

Ideology in Paul Feyerabend's Philosophy of Science

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Introduction

The question of ideological¹ and political influence on science occasionally recurs in philosophy of science and scientific journalism, usually to attack pressure groups compromising the objective work of scientists or to describe the consequences of a given ideology—often religious—"winning" against scientific knowledge. However, to even enter a laboratory is to participate in ideological assumptions and material conditions—this point has also been discussed at length, usually by postmodern critics to "problematize" the sociological consequences of scientific findings. Between these poles a host of questions are raised which typically preoccupy philosophers of science, who have historically tried to give a prescriptive method for determining which scientific findings are "scientific" and which are not. Another perspective is that the approaches described above are simply not sufficient to describe the degree to which science in 20th and 21st century industrialized democracies is shaped by political, socioeconomic and ideological factors, and for this reason the late-20th century philosopher Paul Feyerabend and others² attempted to work out just what the relationship between ideology and science is, in practice.

His publications *Against Method, Science in a*

Free Society, Farewell to Reason, Conquest of Abundance and others have the consistent, overlapping thesis that science is too powerful to allow ideologies to control and that in order for truly free societies to flourish, ideology and science have to be uncoupled. An approach he offers to do this is an anarchist theory of knowledge—a standpoint which does not privilege one body of knowledge as more legitimate than others, so they can be tested against one another to find which maximize understanding of the world and which would only increase ignorance. Prioritizing the freedom of individuals and communities over "truth,"³ Feyerabend takes many measures to widen the gaps of certainty inside the domains of science and the ideologies which mold the world where science is conducted.

Using Feyerabend's texts as a compass, as well as discussing those critics and authors who support some of his claims in other areas, this essay will explore: i) ways in which the enterprise of science is ideologically defined by its very nature, ii) whether *it has ever historically been that case* that ideologies of some kind did not influence the work of scientists, and iii) whether the separation of ideology and science is *possible*. In approaching these questions, the merits of anarchist epistemology and other methods will be compared to examine science's role as a liberating social force in the way Feyerabend describes.

Background

Paul Feyerabend (1924-1994), an Austrian-born professor of philosophy who spent his prolific and controversial academic career in both European and American university faculties, authored many works discussing the philosophy of science and the sociological dimensions of science from the 1950s until his death, gaining popularity and notoriety in the 1970s. Because of the sometimes startling claims he makes in these works in order to provoke discussion he is still

¹ In this paper "ideology" refers to a set of beliefs or system of ideas informing a way of life—whether individual lives, that of a political party, or for societies at large—and that these beliefs shape the lives of people and their surroundings in conscious and unconscious ways.

² Among the late-20th century thinkers examining the sociological dimensions of scientific knowledge are those of the Edinburgh school—the "strong programme" provided by David Bloor and Donald Angus MacKenzie among others (and of which Feyerabend had a few criticisms)—which holds that all branches of human endeavor including the sciences emerged from and are therefore mediated by sociological factors. French sociologist Bruno Latour is another, who argues the examination of science in a sociological context has not yet transcended the "fact position"—that factors such as class, gender, psychology, and race can be invoked explain almost every aspect of human knowledge—or the "fairy position," which holds human efforts to understand the world are always inadequate projections onto the world (cf. Latour, 225-248).

³ "[It] is of course not true that we have to follow the truth. Human life is guided by many ideas. Truth is one of them. Freedom and mental independence are others. If Truth, as conceived by some ideologists, conflicts with freedom, then we have a choice. We may abandon freedom. But we may also abandon Truth." Feyerabend, "How To Defend," 4.

considered a fringe figure in the philosophy of science, certainly by mainstream science journalists:

Depending upon whom you read, Feyerabend is a 'cultural relativist,' 'epistemological anarchist,' 'the Salvador Dali of philosophy,' 'the wild man of twentieth-century philosophy of science,' and—for one particularly expressive commentator—the agent provocateur, the Shakespearean Fool, and the gifted charlatan all rolled into one.' The name 'Feyerabend' conjures up an image of a philosophical trickster, wickedly willing to praise voodoo and astrology and demean science and reason.⁴

Politically Feyerabend's works are interested in social equality and individual liberty while not subscribing to any leftist ideology such as socialism or liberalism, which are considered in his pages as useful "fairy tales" or reductive models of reality. As such his philosophical concerns developed through time to generally bear on the following—how to account for the success of scientific theories, the relationship of science and its application through technology to sociological change, the political dimensions of science, and the stature of scientific knowledge compared to other forms.

Because of his skepticism towards ideology, coupled with the fact that much of his work dispenses with mainstream and even radical models of scientific theory as insufficient caricatures, Feyerabend's stature as a reliable commentator on science has never been fully robust in academic circles.⁵ Nevertheless, "the call to take seriously the practical and political context of the scientific enterprise that earned Feyerabend his 'anarchistic' status is now honoured by a rich community of pluralist, feminist, political, and socially-engaged philosophies of science—even if only a few of them appreciate Feyerabend's status as a precursor of their interests and approaches."⁶ Certainly in terms of historical context, as a mid-to-late 20th century philosopher discussing the kinds of questions he does, Feyerabend's position in the schism between

⁴ Brown and Kidd, 2.

⁵ "The charge that Feyerabend's work involves a dangerous relativism and that it sanctions 'irrationalism' is widespread....Noting the 'playfulness' of much of Feyerabend's writings, some commentators even suggest that he is not a serious philosopher." Jary, 45.

⁶ Brown and Kidd, 2.

postmodernism and empiricism is of considerable interest.

Reactions against Immanuel Kant's theory of knowledge⁷ which fuelled G. W. F. Hegel's system of philosophy in the early 19th century and the late-19th century philosophies of G. E. Moore and Bertrand Russell created a split in the continuum of philosophical priorities—the tradition of Hegel, by way of Marxism and German idealism, culminating in the "continental" school, and the tradition of Moore, Russell and later Ludwig Wittgenstein becoming the "analytic."⁸ Generally speaking, the province of analytic philosophy includes formal logic, clarifying the nature of language, the terms of argument, and developing abstract, systematic descriptions of nature based on an empirical mode of knowledge. As a result the scope of analytic concerns fall squarely within the fields investigated by the natural sciences while the figures of continental philosophy, including Heidegger along with later social theorists like Adorno and Derrida, on the contrary reject the natural sciences' monopoly on knowledge in favor of more sociological and historicist methods.⁹ Though the fundamental content of these two traditions overlaps extensively, the methods of investigation in each is traditionally viewed as the source of their

⁷ Kant's theory of knowledge, integral to his philosophical system and explained in *Critique of Pure Reason*, can be summarized as follows—experience of the world is mediated by conceptual categories (heat, length, duration, etc.) inherent to the structure and activity of thought, and without these categories it would be impossible to relate to the world in a way recognizable to human beings. It is therefore not certain to what extent human experience of the world matches some reality outside of the mind or whether this outside reality can be said to exist. Hegel in *Phenomenology of Mind*, by contrast, claims that reality and the human mind include one another, reality and mind are an undivided whole, and this undivided whole (or "Absolute Mind") is everything that exists—therefore the human mind is always participating, knowingly or unknowingly, in unmediated relation with a reality that mirrors the structure of thought (a reality which cannot be said to be "outside" or "inside" the mind). Moore and Russell, in turn, reacted against Hegel in favor of common sense realism (the world more or less matches the way we perceive it through the senses).

⁸ These categorizations, whatever their inherent problems or ambiguity—and there are many—are nevertheless broadly useful for discussing the history of 20th century philosophy. (cf. Jones).

⁹ Cutrofello, 1.

differences.¹⁰ Science, which in the postwar period became a dominant institutionalized mode of inquiry has consequently become a primary point of contention between the two spheres.

