Feyerabend, funding, and the freedom of science: the case of traditional Chinese medicine

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Abstract

From the 1970s onwards, Feyerabend argues against the freedom of science. This will seem strange to some, as his epistemological anarchism is often taken to suggest that scientists should be free of even the most basic and obvious norms of science. His argument against the freedom of science is heavily influenced by his case study of the interference of Chinese communists in mainland China during the 1950s wherein the government forced local universities to continue researching traditional Chinese medicine rather than Western medicine. Feyerabend claims this move was justifiable and, eventually, vindicated by the resulting research which was beneficial for locals and the West at large. The purpose of this paper is to provide a comprehensive overview and analysis on Feyerabend's views on the freedom of science and his social commentary on US science funding policy that follows therefrom. This proves to be exceedingly difficult because Feyerabend's writings on the subject are filled with gaps, unnoticed tensions, and cognitive dissonance. Still, I think Feyerabend's scattered insights and the contradictions that emerge lead to an interesting microcosm of the issues contained in the freedom of science debate.

Keywords Freedom of science · Feyerabend · Pluralism · Science funding policy · Traditional Chinese medicine

Preamble

[I]nstruct democracy...to substitute little by little.
the science of affairs for its inexperience,
and knowledge of its true instincts for its blind instincts;
to adapt its government to time and place;
to modify it according to circumstances and men.
(de Tocqueville, 1889/2002, 7).

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The freedom of science debate encompasses many issues in the broader debate of the proper place of science in democratic societies. One common focus of this debate revolves around science funding policy, more specifically, questions over procedures to decide what the priorities of publicly funded research should be. Within these debates, there are several competing considerations for science funding policy that often emerge: we should hedge our bets and explore science in diverse ways, long-term scientific progress cannot be readily anticipated, scientists should be allowed to follow their curiosity, and science should be accountable to the public by providing useful knowledge. Paul Feyerabend is someone who argued for *all* of these conclusions. How did Feyerabend manage to provide a coherent framework that accommodated these seemingly incompatible demands? In a sense, he was unable to do so. Indeed, Feyerabend seemed largely unaware of the tensions contained in this bundle of claims. However, his failure to do so not only provides an interesting microcosm of the issues contained in the freedom of science debate but is also highly instructive on a number of fronts. Specifically, he draws a number of helpful distinctions between urgent and luxury science, democratic supervision and democratic participation, and mature and immature democracies. These distinctions, ones Feyerabend did not draw neatly himself, help maneuver the difficult terrain of the freedom of science debates.

To make matters more confusing, Feyerabend's discussion of the freedom of science is fraught with cognitive dissonance. He repeatedly pronounced himself as an arch critic of the freedom of science and proposed that science should be democratically supervised. Nowhere is this position applied more forcefully than in his analysis of Bauman amendment where he defends the need for public oversight on NSF budget proposals. But this analysis, and his antagonism towards the freedom of science, reflects a failure of Feyerabend to learn his own lessons. The failure, or so I will argue, is that he did not pay due attention to the particularities of the Bauman amendment and its surrounding context. Once again, Feyerabend's failure is instructive of more modern struggles of constructing policy-relevant philosophy of science.

In this paper, I offer a comprehensive overview and analysis of Feyerabend's variegated arguments concerning the freedom of science. After providing some background intellectual context, I unpack Feyerabend's analysis of the interference of the Chinese Ministry of Health in the choice of research projects at Chinese universities. Here, he praises the Chinese communists for redirecting priorities within the medical community and reinvigorating research on traditional Chinese medicine. I then show that Feyerabend unwittingly provides conflicting justifications for the freedom of science – one which follows from his analysis of the Chinese communists and another from his views of science in a free society. I then further elaborate on Feyerabend's defense of the democratization of science through his debate with Michael Polanyi's argument from tacit knowledge and conclude by criticizing Feyerabend's application of his antagonism towards the freedom of science to the Bauman amendment which sought to provide Congressional oversight to budget proposals of the National Science Foundation.

1 Some background considerations

Feyerabend's interest in medicine was both academic and personal. Academically, as will become apparent, his interest is consonant with his radical brand of pluralism where science should operate without epistemic constraints and there is no important distinction between science and non-science. Personally, Feyerabend continuously suffered from chronic pain and depression resulting in constant interaction with medical practitioners. Due to his wealth and geographic proximity, he could afford diagnosis and treatment at the MAYO clinic and a variety of doctors and specialists around the world. But Feyerabend also went to 'witch doctors' and 'mystics' and, moreover, convinced those who approached him to try their remedies:

T[ibbetts] also asks: 'If he had a child diagnosed with leukemia would he look to his witchdoctor friends or to the Sloan Kettering Institute?' I can assure him that I would look to my 'witchdoctor friends' to use his somewhat imprecise terminology *and so would many other people in California* whose experience with scientific medicine has been anything but encouraging (Feyerabend, 1978a, 184).

