition that no sharp separation can be made between an independent behaviour of the objects and their interaction with the measuring instruments which define the reference frame. (Bohr, 1958, 52.)

Consequently, the interaction must be considered as a whole, as an indivisible individual process.

For Bohr, and for Feyerabend, the ultimate source of all of the information we have concerning the nature of the world is phenomenal, sensory experience. This sensory experience, at least in the macro-world of everyday objects, gives us information whereby we can distinguish objects from each other and from ourselves. When we come to the investigation of the atomic domain our sensory information is of an experimental arrangement, which includes both observed object and observing instrument. Consequently, the object from which we derive empirical generalisations is the entire macro-experimental arrangement. This demand of Bohr's to consider the experimental arrangement as a whole produces the famous consequences of complementarity: the contention that 'wave' and 'particle' pictures and kinematic and dynamic properties of atomic systems are complementary aspects of reality. (Murdoch, 1987, ch's. 4 and 5.) This is because the "experimental arrangement required to realize one of the two alternatives rules out, renders undefinable, the classical concept appropriate to the description of the other alternative." (Hooker, 1972, 145.) Both are essential for a classically complete description of atomic phenomena, but they are not simultaneously applicable.

There are, in fact, two mutually exclusive classes of concepts which cannot be determined at the same time. If you are a classical realist, then this is an especially difficult concept to accept: surely, if atomic reality is particulate, then the particles must simultaneously possess, for example,

both position and momentum. The fact that quantum physics does not allow simultaneous determination of all physical attributes can only be an inadequacy of the theory, not a reflection of the objective situation. On this view quantum physics expresses our ignorance of physical factors and our inability to determine what is in fact determinate.

Bohr's reply is to say that the properties are not determinate at all, in fact, "we are here dealing with the mutually exclusive conditions for the unambiguous use of the very concepts of space and time on the one hand, and of dynamical conservation laws on the other," (Bohr, 1958, 72–3.) such that if, for example, we wish to precisely determine the position of a sub-atomic particle, then, in doing so, we are excluding the conditions necessary for the determination of the particles precise momentum: the concept of momentum is just not applicable to the situation. Feyerabend uses the example of the Moh's scale of hardness:

the concept of hardness as defined by the Moh's scale ceases to be applicable when the temperatures become too high and the same is true of surface tension at low temperatures. There is no need to continue this list which shows quite clearly the existence of nonprobabilistic concepts which characterize experimental setups, are applicable only in certain physical conditions, and change abruptly when the conditions change. Bohr assumes that position, momentum, etc. are concepts of exactly this kind and he specifies the conditions under which they are applicable, and to what degree of precision. (1969, 93–4.)

Feyerabend goes on say that "A block of ice may have a certain hardness on the Moh's scale; but when it melts ... its hardness simply ceases to exist." (1969, 95.) Similarly, once position is determined precisely, the physical situation and conditions preclude the determination of momentum, because it does not exist.

At this point it must be remembered that although much of Bohr's philosophy of complementarity is concerned with the conditions for the applicability of concepts and is, therefore, very much a conceptual issue, this does not mean that complementarity is derived from an a priori use of a philosophical theory, and that it has no physical underpinning. This could not be further from the truth: the whole structure of complementarity is based upon the physical discovery of the quantum of action, it is not therefore a purely conceptual theory. Rather, complementarity "is a discovery of the factual absence of the conditions required for the joint applicability of certain classical concepts." (Hooker, 1972, 137.) Not only that, but, as Feyerabend states, "the hypothesis of the relational character of all dynamical states is a physical hypothesis as it is an attempt to account for a long series of interesting conjectures and refutations." (1969, 93.) That is, many classical realist interpretations were proposed but their adequacy was refuted by experiment. We only need to look at the idea that atomic processes are said to exhibit characteristics of both waves and

particles. One thing cannot be both a wave, infinitely extended in space, and a discrete, discontinuous particle. (Hooker, 1974, 111–46.) Classical realist interpretations have never been able to satisfactorily account for these empirically supported assertions.