Karl Popper, an Austrian-British philosopher whose thought drifted away from the certainties of the Marxist-continental school and was skeptical of the tenets of the analytic school, sought to describe the limits and potentials of scientific knowledge. His works *The Open Society and Its Enemies* and *The Logic of Scientific Discovery* offer discussions about science such as the distinction between "scientific" and "unscientific" theories as well as the complicated relationship between liberal democracy, philosophy, and science. Popper's main contribution to understanding the limits of scientific questions is *falsification*:

Every genuine test of a theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability: some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks....One can sum up all this by saying that the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.¹¹

With this formulation, Popper attempted to simplify the concerns of science so as to not overlap with other disciplines whose questions cannot be answered with empirical observation. "Tomorrow you will meet the love of your life," for example, is an unfalsifiable prediction in comparison to "Two positively charged ions will repel one another" because it operates under a set of assumptions which cannot be tested by observation and therefore lies outside the abilities or priorities of science.¹²

¹⁰ "The employment of the term 'continental philosophy' arguably evolved historically in order for there to be some single thing to which analytic philosophy as a whole could be opposed...analytic philosophers specified for themselves what continental philosophy was, in effect, by thinking of it as an enormous garbage bin into which any...non-analytic form of post-Kantian philosophy was to be dumped" (Conant, 17).

¹¹ Popper, *Conjectures*, 4. Note that falsification is intended to test the scientific quality of claims, not whether they are true or false.

¹² "[Popper's] aim is to develop a special point of view, to bring this point of view into logically acceptable form (which involves a considerable amount of rather pointless technicalities) and then to discuss everything in its terms....Not the ever-changing demands of

The scientific method until this time had remained more or less unchanged from Francis Bacon's description in 1620 in *Novum Organum*—"not to deduce effects from effects, nor experiments from experiments...but in our capacity of legitimate interpreters of nature, to deduce causes and axioms from effects and experiments; and new effects and experiments from those causes and axioms."¹³ This understanding, based on inductive reasoning, set the criteria for scientific investigation as data collection and hypothesis without needing to suit any particular epistemic model. Popper, in suggesting that the work of science needs to additionally meet falsifiable standards provided by philosophy,¹⁴ claims the concerns of science are in fact epistemic rather than simply a disinterested observation of nature—in summary, "there is no pure, disinterested, theory-free observation."¹⁵ Science can be understood in this way to always be practised within a larger ideological framework (such as that provided by Popper himself with falsification), and it is here that Popper identifies ideology as the conduit for science's influence on society and political influence on science.

Challenging the apparent simplicity of Bacon's method, Popper raised questions about the rationale of scientific discovery which led to a flood of works trying to finesse or refute his theories, among the most radical being those of Thomas Kuhn, Imre Lakatos and Feyerabend. Parallel to this surge in philosophy of science was the growth of postmodernism, a set of intellectual attitudes critical of dominant narratives within the sciences, the arts, and humanities. Thanks to the academic affiliations of some postmodern thinkers and the attention Feyerabend and Kuhn drew to scientific theory in the wake of Popper's publications,¹⁶ postmodernism from the 1960s

scientific research but the rigid requirements of an abstract rationalism decide about the form and the content of the principles accepted." Feyerabend, *The Problems*, 21.

¹³ Bacon, *Novum Organum*, §117.

¹⁴ A large part of the concerns of the philosophy of science, one might say its historical mission, is and has been to make these kinds of demands of the sciences.

¹⁵ Popper, *The Myth*, 8.

¹⁶ "With its influence in the academic world growing [in the mid-20th century], postmodernism was increasingly seen as the greatest metanarrative of all. A contributing factor was that scholars from the humanities increasingly encroached on other fields of knowledge, most controversially the natural sciences. After the theories of Paul Feyerabend and Thomas S. Kuhn had drawn attention to the social and cultural determination

onwards issued formidable disruptions to a cohesive theory of science as well as any supposed scientific objectivity.

Feyerabend's Philosophy of Science

It is within the historical context outlined above that Feyerabend surveys the interface of ideology and science. Feyerabend asserts that "science as a whole is founded on ideology. Particular scientific arguments may be free from it but the general framework of ideas in which the arguments are embedded...almost always has ideological ingredients."¹⁷ He adds that though this fact does not diminish the accomplishments of science, "[most scientists] simply accept the basic principles of their field and the evaluations that are built into them...without a single unbiased examination of comparative successes and failures [with other fields]."¹⁸ Feyerabend believes this leads to a kind of chauvinist tunnel-vision. Various disciplines hold, in his view, that not only do their methods hold a monopoly on truths about the world, they also deserve more federal funding—"a 'real world' constructed by special interest groups who use their own narrow values (and of course, their power) to confer unreality on any problem that might be perceived and even solved within a different approach."¹⁹ The ideological prism through which science is conducted, he concludes, colors the seemingly objective scientific "facts" and "laws" to a degree which cannot be ignored if they are to aid a democratic pursuit and distribution of knowledge.

Science being structured *in its very foundations* by ideology has a number of consequences, and knowing this Feyerabend developed an anarchist interpretation of knowledge within—or in reaction to—philosophies of science which he felt did not examine this particular issue closely enough.

He sketches out a system of critiques toward the idea that any method based on "firm, unchanging, and absolutely binding principles" can be shown to accurately reflect the historical conditions which have shaped the sciences. He further denies that such an idea will engender

of scientific practice, there were a number of studies focusing on the sociological aspects of science, on the nature of scientific texts...and the general relationship between science and society and culture." Böhnke, 36.

¹⁷ Feyerabend, "Science and Ideology," 154.

¹⁸ *Ibid.* 155.

¹⁹ *Ibid.*

progress within fields of research in the future.²⁰ *Anarchism*, in Feyerabend's use, 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."²¹ Additionally, his use of anarchism is not exactly an extension of political anarchy but emulates its rejection of totalizing theories in favor of a plurality—in order to be a force for good in the world, the sciences cannot be the specialized domain of an initiated few but, as much as possible, a self-policing democratic activity encouraging many perspectives.²²

Feyerabend argues further that science is an "anarchistic enterprise," its breakthroughs proceeding not by philosophically-prescribed rules or methods but through scientists experimenting and rejecting modes of thinking which would restrict their freedom to know. The only general principle applying to science in all historical periods, he estimates, has been that "anything goes"²³—the events and results that constitute the sciences have no common structure; there are no elements that occur in every scientific investigation.²⁴ He claims the version of science that "persists in large and well-financed institutions...that underlies science instruction at all levels, advanced seminars included"²⁵—that is, a picture of science or "the scientific method" as a uniform intellectual activity instead of a heterogeneous family of historically-and-culturally-bound practices—is a useful myth only for "metaphysicians, schoolmasters and politicians trying to make their nation competitive."²⁶ Acknowledging the sciences as existing within a political framework of this kind, Feyerabend examines the ways in which ideology shapes the knowledge produced by research.

²⁰ Feyerabend, *Against Method*, 14. For science to move forward believing in a uniform, trustworthy method it must be ignorant of its own historical process—cf. Alfred North Whitehead: "If science is not to degenerate into a medley of *ad hoc* hypothesis, it must...enter upon a thorough criticism of its own foundations" (18).

²¹ *Ibid.*

²² This particular aspect of Feyerabend's thought is not well-developed; exactly what this world would look like is left vague. It would not mis-characterize his views to say that Feyerabend would consider democratic control over the sciences' interaction with the state would be better and safer than corporate control.

²³ *Ibid.*

²⁴ Feyerabend, *Farewell*, 281.

²⁵ "Science and Ideology," 157.

²⁶ *Against Method*, 249.

Ideology and Science

Feyerabend identifies rationalism as a central belief determining the conduct of the sciences and their place in Western democracy, and as an ancient Greek "attempt to transcend, devalue, and push aside complex forms of thought and experience."²⁷ Rationalism is an attitude towards knowledge that privileges deduction, logic, and abstract reasoning in general as the primary mode of verifying what humans perceive through the senses, doubting as a result that the world as it is perceived is an entirely "truthful" representation. René Descartes' 1637 *Discourse on Method* is an attempt to deal with this apparent disconnect, becoming in the process a foundational work describing the method of rationalism:

...never to accept anything for true which I did not clearly know to be such...to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution...to conduct my thoughts in such order that, by commencing with objects the simplest and easiest to know, I might ascend by little and little, and, as it were, step by step, to the knowledge of the more complex ... in every case to make enumerations so complete, and reviews so general, that I might be assured that nothing was omitted. ...[T]here is nothing so far removed from us as to be beyond our reach, or so hidden that we cannot discover it, provided only we abstain from accepting the false for the true, and always preserve in our thoughts the order necessary for the deduction of one truth from another.²⁸

This reduction and compartmentalizing of experience into knowable parts is, as Feyerabend mentions, part of the Greco-Roman tradition's influence on modern Western societies—it distinguishes "between a 'real world' and a 'world of appearances'." [As ancient rationalists] presented the matter, the real world was simple, uniform, subjected to stable universal laws and the same for all.²⁹ He identifies rationalist reductions of nature as a characteristic of Western thought going as far back as pre-Socratics like Heraclitus and Parmenides.