This recommendation, Feyerabend tells us, led to successes unmatched by Western approaches (ibid). He elaborates on the details of his personal medical experiences where the availability of alternative approaches proved essential for successful treatment:

For the past half year I have been losing weight, about 25 pounds by now, I got double vision, stomach cramps, I fainted in the streets of London and felt generally miserable. Naturally, I went to a doctor. The general practitioners... did not do me much good. I went to specialists. For three weeks I was subjected to a battery of tests; I was given X-rays, emetics, enemas and each examination made me feel worse than ever. Result: negative... As far as science is concerned, I am as fit as a fiddle. Not being restricted by an undying loyalty to science I started looking for other kinds of healers and I found there are lots of them. Herbalists. Faith healers. Acupuncturists. Masseurs. Hypnotists... The second man I consulted told me I had been severely ill for a long time (and that is true: for the past 20 years I wavered between long periods of health and other periods when I was hardly able to totter along, but without any scientifically detectable signs of illness), that he was going to treat me twice in order to see whether I responded and that he might take me on if I did. After the first treatment I felt better than I had felt for a long time and there were physical improvements as well, a long-lasting dysentery stopped and my urine cleared up. None of my 'scientific' doctors had been able to achieve that. What did he do? A simple massage which, as I found later, stimulated the acupuncture points of liver and stomach. Here in Berkeley I have a faith healer and an acupuncturist, and I am now slowly recovering (Feyerabend, 1978b, 136-7).

Feyerabend's experiences, as he discovered through personal interactions, anecdotes, and documentation on the uses of alternative medicines, were common and there were

reoccurring trends wherein alternative treatments outperformed their ‘mainstream’ rivals despite their lack of being ‘scientific.’ These lessons reinforced and developed Feyerabend’s existing convictions regarding the importance of pluralism.

Feyerabend’s interest in medicine is closely connected to his discussion of the freedom of science. Feyerabend claims that his ultimate goal is to improve happiness (Feyerabend, 1968, 134; 1975a, 7–8; 1981a, 65). Genuine happiness, Feyerabend tells us, is closely intertwined with freedom: “the most important question of all [is] the question of what extent the happiness of individual human beings, and to what extent their freedom, has been increased” (Feyerabend, 1970, 209).¹ Medicine is a perfect, though certainly not exclusive, terrain for this topic. Treatments and research that underpins them is deeply tied to bodily, spiritual, and political choices – ones where freedom should reign as a supreme value (Feyerabend, 1978b, fn. 28 97).

While Feyerabend is convinced of the importance of freedom for *individuals*, the freedom of *science* is another issue altogether. As Torsten Wilholt puts it:

A second ambiguity concerns the question of who is the subject of this freedom. At first glance, this seems to be the individual scientist. But curiously, certain limitations of scientists’ freedom, such as their dependence on research group leaders, or on supportive reviews by their peers for grant approval, are not commonly criticized under the rubric of freedom of research. Thus, it sometimes appears to be rather the right of a research community or even an entire discipline to determine its own research agenda by means of appropriate procedures of self-government which is the major concern behind appeals to scientific freedom (Wilholt, 2010, 175).

Perhaps surprisingly to some, Feyerabend is critical of this kind of freedom. Understanding Feyerabend position on this issue is tricky for several reasons. First, large portions of Feyerabend’s remarks on the freedom of science are sporadic, leaving many questions unanswered directly. Second, Feyerabend had many unresolved tensions in his thought and developed seemingly incompatible arguments against the freedom of science. Third, the usual difficulties with separating Feyerabend’s rhetorical strategies from his convictions are especially prevalent on a topic that was so close to his heart. While these obstacles make the task difficult and messy, they do not make it impossible. As is usually the case, Feyerabend’s stance on the freedom of science is a unique one worthy of attention.

2 The case of the Chinese communists

2.1 Scientific Chauvinism and traditional Chinese medicine

Feyerabend outlines what he takes to be a “familiar development” (Feyerabend, 1993, 36): Universities in China had been studying medicine in a thoroughly ‘unscientific’ manner and were thus condemned and discarded:

¹ One can sense Feyerabend’s frustration with the lack of respect for self-determination and its connection to Hopi medicine (see Feyerabend, 1981b, 29).