Thus, we must come to the conclusion that, taken as a comprehensive, absolute description of reality, the classical view of the world is false. The realistic ideals of classical physics are legitimately applicable of phenomena within a circumscribed range of conditions and parameters. Bohr contends that “all knowledge presents itself within a conceptual framework adapted to account for previous experience and that any such frame may prove too narrow to comprehend new experience.” (1958, 67.) Consequently, if we create circumstances never before known, then we will receive information from the world which we would not normally receive. This information will not fit previous categories because information pertains to the entire arrangement of circumstances obtaining. Thus the real lesson which Bohr taught revolves around the inherently contextual nature of all reality.³

4. FEYERABEND’S TWO TRADITIONS AND PROCESS REALISM

If we now step back from quantum physics and examine the implications of Feyerabend’s interpretation of quantum physics for his distinction between theoretical/abstract and empirical traditions, then we will find that Feyerabend’s ideas are entirely coherent and provide a very interesting and profound version of what may be termed ‘Process Realism’.

The fact that in our investigations of atomic phenomena we were inevitably drawn to the conclusion that the results of experiments are results pertaining to the entire experimental arrangement, rather than to some putative independent object, gives us reason enough to attempt to generalise these findings to other areas of investigation. Firstly, let us see what implications are inherent in sciences other than physics.

Imagine a biologist studying the transport and incidence of growth hormone in a particular species of bean. The particular bean species is selected from among a variety of alternatives, for a variety of reasons: speed of growth, availability, simplicity of structure, possible economic applicability. The bean seed of the species selected is then placed into a pot, one seed per pot. The soil in every pot is carefully selected and mixed so that each pot, within specified limits, have the same amount and constitution of soil. The pots are then placed into a regulated, weather and pest controlled environment, such that they are all exposed to the same range of specified temperatures and sunlight. Watering of the growing bean plants is done

in a carefully monitored way so that each plant receives the same amount of moisture. After a specified period of time the bean plants are removed and analysed as to the transport and incidence of growth hormone. This process is repeated many times to ensure repeatability, and to even out any anomalies that may have escaped the diligence of the biologist. In this particular situation the analysis of successive batches of bean plants is performed at different times in the life-cycle to produce a temporal picture of the incidence and transport of growth hormone.

I would conjecture that this situation has, in many respects, many parallels to the situation found in quantum physics. In conducting this experiment we cannot interpret the results obtained as presenting the true, real, essential nature of the incidence and transport of growth hormone in beans. The results obtained may be true and real, but they are true and real results of the entire experimental arrangement: the results are relative to the set of circumstances in which the experiment was conducted. Slightly different environmental circumstances will elicit different results, and these results will also be true and real, relative to the slightly different experimental arrangement. The list of possible experimental arrangements is, for all intents and purposes, limitless, and each result obtainable equally true and equally real: as long as the factors which are controlled, and those that are not, are known. We will never arrive at any comprehensive or absolute knowledge of the incidence and transport of growth hormone in the bean, or any other object of scientific investigation: every single bean plant in the world is exposed to a different causal, interactive environment. Consequently, the incidence and transport of growth hormone will be different in every single bean plant. We cannot have a completely controlled experiment which gives us unadulterated knowledge of the objects as they are in themselves: the environment, or experimental arrangement, is a necessary concomitant of any experiment and the knowledge derived is always a restricted knowledge which must be understood in relation to the entire experimental arrangement.⁴