Rationalism exercises an influence on the sciences and how they are understood that is hard to overstate. For example, in what way does a formula like H₂O—describing the atomic properties of water, ice and steam—correspond with nature? To say "water is H₂O" says nothing of wetness, temperature, how light interacts with it, its various uses or anything else, only what it is when reduced to its chemical constituents. That the formula "H₂O" corresponds to water, or that the word "water" corresponds to a clear, odorless, drinkable substance depends on a reductive identity of a natural phenomenon to a set of readily-knowable characteristics. It, in short, does not correspond to nature at all but presents a model by which nature can be known without direct observation. In still fewer words, it is true by definition. Thanks to reductive models like equations and theorems a scientist can in practice "know" an aspect of nature independent of experience, and when faced with the baroque abundance of the universe can identify water whether it is liquid, solid or a gas because the number of atoms is the same. When asked what the atoms look like, an answer could only be given in the form of more models.³⁰

In this sense rationalism is very useful to scientific theories and necessary for many. Without it concepts like the speed of light would be impossible—in order to achieve a high-level generalization like "light always travels at approximately 3.00 x 10⁸ m/s in a vacuum, we will denote this with *c*," the variety of possible experience and diversity of phenomena have to be made very abstract. Mathematics, the notation system by which phenomena are made reducible and abstractly knowable, operates under a set of assumptions inconceivable without the "real world-world of appearances" split—"it appears that necessary truths, such as we find in pure mathematics and particularly in arithmetic and geometry, must have principles whose proof

³⁰ "Modern elementary particle experiments have pushed this aspect to an extreme. Here we have entire cities, watched around the clock...their intestines protected from undesirable influences while their active parts produce events that cannot be seen, not even in principle, but are recorded and interpreted by complex and highly sophisticated instruments....Examples such as these show very clearly that modern science uses artifacts*, not Nature as She is....[We] infer that the final product, i.e., nature as described by our scientists, is also an artifact." Feyerabend, *The Conquest*, 238.

*By "artifact" Feyerabend is describing models as opposed to some direct, immediate apprehending of objective truth, that is, we are to understand "elementary particles" and "nature" in this passage as reductive models rather than "real" entities.

²⁷ *Farewell to Reason*, 65.

²⁸ Descartes, *Discourse on Method*, Ch. 2, Para. 7-11.

²⁹ Feyerabend, "Knowledge and the Role," 167.

doesn't depend on instances (or, therefore, on the testimony of the senses), even though without the senses it would never occur to us to think of them....Euclid understood this so well that he demonstrated by reason things that experience and sense-images make very evident."³¹ It is with these abstract methods that the rationalist probes the world of appearances—a set of clues—for underlying unity which can be represented in formulas and theories which will hold true in spite of time, space or circumstance.

Through abstraction, additionally, the idea of scientific "laws" and "facts" is possible. Feyerabend believes these ideas stretch the limits of the doable, noting "abstract theories or models compare projections (i.e., stereotypical perceptions stripped of many peculiar aspects) to projections (i.e., streamlined inferences of consequences from the theories or models). The match between them is an artificial construction, often made to fit using ad hoc interpretations."³² In other words, the extent to which a physical law can be said to correspond with nature—like "H₂O" corresponding to "water"—is at the level of representation, or of a model, not a clairvoyant uncovering of its unchanging essence.³³

The law of gravity, for example, is a *way of understanding* a diverse array of phenomena—falling bodies—without observing them individually or directly. There is no doubting that this is useful for the purposes of scientific understanding. Feyerabend does not deny that rationalist models of nature serve the work of scientists exceptionally well, he only acknowledges that a map is not the same as the territory it illustrates.³⁴

³¹ Leibniz, *New Essays*, I, 3.

³² Feyerabend, *Conquest*, 138.

³³ Cf. W.V.O. Quine: "The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges" (29). Quine holds that there can be no isolated test of a scientific hypothesis—empirical investigations are always occurring within some established theory of knowledge about the world or conditions one is observing. Further, the truth of any statement (i.e. "I am holding my hand in front of me") can be evaluated by itself, only as part of a larger set of statements (cf. Ludwig Wittgenstein, *On Certainty*). This position is known as confirmation holism, or the Duhem-Quine thesis.

³⁴ Alfred Korzybski also, famously, points out that "the map is not the territory" to demonstrate that such tools as language and mathematics, being representations

According to Feyerabend rationalism is also at the heart of political ideologies like liberalism, which regards the rationalist picture, coinciding "with science," as "not just one view among many, but as the basis of a society."³⁵ He uses the example of anthropology, which emphasizes "the psychological meaning, the social functions, the existential temper" of other cultures while considering "...oracles, rain dances, the treatment of mind and body [as expressing] the needs of the members of the society,...a social glue". Liberal anthropologists throughout history have acknowledged a people's need for these rituals without granting them "an accompanying knowledge of distant events, rain, mind, body."³⁶ Feyerabend believes this dissection of "non-scientific" cultures is harmful to the preservation and legitimizing of their traditions and worldviews, leading to an indirect or direct dismissal of their way of life as unadvanced. The teleological view that indigenous rituals are proto-science or magical thinking would make indigenous cultures a problem to be solved with modernization, absorbing them, in Feyerabend's estimation, into the tradition "of the White Man" curing them of superstition.³⁷

Empiricism is another ideology characterizing modern science, which Feyerabend considers parallel to rationalist, or "theoretical" traditions:

...rationalism did not introduce order where before there was chaos and ignorance; it introduced a special kind of order, established by special procedures, and different from the order and the procedures of historical traditions. The theoretical approach had results in fields such as astronomy and mathematics. In the Republic, 530ff, Plato advised the astronomers to construct abstract models and to 'disregard things in the heavens'. Those following the advice succeeded beyond expectations. But the success could not be foreseen and, besides, it did not immediately lead to better numerical values than, say, the Babylonian

removed from the world they describe, do not correspond 1:1 with the world human beings inhabit. Arthur Schopenhauer extends this when he writes that a person "does not know a sun and an earth, but only an eye that sees the sun, a hand that feels an earth" (*World As Will and Representation* 3). In the rationalist picture, there is no direct apprehension by humans of a world as it is.

³⁵ Feyerabend, *Science in a Free Society*, 76.

³⁶ *Ibid.* 77.

³⁷ *Ibid.* 76.

predictions which rested on different and more empirical principles.³⁸

Empiricism favors observation and understanding of particulars in the manner Francis Bacon described over purely abstract models, though it overlaps with rationalism and many foundational rationalist philosophers such as Descartes have outlined empirical scientific methods. Because observation and data gathering are key to this form of knowledge, empirical approaches to science are generally more accepting of the relationship between the senses—or instruments which extend the reach of the senses like microscopes—and the outside world, and that here is an "outside world" to observe. In this respect we might say a "pure" empiricism and a "pure" rationalism diverge from one another, but as Feyerabend mentions, "the discovery of irrational numbers; the semantic paradoxes; the difficulties of the theory of ideas; the sense-reason problem; the mind-body problem, and so on" have contributed in history to a partial return from pure rationalism to more empirically-grounded scientific models.

Even so, Feyerabend describes a fundamental problem of the empirical tradition lying in "the idea that experience might be a basis for our knowledge [being] at once removed by the remark that '[t]here must be discussion to show how experience is to be interpreted.'" ³⁹ Here he takes his frequent touchstone, John Stuart Mill's 1859 work *On Liberty* as a valid critique of empiricism. In it, Mill continues—"few facts are able to tell their own story, without comments to bring out their meaning....In the case of any person whose judgment is really deserving of confidence, how has it become so?" ⁴⁰ Mill is making a statement here that calls Popper to mind, that there is no observation or theory which is not lensed by some higher structure. From this the question may be asked "What makes an empirical observation deserving of confidence?"

Materialism may be called the higher structure grounding empiricism whereas idealism may be called the same for rationalism—in the former, stemming from Democritus, reality is purely physical and tangible, with things like "mind" and "emotion" being products of physical interactions. In the latter, stemming from Plato, reality is ultimately mental and abstract, with the physical universe becoming a low-definition product of the senses. Empirical observation would regard idealism as an unnecessary step, seeing "evidence"

for Plato's idealism, such as the idea of "perfect triangles" as reducible to the human brain's ability for pattern recognition, for example. This appears to be a common-sense enough attitude, and by reducing reality this way a number of favorable results can and have been achieved. However, to paraphrase Feyerabend, to justify any theory of knowledge by the *results* it produces "counts in its favour only if these results were achieved by [that theory] alone, and without any outside help" pointing out further that "ideological pressures... make us listen to [one theory] to the exclusion of everything else."⁴¹ These ideological pressures are social, political and economic in nature and are part of determining prevailing theories "to the extent to which any political...group is permitted to influence society."⁴² Therefore the "truth" of a theory of knowledge—materialist, idealist or otherwise—depends on the dominant ideology of a society.⁴³

When this is acknowledged, Feyerabend considers the society at an epistemological crossroads—either embracing the dominant ideology (which can include a spread through colonization), embracing relativism, where "traditions not only have no well-defined boundaries...[enabling] their members to think and act as if no boundaries existed: potentially every tradition is all traditions,"⁴⁴ or embracing cultural pluralism. In all cases, "decisions concerning the value and use of science are not scientific decisions; they are decisions to live, think, feel, and behave in a certain way."⁴⁵ The sciences then become ideologically defined from the outside, and it is here where the danger lies spurring Feyerabend to call for "a formal separation between state and science."⁴⁶

He illustrates this point in part by discussing the situations within which the sciences are

⁴¹ "How to Defend," 8-9.

⁴² *Ibid.* 9.

⁴³ Consider the Soviet republics making the "dialectical materialist" view of the world and history into an official policy to the exclusion of religious institutions and alternatives to socialist economic theories. cf. Bernard Wills, describing the Enlightenment conception: "[for] modern science (leaving aside the question of post-modern science) being is assumed...to be inert passivity described through the model of a machine whose parts are externally related." This concept of nature is opposed to *mythos*, the religious model of being as participating fundamentally within a cosmic narrative rather than as the blind flowing of matter (58).

⁴⁴ *Conquest of Abundance*, 143.

⁴⁵ *Farewell to Reason*, 30.

⁴⁶ "How to Defend," 9.

³⁸ Feyerabend, *The Problems of Empiricism*, 9.

³⁹ *Ibid.* 67.

⁴⁰ Mill, 23.

expected to work in some industrialized democracies—"Government scientists redefine their problems when a new administration comes along...scientists working on defence contracts adapt their approach to the changing political and defence climate, ecologists follow public needs, computer technologists [switch] their priorities with every flicker of the market."⁴⁷ In a way this is obvious, and a common complaint from parties wanting to defend the work of scientists from policies viewed as oppressive or anti-intellectual. In the 21st century particularly there has been a vehement championing of science as a safe harbour for reason in an unstable global community overrun by religious fanatics and plutocratic businesspeople threatening science's methods.⁴⁸ In a 2006 editorial for *Nature* titled "Science Under Attack," discussing the Bush administration's policies regarding science as exerting "tighter control of the branches of government where scientists work," the editorial staff claims that for "science to flourish it needs settings that support freedom of enquiry, and the creation of such settings was a great achievement of the Enlightenment. Protecting them is vital, not just for science but for all of humanity."⁴⁹

American conservative institutions are often a target for these criticisms. In a 1999 interview, Noam Chomsky replied to the Kansas public school policy against teaching natural selection as "another long step in the project of redesigning the school curriculum in ways that will reduce the possibility of students having the intellectual tools to escape the fundamentalist fanaticism that the designers of the new curriculum prefer."⁵⁰ Chomsky views criticism of science from leftist circles, more diffuse throughout Western university faculties, as also fallacy-ridden even if its political influence is less powerfully felt:

[Science] is dominated by "the white male gender." It is "limited by cultural, racial and gender biases," and "establishes and perpetuates social organization [with] hidden political, social and economic purposes." "The majority in the South has

⁴⁷ *Farewell to Reason*, 41.

⁴⁸ The bibliographies of "New Atheist" authors Christopher Hitchens, Sam Harris and Richard Dawkins attest to this, raising the post-9/11 political climate to a Ragnarök between the forces of science and the forces of religion radical or not, along with internet-popular science educators Neil Degrasse Tyson and Bill Nye, whose many debates with hapless apologists for religion and creationism are an instructive spectacle.

⁴⁹ "Science Under Attack," 891.

⁵⁰ Chomsky, *On Democracy and Education*, 98.

waited for the last four hundred years for compassionate humane uses of [science]," which is "outside and above the democratic process."...Conclusion: there is "something inherently wrong" with [science]. We must reject or transcend it.... Furthermore, [science] "claims to a monopoly of knowledge." It thus denies, say, that I know how to tie my shoes ...⁵¹

Chomsky views these criticisms, along with postmodern and poststructuralist criticisms, as making a few potentially true criticisms nested in many mistaken assumptions about the "*science*" they target, while dismissing "dedicated, serious and often successful efforts to overcome traditional exclusiveness and privilege" in university science and engineering faculties.⁵² He concludes that these criticisms provide no equally substantial alternative to the sciences as they are currently practiced, and that the political ideologies mediating science's image within public and educational institutions undeniably take many forms across the spectrum.

Faced with a diversity of competing political perspectives, relativism is often given as a solution. Feyerabend sees "relativism," similarly to "science," as an array of attitudes rather than a uniform node. He describes relativism as a threat to modern intellectuals—"just as the enlightenment once threatened the existence of theologians and priests"⁵³—as practically synonymous with "democratic judgement."⁵⁴ Relativism presents its own difficulties but categorically rejecting it presents "others, since competing theories do not necessarily have to duel one another for the upper hand—according to ancient skeptics like Sextus Empiricus, for example, "if opposing views can be shown to be equally strong...then there is no need to worry about them."⁵⁵ It is through a dogmatic projection of false dilemmas onto conflicts (ie. only one perspective in a debate can be correct) that there arises the need for "objective truth," an aim assumed throughout the sciences by reasons explained above to be possible and necessary.⁵⁶

⁵¹ Chomsky, "Rationality/Science."

⁵² *Ibid.* Employment statistics in the science and engineering fields may say otherwise.

⁵³ Feyerabend, *Science in a Free Society*, 79-80.

⁵⁴ *Ibid.* 86.

⁵⁵ Feyerabend, *Farewell to Reason*, 76.

⁵⁶ The assumption, if an implicit one, of an objective outside world is a practical necessity for engineering—calculations needed to land a rocket on the Moon would not need to be so exact if the rocket and the Moon were social constructs or phantoms of the mind (see the footnote on Quine above).