These ideas are brought together by Feyerabend in a metaphysical vision wherein what is real is constituted by dynamic interactions between multiple elements, including human beings and their minds. Thus the particular circumstances, the particular experimental arrangements, constitute the 'particulars' which the proponents of an empirical tradition would work with; which an empirical tradition would accept at face value. On the other hand, the proponents of a theoretical/abstract tradition attempt to synthesise these particulars into an abstract scheme. In the case of our bean example, the results obtained, pertaining to the incidence and transport of growth hormone, in any one experimental set-up, constitute a real

and true ‘particular’ piece of knowledge. If we had an empirical attitude, then we would take this result at face value. Alternatively, if we had a theoretical/abstract attitude, then we would not be satisfied with such a result: we would look for further ‘particulars’ so as to build up a general formula for the incidence and transport of growth hormone in the bean, across all experimental arrangements. And if this could be achieved, then we would want to know whether the formula derived from the bean plants could be applied to other plants; or whether the formula for bean plants could be seen to be a sub-formula in a more general formula, and so on. To reiterate the point previously made, for Feyerabend, the results of the theoretical/abstract approach are not more real than the results upon which it builds; in fact, the theoretical/abstract results constitute just another ‘particular’.

If we look at Feyerabend’s metaphysics, we can characterise it as a process realism:

Scientists, being equipped with a complex organism and embedded in constantly changing physical and social surroundings, used ideas and actions ... to *manufacture*, first, metaphysical atoms, then, crude physical atoms, and, finally, complex systems of elementary particles out of a material that did not contain these elements but could be shaped into them. Scientists, according to this account, are sculptors of reality – but sculptors in a special sense. They not merely *act causally* upon the world ... they also *create semantic conditions* engendering strong inferences from known effects to novel projections and, conversely, from the projections to testable effects. (Feyerabend, 1989, 404.)

There is here no question as to the reality of elementary particles: given the experimental arrangement, as specified in sub-atomic experiments, and given the conceptual-semantic system of quantum physics, elementary particles can be justifiably posited. The world is manipulated so as to give specific responses. A better example is provided by the creation of superconductors: superconductors do not exist naturally, yet superconductors can be created under highly specific and difficult to realise conditions. Indeed, the modern scientific conception of the genesis and evolution of the universe can be seen to give support to Feyerabend’s ideas: various natural phenomena and natural, physical laws, only emerge once highly specific circumstances are realised, for example, stars, planets, life, consciousness, all form only under specific environmental boundary conditions.⁵ The questions Feyerabend asks are, what other phenomena and laws can we find under other differing circumstances and conditions? And, what is the limit to the range of possible unique circumstances and conditions?

For some philosophers the ideas above may be highly unpalatable, in that too much scope is given to the creative capacities of humans to create the world: the position is too idealistic. Thus Preston contends that “In his later papers ... Feyerabend developed ... [a] radical ... antirealist

position which bears negatively both on realism about scientific *theories* and on realism about scientific *entities*." (Preston, 1997, 424.) Moreover, for Preston, "Like any social constructionism about physical things, such a thesis sounds absurd. But Feyerabend did not shrink from its idealist implications. And this is what makes me think he really did relinquish the ontological core of scientific realism." (Preston, 1997, 427.) Feyerabend's response can be seen implicitly in the following passage:

I do not assert that any combined causal-semantic action will lead to a well-articulated and livable world. The material humans ... face must be approached in the right way. It *offers resistance*; some constructions ... find no point of attack in it and simply collapse. On the other hand, *this material is more pliable than is commonly assumed*. Molding it in one way ... we get elementary particles; proceeding in another, we get a nature that is alive and full of gods. (Feyerabend, 1989, 405.)

The important clauses which Preston does not take into his account are the ones which proclaim that reality "offers resistance" and that reality is simply "more pliable than is commonly assumed." If we look at the idea that reality "offers resistance" such that "some constructions find no point of attack in it and simply collapse," then we must conclude that Feyerabend's ideas are not completely idealistic: if reality offers resistance and unequivocally says 'no' to some constructions, then reality must, in some manner, be independent of the constructions.