Feyerabend describes critics of relativism—including Popper, who asserts it is a "theory that the choice between two competing theories is arbitrary"⁵⁷—as ignoring natural diversity, where each "division, phylum, species developed its own way of being in a world" as well as "the disasters created by attempts to enforce a uniform way of life" when cultures come into contact.⁵⁸ For Feyerabend, questions about objective truth are not only a matter of ivory-tower philosophizing but have fatal consequences when groups enforce this claim to objective truth, a "right way," with violence and oppressive socioeconomic structures—it is "not about concepts...but about human relations."⁵⁹

Imperialist Science

It is through colonialism and imperialism that the ideologies and cultural attitudes structuring the sciences have had fatal legacies elsewhere on humanity. Certainly post-colonial indigenous critics attest to this—Temagami critic Dale Turner, examining the 21st century situation for indigenous Canadian citizens, writes "the very ways we frame the language of rights, sovereignty and nationalism" in regards to indigenous peoples are "steeped in colonialism....[Any] special political lights aboriginal communities may possess can be subsumed within already existing Eurocentric political theories of justice."⁶⁰ "White Paper liberalism was offered as a way for Aboriginal peoples to participate more equitably in day-to-day Canadian society, but it is not the kind of participation Aboriginal peoples are demanding."⁶¹ After the violent generations of colonizing indigenous lands and subjecting the surviving peoples to dehumanizing conditions,⁶² the legal and political structures an aboriginal person is

expected to live inside today—structures finding their source in Euro-American philosophies—still alienate and diminish their self-determination in predominantly white society. Imperialism, described by Maori critic Linda Tuhiwai Smith as "a complex ideology...[located] within the Enlightenment which signalled the transformation of economic, political and cultural life in Europe," is an integral part of "the development of the modern state, of science, of ideas and of the 'modern' human person."⁶³ As such, imperialism exerts its influence in the 21st century through concepts like "the individual," which make modern democracy possible, permeating the social imagination to an extent that alternatives—such as those found in indigenous conceptions of personhood—are hard justify on imperialism's own terms.⁶⁴

Under this perspective, the imperialist ingredient to the Western Enlightenment tradition has made knowledge something "there to be discovered, extracted, appropriated and distributed"⁶⁵ like a raw material resource, like South American gold carried by a Spanish galleon awaiting refinement by more exacting theories of knowledge. Conquered peoples have historically been the targets of this predatory thirst. An example of this is the "rescuing" of artifacts by Western researchers and wealthy hobbyists from "decay and destruction, and from indigenous peoples themselves, [legitimated] practices which also included commercial trade and plain and simple theft."⁶⁶ More than this, "the development of scientific thought, the exploration and 'discovery' by Europeans of new worlds...the globalization of knowledge and Western culture reaffirms the West's view of itself as the centre of

⁵⁷ *Farewell to Reason*, 80.

⁵⁸ *Ibid.* 77.

⁵⁹ *Ibid.* 83.

⁶⁰ Turner, 95-96.

⁶¹ *Ibid.* 97. The "White Paper" in question is a 1969 proposal under the Trudeau government to abolish the oppressive Indian Act, in the process eliminating "Indian status" from aboriginal peoples leaving them legally vulnerable in the midst of racist political structures. Many aboriginal citizens felt at the time it was "yet another manifestation of European colonialism...unilaterally legislating aboriginal peoples into extinction" (Turner, 12).

⁶² The land rights controversies surrounding the Muskrat Falls and Mactaquac dam building projects in Atlantic Canada are just two out of many examples of corporate and government interests serving to continue the colonial agenda under a modern guise.

⁶³ Tuhiwai Smith, 23.

⁶⁴ "The individual, as the basic unit from which other social organizations and...relations form, is another system of ideas which needs to be understood as part of the West's* cultural archive...[the] individual can be distanced, or separated, from the physical environment, the community....Both imperial and colonial rule were systems of rule which stretched from the centre outwards to places which were far and distant. Distance again separated the individuals in power from the subjects they governed." (Tuhiwai Smith, 50, 58).

*in this context meaning 'as opposed to indigenous or non-European.' Marshall McLuhan, working as much within the Eurocentric tradition as he could be said to be working outside or around it, notes in *The Gutenberg Galaxy* that the individual is the historical product of reproducible printed texts—a transmitter of knowledge privileged over more "tribal" oral transmission.

⁶⁵ Tuhiwai Smith, 61.

⁶⁶ *Ibid.* 64.

legitimate knowledge:⁶⁷

In the nineteenth century the scientific drive assumed that there were universal models of human society and human nature, and that societies deemed to be more primitive could contribute to science by showing the most simple, most fundamental systems of social organization...While Western theories and academics were describing, defining and explaining cultural demise, indigenous peoples were having their land and resources systematically stripped by the state; were becoming ever more marginalized; and were subjected to the layers of colonialism imposed through economic and social policies.⁶⁸

It is not through some careful comparison and contrast with indigenous knowledge that Western science, in such manifestations as medicine, has been shown to reflect reality more closely, but through simple force and economic subjugation. Along with murdering swathes of the population, cutting off younger generations of indigenous persons from their community's ideology through missionary re-education—learning the "master language" as Feyerabend calls it⁶⁹—and conversion to the colonial religion, the colonists reinforce *their* ideology, which includes their sciences, as the norm.

As with the White Paper example above, proponents of liberalism and neoliberalism, with their individualist and rationalist foundations, have historically seen few theoretical problems in absorbing an individual from one community (an aboriginal group) into a new one (a capitalist democracy) without drastic damage being done,⁷⁰

⁶⁷ Ibid. 66.

⁶⁸ Ibid. 90.

⁶⁹ Feyerabend, *Farewell*, 81.

⁷⁰ The Liberal government under Louis St. Laurent's repeal of the Indian Act in 1951 left childcare of aboriginal communities in the hands of provincial governments, leading to the "Sixties Scoop," a widespread adoption of aboriginal children by white families throughout Canada ending in the 1980s. Instrumental to ending this was Judge Edwin Kimelman's appointing of a committee whose 1984 report determined these adoptions of aboriginal children by out-of-province white citizens was systematic cultural genocide. cf. Arthur Milner, "The Sixties Scoop thirty years later," *Inroads* 10 (2001), 164; Manitoba Community Services, "*No Quiet Place*, Final Report of the Review Committee on Indian and Métis Adoptions and Placements to the Minister of Community Services," Winnipeg (1995).

even if they have not done the actual colonizing themselves.⁷¹ Existing within these modern political structures, indigenous peoples are still trying to decolonize and restore their bodies of knowledge, not only for cultural identity but for political autonomy and the health of its populations—returning to the example of Canada, "[contemporary] relations between Aboriginal peoples and the Canadian state are founded on a racialized ideology, which continues to support the tenets of colonialism....The health-related, systems-level determinants resulting from [the Indian Act] are far-reaching and influence almost every aspect of First Nations peoples' lives...systematic discrimination from resources and opportunities may well be interpreted as a form of structural violence."⁷² For an indigenous community to actually function in a post-colonial society, the autonomy to determine their own "housing... programs and services... infrastructure...and health systems"⁷³ by and for themselves like any other community is necessary. This includes, where it is needed, restoring indigenous healing traditions which have been "explored, researched, refined, and perfected" by indigenous peoples for "millennia."⁷⁴

Colonization of the sort characterizing the Age of Discovery is a glaring example of imperialism and a stark illustration of the callous extremes ideology can reach. In the late-20th to 21st centuries colonial oppression is not only still felt by those who live in former European colonies but entirely modern forms of colonization are spread through globalist *laissez-faire* economic practices by dominant industrial centers such as the United States and parts of Europe. These are aided—and one might argue it is no coincidence—by heavily interventionist foreign policies by these countries with a view to installing capitalist

⁷¹ Of course there has been progress since the 1960s considering aboriginal rights, though at this stage it is hard to say how far it has come. This attitude towards the amorphous individual also extends to interventionist foreign policies which operate, if not consciously then certainly in practice, under the assumption that the end flourishing of every state is a capitalist liberal democracy and anything other is somewhere between a formidable, threatening alternative (the Soviet Union in the Cold War) and a barbaric junta oppressing its people (hostile Middle Eastern states, military dictatorships throughout Africa)—that the transition for the people in these states to a new way of life will be natural.

⁷² Reading, 9.

⁷³ Ibid. 9-10.

⁷⁴ Steinhauer and Lamouche; Ibid. 152.

governments in unstable sovereign states.⁷⁵ Domestically, corporate and government interests are constantly at variance with indigenous self-determination as with examples like the Lower Churchill Project in Muskrat Falls, Labrador and the Dakota Access Pipeline.