If we take Feyerabend's second idea – that reality is more pliable than commonly assumed; that reality can exist in a number of incompatible manners – then Feyerabend is not committing himself to idealism. If we keep in mind the lessons Feyerabend appropriated from quantum physics – that any reality is a product of an interaction; related to the particular circumstances and conditions that obtain – then, as long as we say that any particular set of circumstances and conditions constitute a unique and exclusive reality, and that the number of possible sets of circumstances and conditions is numerable, we can see that, conceptually, there would be a disjunctive reality: reality as a whole is constituted by the disjunctive set of possible circumstances.

$$R_{\text{as a whole}} \{ C_i \Rightarrow R_i + C_{i+1} \Rightarrow R_{i+1} + \dots C_n \Rightarrow R_n \}$$

To reiterate, if we contend, on Feyerabend's behalf, that there is a one-to-one correspondence between sets of conditions and realities that result in those conditions; which implies that not all constructions validly describe the results obtained in particular circumstances and conditions, then Feyerabend cannot be charged with idealism; moreover, Feyerabend emerges as a, albeit idiosyncratic, but nonetheless unmistakable, realist.⁶

There may yet be grave reservations about the above quote, expressed by scientifically-minded moderns, concerning the contention that reality

may be explicable in terms of gods. Surely, the objection runs, science has progressed to such an extent, giving us reliable and unequivocal knowledge of the independent world in which we live, such that metaphysical suppositions like those of the Greek pantheon cannot now be supported or entertained by rational people: the malleability of the world has given way in the face of scientific success. Feyerabend responds to this with four rejoinders. Firstly, the fact that science is successful does not preclude the proposal of alternatives, that is, proliferation of theories is always possible and of utmost value. Secondly, the scientific world-view is not a homogenous, seamless, and systematically interrelated body of knowledge: scientific entities and domains are multitudinous and have not been exhaustively interconnected, or reduced to a set of fundamental physical laws. Thirdly, as I have shown, Feyerabend believes that the Bohrian approach to the fundamentals of quantum physics supports his conjectures: given the relinquishment of the subject/object dichotomy, and the realisation that scientific results are only predicable of the entire experimental arrangement, knowledge can be seen as fundamentally contextual and situational specific; therefore, given different conceptual-semantic schemes, and correlative specific investigatory frameworks, different systems of knowledge can find valid empirical support. Fourthly, Feyerabend argues that the specific success of science, and the means that have been designed to achieve that success, reflect the nature of the subject-matter chosen for investigation: the methods pertaining to controlled experiments certainly provide much valuable knowledge, however, the types of subject-matter that are amenable to such a treatment only constitute a limited, circumscribed, portion of reality. Feyerabend contends that the entities and processes postulated in other, non-scientific, metaphysical systems are not necessarily accessible or amenable to the procedures of experimental science; he further contends that this should not constitute a holistic, dismissive, criticism of these systems of thought. As Feyerabend states, "if Aphrodite exists, and if she has the properties and idiosyncrasies ascribed to her, then she certainly will not sit still for something as silly and demeaning as a test of reproducible effects." (Feyerabend, 1989, 398, and 400–3.)

What needs to be seen is that suppositions, such as that of the Homeric Greek gods, bring to the world their own conceptual-causal-semantic systems, which, by way of their unique 'experimental arrangements', often lead to empirical validation of an extensive character. If we accept the system, we then highlight those aspects of the world sympathetic to explication by our chosen system, and then engage in creating further conditions which will provide us with the best possible feedback.

Preston, however, has cast doubt on the effectiveness of Feyerabend's reasoning because of what Preston calls Feyerabend's 'voluntarism':

The later Feyerabend believes that the form *and* the content of our knowledge, *and thus the nature of 'being' itself*, depends upon our decisions. Instead of arguing *from* scientific facts *to* social policies, he explicitly recommends that we hold our social ideals constant and argue *backwards* (as it were) to the nature of the world. (Preston, 1997, 430–1)

Preston thus insinuates that, for Feyerabend, all that is needed to create new realities is to make a decision to have that reality; this would indeed be a pernicious doctrine. But this is not how Feyerabend approaches the matter: Feyerabend explicitly states that it is a matter of creating and arranging the right circumstances and conditions. The decision is the first step, but the second step is the decisive, most difficult and absolutely indispensable movement in the creation of realities. How much money, energy and coordinated teamwork is necessary to create the sub-atomic particles in particle accelerators? If such an endeavour was launched to investigate the possible existence of Homeric Gods, would empirical vindication be forthcoming? Even if we were to go to such lengths to vindicate the existence of the Homeric Gods, then, as Feyerabend explicitly states, the material may not respond to our approaches. The point to be made is that the created 'reality' is a conditional reality: conditional upon the coordinated social efforts of determined people, and upon the objective, independent constraints of reality.

Thus Feyerabend's contentions concerning the existence of Homeric Gods need not be taken literally: like his earlier defence of astrology and witchcraft it is partly rhetorical, partly provocative, and, at its strongest, a claim as to the possibility and as yet unfalsified status of schemes of reality incompatible with science; dismissed too swiftly by science. Homeric Gods are the provocative 'answers' to the questions posed previously: 'what other phenomena and laws can we find under other differing circumstances and conditions?' And, 'what is the limit to the range of possible unique circumstances and conditions?'

5. CONCLUSION

Preston has contended that 'voluntarism' is the "longest-standing theme in his [Feyerabend's] entire philosophy." (Preston, 1997, 430.) While this may be true, a far more important theme, of equal vintage, is the crucial notion of proliferation. Thus, while Preston sees a radical discontinuity in Feyerabend's philosophy between early and later versions, there is a plausible alternative: one can project a constant trajectory when we see

Feyerabend's philosophy in terms of proliferation. It can be seen that proliferation and pluralism are so deeply embedded in Feyerabend's intellectual thought, to the extent that false perceptions of the implications of proliferation even led Feyerabend to dispense with realism for a time!

Proliferation remains at the heart of Feyerabend's later explication of the theoretical/abstract versus empirical dichotomy of traditions: empirical traditions are pluralistic and profligate; while theoretical traditions are monistic and conservative. Consequently, in Feyerabend's later publications, alongside his presentations of the theoretical/abstract versus empirical/historical dichotomy, he continues to advocate proliferation of ideas, systems and ways of life, as proposed by J.S. Mill. (Feyerabend, 1987, 34.) Thus Feyerabend contends that proliferation can be evinced when we come to realise that "[the] complexity of real life (which is a life among particulars) ... keeps our minds flexible and prevents them from being overly impressed by similarities and appearances of lawfulness" (1987, 35.) That is, one of the ways to achieve proliferation is to draw back from abstractions and general statements, thus to see the multifariousness of the world anew. This is the situation which Feyerabend is trying to describe when he talks about empirical traditions: empirical traditions emphasise the particularity and multiplicity of the world. On the other hand, the controlled experiment is an excellent example of the tendency of thought associated with theoretical/abstract traditions. It is believed that in order to know what something really is, we must separate all extraneous factors: we must abstract the real from the multiplicity of particulars. Feyerabend has no in-principle objection to this approach. What Feyerabend emphasises is that the theoretical/abstract approach provides us with information concerning the behaviour of parts of reality not normally realised: an increase in the range of possible circumstances and the range of possibilities of knowledge, not a replacement of knowledge.⁷

These ideas of proliferation have no connection with radical subjective idealism. Rather, proliferation, interpreted metaphysically in Feyerabend's later philosophy, and with Bohr's interpretation of quantum physics providing the pervasive background, exhibits an astonishing echo and similarity to the tradition of process-philosophical thought: Feyerabend unknowingly recapitulates the basic philosophical thought of Whitehead and Dewey. Of course, in defending Feyerabend I am not contending that Preston and others are forcing their interpretation upon Feyerabend: there certainly are passages which are difficult to explain away, for example, in some passages Feyerabend seems to deny the possibility of illusion; such a position is ludicrous and seems to vindicate, considered in isolation, ascriptions of idealism. However, Feyerabend's texts are ambiguous and if we omit se-

lected passages the texts can be pushed in two different directions: towards the Preston-idealist interpretation, or towards my own process-realist interpretation. I believe that my own interpretation has the greater weight of textual and interpretative support, and, at the least, Preston, and any others who interpret the later Feyerabend in an idealistic manner, need to address the possibility of a process-realist interpretation, a task which Preston has not undertaken.