Francis Fukuyama, assessing neoliberalism as exemplified by the United States in his 1992 work *The End of History and the Last Man* as the culmination of human history and the final stage of political development—the way which "works" being capitalist democracy, borne out by the end of the Cold War—assumes along with many neoliberals and neoconservatives that Enlightenment or Constitutional ideals thrive through the free market. This assumption influences a teleology lying behind notions of "developed nations" and "technological advancement" which the sciences are used to facilitate. The imperialism still permeating global relations remains paternal, that formerly or currently oppressed peoples can be made whole from the outside rather than allowing them some independence to develop along their own paths, letting their equality be more than "equality...to access one particular tradition" i.e. industrialized democracies and Western capital.⁷⁶

Finally, political ideology shapes the sciences materially—space telescopes, nuclear fission reactors, gene sequencing laboratories and so on cost money, and more than most individual scientists doing the research are able to spend. A technology such as the internet⁷⁷ would not have been possible under its originating historical conditions without military-funded laboratories in large-scale facilities like MIT and Santa Monica University, and even the federally-funded Apollo programs would not have been possible without corporate manufacturing contractors like Boeing. Even in comparatively rare cases like the SpaceX program which are funded by private persons, to some extent or another the interests of the financier—somewhat like a Renaissance art patron—will influence the kinds of research conducted and the lengths to which that research

can reach.⁷⁸ This is not to mention the legal dimension built into the state-science network, since even a very wealthy person will run into considerable difficulty acquiring the necessary equipment to replicate the Saturn V rocket due to the classified technical data used by aerospace engineering firms.

Whole bodies of knowledge can more or less live or die by a bottom line mentality depending on expenses needed to explore them being justified,⁷⁹ and in the case of the environment this has and will continue to have catastrophic results—a paleontologist whose expertise can be used to find exploitable oil deposits will be deemed a much more valuable scientist, and one more deserving of research grants, than a paleontologist whose interest is in displaying Devonian placoderm fossils for public education. In too many cases, when lucrative funding is involved, scientists are simply employees working out the logistical wrinkles of expensive engineering feats rather than *primarily* exploring, the faithful interpreters of nature envisioned by Bacon. These noble pursuits are often peripheral to the work at the hand.⁸⁰ At least to the extent that science is always done in a set of socioeconomic conditions determined through political relations and allocated funds in similarly unpredictable circumstances, ideologies of some kind have always been entwined with the enterprise of science and this coiling together suffuses its theoretical foundations almost completely, as has been shown.

Separating Ideology and Science

It is in light of this that Feyerabend denies the ability of philosophies of science to prescribe or describe any "scientific method" which

⁷⁵ The Reagan administration's covert sponsorship of the anti-communist Nicaraguan Contras in the late 1980s, and the Nixon administration's disruption of the Vietnamese Paris peace accords before extending war in the area for the next five years, are just two examples.

⁷⁶ Feyerabend, *Science in a Free Society*, 76.

⁷⁷ The logic frameworks the internet uses were developed before the actual hardware designed through ARPANET was available, this hardware is what is being referred to.

⁷⁸ This is not to say the motives behind wealthy entities funding science are always somehow sinister or merely materialist—only to state the mundane case that unless they are charitable, the patrons of a laboratory, like movie producers, are making an investment they would likely like to see returned in the future.

⁷⁹ Another mundane fact to include for the sake of completeness is that of course many bodies of research which serve no political purpose have very sufficient funding behind them, we are only concerned with potentially hazardous ones since no social or environmental danger would be posed by a non-invasive study of freshwater grasses.

⁸⁰ "[The] uneven distribution of funds, national rivalries, fear of accusations (of malpractice, plagiarism, waste of funds, etc.) put restrictions on what some dreamers, many philosophers among them, still regard as a 'free intellectual adventure'" (Feyerabend, *Against Method*, 247).

definitively divides the "scientific" from "pseudoscience," or provide any account of scientific progress which justifies internal consistency between one groundbreaking discovery and another—that Thales, Galileo and Jane Goodall have some *essential* continuity binding them rather than using ingenuity within a given network of historically-contingent assumptions shaped by the socioeconomic conditions of their respective day. In his perspective science is not a gradual demystifying of truths that have always existed—clouded by historical and cultural conditions and one day, with the right methods, finally uncovered and fully known—but simply a family of tools for understanding particular problems within particular contexts. He contends if any continuity binds "science" as a static ahistorical idea, it is not that of a "scientific method"—or falsifiability or even, as Thomas Kuhn describes, revolutionary shifts in science's conceptual bases⁸¹—but of individuals thinking laterally through problems using whatever means are available.⁸² That science has achieved certain results does not show that it is a particularly authoritative method of knowing the world—and scientists are aware they are most often producing tentative, falsifiable models rather than static "facts"—only that it has been the most expedient solution to a certain domain of questions posed under certain restraints:

⁸¹ Feyerabend explains his position towards Kuhn's philosophy of science, as contained in *The Structure of Scientific Revolutions*, in the following way: "Kuhn says that 'the difficulties that have seemed to undermine the authority of science should not be simply seen as observed facts about its practice. Rather they are necessary characteristics of any developmental or evolutionary process.' But how do we know that science is an evolutionary process rather than a static way of finding more facts and better laws? Either from 'observed facts about its practice' or from interpretations that are imposed from the outside. In the first case we are back at the situation Kuhn wants to overcome while the second case means that science is being incorporated into a wider (cultural) context—a context that values developments—and is interpreted accordingly (the procedure I mentioned in parentheses above). It seems that is what Kuhn really wants, i.e. he wants to settle the question philosophically, not by appealing to facts. I would agree if I knew that for him this is one way among many and not the only possible procedure" (*Against Method*, 271).

⁸² "The consistency condition which demands that new hypotheses agree with accepted theories is unreasonable because it preserves the older theory, and not the better theory....There is no idea, however ancient or absurd, that is not capable of improving our knowledge" (*Against Method*, 5).

the "word 'science' may be a single word—but there is no single entity that corresponds to that word."⁸³

Feyerabend, aware of science's embeddedness within ideology and historical conditions, is nevertheless convinced that ideology and science, insofar as ideology determines the kinds of science being conducted through state mechanisms and economic regimes, can be disentangled—both for the good of societies, where "organs of the state should never hesitate to reject the judgement of scientists when they have reason for doing so," and for that of the sciences, "for a science that is run by free agents looks much more attractive than the science of today which is run by slaves, slaves of institutions and slaves of 'reason.'"⁸⁴ However this is not a license to let the sciences run free of accountability to society—the

objection that science is self-correcting and thus needs no outside interference overlooks, first, that every enterprise is self-correcting (look at what happened to the Catholic Church after Vatican II) and, secondly, that in a democracy the self-correction of the whole which tries to achieve more humane ways of living overrules the self-correction of the parts which has a more narrow aim.⁸⁵

An uncoupling of a state-science complex would engender individuals to "accept, live in accordance with, and spread ideas *as [individuals]*" instead of making one set of beliefs intrinsically predominant to being a citizen of that state.⁸⁶

John Stuart Mill provides the basis for Feyerabend to assert this—*On Liberty*, which Feyerabend cites often throughout his works, is based around the thesis of

a society of human beings fully and variously developed, morally vigorous, self-determining.... [Mill] views

⁸³ Ibid. 238.

⁸⁴ "How to Defend," 9, 12.

⁸⁵ Ibid. 251.

⁸⁶ We might imagine that in Feyerabend's vision that citizens would have greater control over the *use* of science and industrial engineering within their borders—it is evident from constant protests against fracking and pipelines, for example, that citizens do feel this is necessary already. Feyerabend could not foresee the kinds of problems facing the social dimension of science today; however, in zero-sum situations, such as vaccinations, it is best to accept the authority of pharmacists. The same goes for many such situations. Feyerabend would only recommend that the acceptance of this authority not be blind.

democracy with some ambivalence. He is committed to equality of moral status, to the responsibility of each individual ... [however] he cherishes 'civil' liberty; he wishes, that is to say, to limit the authority government over individual self-determination.⁸⁷

Mill states that the power by governments to exert coercion is "illegitimate. The best government has no more title to it than the worst" to legislate norms by which individual beliefs must conform.⁸⁸ In Mill's estimation, the official state ideology has no legitimate bearing on the beliefs of ordinary citizens—or it at least has a heavy burden of proof to meet if such bearing will be legitimate—and in this respect Feyerabend is fully in line with Millian democratic liberty: if democracy as formulated by current state structures cannot secure individual liberty, so much the worse for democracy.⁸⁹

Feyerabend further asserts "it would not only be foolish but *downright irresponsible* to accept the judgement of scientists and physicians without further examination," and that the lay population "can and must supervise" the sciences.⁹⁰ It is in this supervision—not by experts within the field or through corporate interests, but of ordinary citizens—that the sciences would be most fully consistent with the freedom of peoples in Feyerabend's view, since "science is not beyond the natural shrewdness of the human race. I suggest that this shrewdness be applied to all important social matters which are now in the hands of experts."⁹¹ The preservation of ways of life—not only democratic ones—is to Feyerabend far more crucial than preservation of the insights of particular systems of knowledge or the continuation of certain industrial practices, and this oversight has been the cause of much fatal imperialism and many suicidal ecological attitudes throughout human history.

For "maximum liberty of thought in the society in which we live now, maximum liberty not only of an abstract kind, but expressed in appropriate institutions and methods of teaching,"⁹² the dogmatism of epistemology and philosophies of science have to be subdued, and by receiving "anarchism" into the discussion as a possible "medicine" for doing so when the need

arises—allowing it to coexist with other perspectives—"ideologies must be seen in perspective...[since they can be] deadly when followed to the letter."⁹³ Though he does not address to any great detail the practical problems of getting such a program off the ground, a plurality of perspectives, lifestyles and ideologies living parallel to one another is in Feyerabend's estimation a surer safeguard against the kinds of transgressions which can characterize human relations especially in the midst of competing ideologies.

The preceding pages have hopefully given an accurate account of Feyerabend's thought on points relevant to the ideological, imperial and economic dimensions of Western science. A number of objections have been made to Feyerabend's overall approach, as well as the interpretations which inform his conclusions. It may be the case that he has many more detractors than sympathetic readers. His "irrationalist" reversals of conventional understanding of science articulated through sensational, provocative language is a constant point of dispute among science journalists, for instance, his understanding of John Stuart Mill—a pillar propping up his attacks on method—has been taken to task at least once as "synchronic and unhistorical, insufficiently sensitive to nuance and context."⁹⁴ A 1987 *Nature* article famously categorizes Feyerabend as "the worst enemy of science" of the time, viewing him as a trivial relativist who "can fool a lot of people a lot of the time with sophistries like 'anything goes'" but offers no substantial insight to the problems of method.⁹⁵

Other than being in the opinion of these critics basically ignorant of the reality of scientific conduct, the substance of Feyerabend's arguments has attracted widespread criticism though he considers them attacks on occasions in his writing where he stops "reasoning and engages in a little rhetoric."⁹⁶ One is his use of "anarchism" in regard to epistemology, which as Rom Harré writes, serves

as a parallel between political and epistemic anarchy so that the abandonment of any and all principles of method, including adherence to any basis of rationality is treated not only as being like political anarchism, but as an integral part of an anarchistic standpoint in which

⁸⁷ Skorupski, 338.

⁸⁸ John Stuart Mill, "On Liberty," *John Stuart Mill*, 23.

⁸⁹ cf. Paul Feyerabend, *Science in a Free Society*, 135.

⁹⁰ *Ibid.* 96.

⁹¹ *Ibid.* 98.

⁹² "How to Defend," 13.

⁹³ *Ibid.* 2.

⁹⁴ Jacobs, 212.

⁹⁵ Theocharis and Psimpolous, 596.

⁹⁶ Feyerabend, *Science in a Free Society* 125.

all order is abandoned.⁹⁷

The same critic contends

Feyerabend's philosophy of science turns on two points: (i) that the very world is changed in the radical transitions from one set of concepts to another, and that the change is brought about by non-rational means, by which he means by means irreducible to any combination of moves in logic;⁹⁸ (ii) that the whole of human culture ought to be taken to be available as a resource for the advancement of science, in particular remote cultures considered primitive or even bizarre ought not to be neglected.⁹⁹

As a consequence of his observations about scientific theories breaking with established modes of thought, "novel theories are almost certainly already refuted by experience and experiment when they are born, so that the methodology of conjecture and refutation, his particular *bête noire*, could not possibly be applied to them" and "[if] we see science as the endeavour to construct an adequate conception of the natural world," then the kinds of procedures which Feyerabend shows us to have actually occurred in "the history of science at certain times and places of particular importance, is just the kind of method that would be called for."¹⁰⁰

Feyerabend draws quite a bit of resistance for his idea that separation of church and state provides an adequate guide to solving the kinds of ideological problems he sees present in the sciences. Joseph Agassi, assessing Feyerabend's move to separate state from science, concludes the analogous "separation of state and church does not imply any separation of politics and religion....Let us assume that science does have authority, that the authority of science exercises power, and that at times it does this quite unjustly." Agassi brushes this aside as "excessively naive," "[a] prime

example...of a case where the scientific authority and the political authority are fused, is where the state legitimises science and the authority of science legitimises the state. This, indeed, ought to be prevented." He then asks "[is], then, Feyerabend right? No. To the extent that we can speak of the authorities of science separately from science, then we do need to control them and prevent them from misusing their power—on the condition that they can and would participate in public affairs no less than the Pope....[Separation of state and science] is useless."¹⁰¹

Still further, though Feyerabend's approach has admittedly had an "advantage: it is a discussion within the politics of science. This is quite unusual: most writers about science prefer to pretend that science and politics do not mix"¹⁰², he invites refutation for declaring "science an intellectual system that competes with other intellectual systems, and that its claim for superiority to all competitors is but an expression of its cultural imperialist tendencies....The option that science is not intellectually superior to magic is but a teaser. He clearly offered it as a mere challenge: he did not consider it seriously."¹⁰³

This alludes to passages in Feyerabend where, for example, he maintains "Voodoo has a firm though still not sufficiently understood material basis, and a study of its manifestations can be used to enrich, and perhaps even to revise, our knowledge of physiology"¹⁰⁴ and the demand to "either call quarks and Gods equally real" because neither have been empirically observed, "but tied to different circumstances, or altogether cease talking about the 'reality' of things and...use more complex ordering schemes instead."¹⁰⁵ This is a too-frequent criticism by his contemporaries: however much they grant the legitimacy of the arguments "underlying" his prose, he is simply being provocative for its own sake or that he is an

⁹⁷ Harré, 295.

⁹⁸ The point Harré criticizes here is Feyerabend's suggestion that the philosophy of science should not be treated as any more rigid an activity than ordinary process of interpretation we use every day—it is simply a hermeneutical practice of understanding science with all the ambiguities and diversity of perspectives that the hermeneutics involved in reading may have.

⁹⁹ Ibid. Note that since the 1970s it has been incrementally more accepted that indigenous knowledge indeed *should not* be neglected, so this is no longer a controversial point.

¹⁰⁰ Ibid. 297.

¹⁰¹ Agassi, "The Politics of Science," 44.

¹⁰² Agassi, *Popper and His Popular Critics*, 67.

¹⁰³ Ibid. Feyerabend may have perfectly serious in this belief.

¹⁰⁴ *Against Method*, 36.

¹⁰⁵ Ibid. 89.

unremarkable postmodernist.¹⁰⁶

Feyerabend defended himself from criticism in countless reply articles published in various journals throughout his later life, often reproduced in his books—" [State university science departments] are financed by taxpayers. They are therefore subjected to the judgement of the taxpayers *and not* to the judgement of intellectual parasites who live off public money.... Experts have a vested interest in their own playpens, and so naturally they will argue that 'education' is impossible without them."¹⁰⁷ Positioning his arguments against critics he sees wanting to preserve "Western oriented history, Western oriented cosmology, ie. science" he believes "democracy *as conceived by its current intellectual champions*...will never permit the complete survival of special cultures."¹⁰⁸ Feyerabend also contends he is not as politically radical as his critics assume—"I regard anarchism as 'excellent medicine for epistemology and the philosophy of science'...[one] takes medicine for a time, *and then one stops*.... Anarchism, I say, will heal epistemology and *then* we may return to a more enlightened and more liberal form of rationality.... I am not too enthusiastic about political anarchism."¹⁰⁹ He frequently, through close reading of reviews about his works, determines his critics are "illiterate" without the necessary sensitivity to irony, rules of argument or basic literary devices. As for criticisms of a science unencumbered by political ideology, "[just] as all religious traditions in a democratic state should have the same rights, all cognitive traditions should receive the same conditions for

¹⁰⁶ Feyerabend at various times calls Marxism a "stupid religion" and seeing as his suspicion of ideology potentially or necessarily including ideologies like feminism and other leftist theories, one could give Feyerabend's arguments a more conservative frame than his readers have traditionally given, though it is hard to say how far that reading could go (he certainly appears at any rate, from surveying his works, to be a philosophical classicist who can seemingly find an ancient source for just about any modern or postmodern assertion). He is deliberately subversive on enough points to make categorizing his "school of thought," if any, difficult. This cannot be said for very consciously anti-patriarchal or anti-capitalist postmodern authors who leave little ambiguity as to their political leanings, however much ambiguity is left in their prose. To group him with postmodernism proper is hasty, and the same can of course be said for other thinkers, even ones intimately tied with postmodernism, grouped in a similar way.