NOTES

¹ The distinctions given above seem to imply that theoretical/abstract traditions, in being opposed to historical traditions, are therefore ahistorical. However, Feyerabend contends that "abstract traditions are not alternatives of historical traditions; they are special parts of them ... The dichotomy between historical traditions and abstract traditions ... does not reflect a real difference: all traditions are historical traditions" (1981b, 8. See also 1987, 126–7.) That is, all traditions are inevitably historically bound and infused with the psychosocial, cultural and intellectual milieu of the time. It is important to note that this historical relativism is no absolute obstruction to the understanding of different cultures in time and space: Feyerabend himself has examined Galileo and Homeric Greeks and attempted to understand them as they were. This historical relativism only implies that the way in which we study other cultures and previous times must not be undertaken, uncritically, from the perspective of our own culture and time. This form of relativism is not a very radical one: it is not a relativism which cuts off communication and understanding, and it does not preclude realism.

² For example, in Feyerabend's relativistic/idealistic period he used Bohr's interpretation of quantum physics as an analogy to justify his relativistic/idealistic claims. (1978, 70.)

³ I am not here contending that this is the only interpretation, or even the best interpretation, of quantum physics. Rather, I am contending that Feyerabend adopted this interpretation and analogised it quite ubiquitously, and that if we understood Feyerabend's philosophy in terms of this interpretation of quantum physics, then we can begin to see how Feyerabend is not a subjective, voluntarist idealist.

⁴ Thus, Feyerabend would consider the billions of dollars spent on particle accelerators, with the justification that such expenditure is necessary because the fundamental constituents of matter are thereby discovered, as a fundamentally misguided venture. Granted, the results obtained may be true and real, but the results obtained are definitely *not* indicative of any fundamental reality: the results obtained are relative to the experimental arrangement, which, in this situation, are huge particle accelerators. Equally fundamental knowledge can be obtained by relatively cheap experimental apparatus.

⁵ Feyerabend's position has many similarities to the position of Hacking, 1983, 220–32, where Hacking quite plausibly argues that scientists create phenomena. For example, Hacking contends that "Hall's effect did not exist until, with great ingenuity, he had discovered how to isolate, purify it, create it in the laboratory." 226. Hacking does not then infer any idealistic conclusions from this situation: "On the contrary, the creation of phenomena more strongly favours a hard-headed scientific realism." 220. The created phenomena are no less real for being created: they simply show how matter acts in particular circumstances.

⁶ Interestingly, this thesis is testable, for example, some scientists contend that if the same conditions that obtained on Earth when life emerged could be reproduced elsewhere, then life would inevitably emerge. This is what a Feyerabendian metaphysical position would imply. However, other scientists have contended that the emergence of life was completely random: even if the same conditions prevailed life would not necessarily emerge.

⁷ With these ideas in mind, we can now see why there has often been obstinate resistance to the application of the methods of natural science, conceived of as abstraction and control, to the social and human sciences: the idea just doesn't make sense. We can agree with Feyerabend when he says that "in the human sciences it would not only be unwise but also immoral and tyrannical to 'annihilate' individual points of view because they do not fit into general frameworks of 'increasing explanatory power'"; 1987, 35. But we can also go much further in our criticism. It is of the nature of history, social analysis, or psychology, that the attempt to separate out certain factors, thereby supposedly coming to a more fundamental knowledge of the actors, movements and so forth thus separated, does not give us knowledge of the actual circumstances that obtain. History, for example, is the sum total of all the various movements and tendencies involved at a particular time, and it is the interactions between them which is of the essence of the situation. True knowledge in such a situation is, ideally, the sum total of influences and interactions: neglect any factors and the history is not complete. If, contrary to possibility, all variables could be 'controlled', in, for example, an analysis of a social movement, then we would not find the true nature of that social movement, rather, the social movement would vanish: its very nature is relational.

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