¹⁰⁷ *Science in a Free Society*, 135.

¹⁰⁸ *Ibid.*

¹⁰⁹ *Ibid.* 127.

survival."¹¹⁰ If "scientific results are not only influenced but even constituted by values, then we must take a new look at the role scientists play in our societies."¹¹¹ It is made evidently clear by his views in other areas that it is not in Feyerabend's interest to argue for any single, dogmatic solution to bringing that about.

Whatever the flaws in his style or argument, the democratizing of science of the kind he calls for is not to be overlooked, and is developed in detail in Rupert Sheldrake's *Seven Experiments That Could Change The World* which calls for "grassroots" science, taken up by ordinary citizens with ordinary means, to participate in realms of research often ignored by institutional research bodies. In it, Sheldrake explains that institutionalization in the 19th and 20th centuries made amateur science and its concerns—like those of Darwin, he argues—more and more fringe while professional science and its concerns—along with the funds needed to explore evermore expensive areas of study—have taken over. His solution is a possible relationship between amateurs and professionals—"the former having a greater freedom to pioneer new areas of research" with the latter having "a more rigorous approach," expanding and integrating discoveries.¹¹² For this purpose he designs his book to appeal to the amateur—who in earlier times made significant contributions to the sciences—and using deliberately "fringe" scientific questions to invite readers to try experiments and avenues of research which do not require extensive laboratories or any elaborate apparatus. He presents such questions as whether pets have telepathy as potentially worthwhile to explore, or potentially not, to invite amateur research and genuine testing of the hypotheses which may be outright dismissed by more conservatively-minded professional scientists. The political implications of non-professional individuals researching these questions are that it promotes bodies of knowledge otherwise "disproven" as legitimately in need of first-hand inspection, and that the objectivity of institutional science "fundamental to the worldview of materialists, rationalists, secular humanists, and all others who uphold the superiority of science over religion, traditional wisdom, and the arts" is opened up to further perspectives and findings.¹¹³

In *What Is Life?*, Erwin Schrödinger, considering the physical basis of consciousness,

¹¹⁰ Preston et al., 13.

¹¹¹ Feyerabend, "Science and Ideology," 155.

¹¹² Sheldrake, xv.

¹¹³ *Ibid.* 165.

states a "rationalist may be inclined to curtly deal with this question, roughly as follows...consciousness is linked up with certain kinds of events in organized, living matter, namely, with certain nervous functions. How far back or 'down' in the animal kingdom there is still some sort of consciousness, and what it may be like in its early stages, are gratuitous speculations...and thus of no value to knowledge."¹¹⁴ He then states this approach leaves "an uncanny gap...in [the rationalist] picture of the world....[It is] extremely improbable that our understanding of the world represents any definite or final stage...[by] this I do not mean merely that the continuation of our research in the various sciences, our philosophical studies and religious endeavor are likely to enhance and improve our present outlook...[we] may be approaching the end of a blind alley, we may even have reached it."¹¹⁵ It is as true in this century as it was in the last that we simply do not know enough to be dogmatists especially with implements as potent as the sciences, and our survival depends on it—as of 2014 "[an] IPCC report reaffirms that the 'vast majority' of known fuel reserves must be left in the ground to avert intolerable risks to future generations. Meanwhile the major energy corporations make no secret of their goal of exploiting these reserves and discovering new ones....[The] 'most appropriate metaphor for the insanity of our times' is the Siachen Glacier, where Indian and Pakistani soldiers have killed each other on the highest battlefield in the world. The glacier is now melting and revealing 'thousands of empty artillery shells, empty fuel drums, ice axes, old boots, tents and every other kind of waste that thousands of warring human beings generate' in meaningless conflict."¹¹⁶

Conclusions

If we grant to Feyerabend that "science as a whole is founded on ideology"¹¹⁷ along with his exploration of same, we can conclude that there is no ideology-free science just as there is no theory-free observation, and attempts to understand science as operating somehow outside domains shaped by human affairs will meet considerable issues. This is not to say politics is all there is to life—human existence is as ornate and sublime in its dimensions as nature itself.

Feyerabend concludes in *Conquest of Abundance* that the world in which we live is fundamentally ineffable, that no word, theory or doctrine has scratched its surface. For this reason the sciences are needed, art is also needed, literature is needed, conversation, songs, games, romance, self-exploration, experimentation with psychoactive substances, dreaming—none of these are distractions or impure methods of uncovering the mysteries in which human life is embedded and which surround us to depths no mind or instrument has ever sounded. These domains do not have to be "purified" or raised to the merits of the sciences, they have a dignity of their own as explorative tools just as cultures have an inalienable dignity, even if they are to determined after being tried to have failed to uncover anything meaningful.

The work of the sciences makes legitimate discoveries and in its long history has provided the human race with tremendous abilities and knowledge that have made our primate origins unrecognizable to us and this is truly remarkable. It has also made remarkable cruelty possible in the form of genocidal othering of worldviews, in the destructive ecological practices it facilitates, in the increasingly efficient weapons it continues producing to feed military-industrial complexes at the expense of innocent lives—science is not like the sword in the stone which only obeys its chosen hands, it can as be readily manipulated to serve what is worst for survival of life on Earth including human beings as it can to serve what is best. The human race simply does not know enough to sacrifice life on Earth to pursue the illusions of certainty provided by scientific materialism or that of any other belief system.

A future in which ideology and science, as it is recognized today, are fully uncoupled is uncertain and may be impossible. By making the facilities and the institutions where the sciences do their work if not open to the layperson, then responsible to the layperson, a future where fatal mishandlings of scientific knowledge regularly occur may be avoided. This is not to say people with scientific training should be put out of a laboratory position to give laypeople run of it, merely to say that in a more integrated and transparent society science ought to serve life on the planet and the knowledge thereof, and ideologies which would have it the opposite way would meet with the proper opposition. It may go a long way to uncouple the state mechanisms which make science subservient to the daily-changing needs of economic ideology and turn them incrementally towards freeing the communities of the world to similar subservience.

¹¹⁴ Schrödinger, 93.

¹¹⁵ Ibid. 94, 103, 104.

¹¹⁶ Chomsky, "The End of History?"

¹¹⁷ Feyerabend, "Science and Ideology," 154.

The sciences are among the greatest achievements humanity has mustered against vertigo-inducing horizons of uncertainty—to know ourselves and our environment is of crucial importance, and to allow it to continue playing any part in widespread extinction, dehumanization, futile global wars, or environmental collapse would be a cruel display of irony. It is therefore necessary to any future worth having that "those who look at the rich material provided by history, and who are not intent on impoverishing it in order to please their lower instincts, their craving for intellectual security in the form of clarity, precision, 'objectivity' [or] 'truth'"¹¹⁸ emerge out of what Immanuel Kant describes as self-imposed immaturity, "the inability to use one's own understanding without another's guidance. [It] is self-imposed if its cause lies not in lack of understanding but in indecision and lack of courage to use one's own mind without another's guidance....'Have the courage to use your own understanding,' is therefore the motto of the enlightenment."¹¹⁹

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¹¹⁸ *Against Method* 18.

¹¹⁹ Kant, ¶ 1.

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