Early in the 20th century a new generation, tired of the old traditions and the restrictions implicit in them and impressed by the material and intellectual superiority of the West imported science. Science soon pushed aside all traditional elements. Herbal medicine, acupuncture, moxibustion, the yin/yang duality, the theory of the chi were ridiculed and removed from schools and hospitals, Western medicine was regarded as the only sensible procedure (Feyerabend, 1978b, 102).

This results in a situation in which traditional Chinese medicine (TCM) becomes marginalized in favor of ‘Western’ approaches. This elimination came about from a younger generation of scientists within the Chinese academy and Marxist activists who associated TCM with eighteenth and nineteenth century feudalism such that “Chinese medicine was still inextricably bound up with a dying, but not yet dead, traditional social and cultural order” (Crozier, 1968, 151). This association was combined with a newfound appreciation of recent discoveries from the West. This combination of the suspicious ideology of TCM and the modern inventions of Western medicine motivated a movement from the 1920s until the late 1940s Feyerabend calls ‘scientific chauvinism’:

A new generation recognizes or thinks it recognizes the material and intellectual superiority of the West and traces it back to science. Science is imported, taught, and pushes aside all traditional elements. Scientific chauvinism triumphs: ‘What is compatible with science should live, what is not compatible with science, should die.’ ‘Science’ in this context means not just a specific method, but all the results the method has so far produced. Things incompatible with the results must be eliminated (Feyerabend, 1993, 36).

Scientific chauvinism refers to the phenomena where a set of practices (Western medicine in this case) is labeled ‘scientific’ and, when combined with the presumption that non-science is somehow problematic, leads to the elimination of conflicting practices. Scientific chauvinism is anti-pluralist since it tries to eliminate research and, as anyone familiar with Feyerabend will know, is therefore unwarranted (see Shaw, 2017). Inconsistent with Western medicine is a set of somewhat discontinuous approaches from China and surrounding countries (e.g., herbal medicine, acupuncture, moxibustion). Feyerabend follows common vernacular and uses the blanket term ‘TCM’ (even though some of them were not uniquely Chinese) to cover them. These approaches faced elimination in the sense that doctors were losing access to TCM training and the resources necessary to further research in the academy.

In 1954, the Chinese Ministry of Health began to resuscitate interest in TCM through an increased state involvement in Chinese universities, research clinics, and hospitals. Feyerabend defends this move as saving pluralism from scientific chauvinism:

it provided the counterforce that was needed to overcome the scientific chauvinism of the time and to make a plurality (actually a duality) of views possible. (This is an important point. It often happens that parts of science become hardened and intolerant so that proliferation must be enforced from the outside, and by

political means. Of course, success cannot be guaranteed - see the Lysenko affair. But this does not remove the need for non-scientific controls on science) (ibid).

The interference of the Ministry of Health was the necessary ‘counterforce’ to scientific chauvinism to reinforce pluralism. To be clear, Feyerabend is not claiming that the *state* is necessary for imposing such interference; it can be *any* institutional body with the power to push science in directions that go against its directionality. It is any ‘extra scientific agency’.

whose power is sufficient to overcome the most powerful scientific institutions. Examples are the Church, the State, a political party, public discontent, or money: the best single entity to get a modern scientist away from what his ‘scientific conscience’ tells him to pursue is still the dollar (ibid).

Indeed, funding policy and institutional investments were key tools for reinvigorating research into TCM (e.g., the founding of the Chinese Medical Research Institute (Crozier, 1968, 179)).² Such moves were needed, Feyerabend claims, because science has developed, according to its own inertia, to become intolerant and eliminate diversity in favor of a preferred set of approaches. Since scientific chauvinism was a widespread feature of the scientific community, *external* bodies were required to overcome it.

Feyerabend claims that the interference of the Chinese communists was vindicated given the resulting successes of the pluralism of TCM and Western medicine:

Now this politically enforced [pluralism] has led to most interesting and puzzling discoveries both in China and in the West and to the realization that there are effects and means of diagnosis which modern medicine cannot repeat and for which it has no explanation. It revealed sizeable lacunae in Western medicine (Feyerabend, 1993, 37; see also 1975b, 7-8).

Pluralism allowed each perspective to benefit from one another in a way that Feyerabend sees as typical (see Feyerabend, 1978a, 184; 1978b, 77–78). That pluralism was beneficial in this case has been echoed by historians. For example, Chen Keji and Xu Hao recount the following events during the mid 1960s until the 1970s:

During this period there were many achievements on the basis of an integration of Western medicine and TCM, such as acute abdomen pain treated by a team headed by Wu Xianzhong, fractures treated under the supervision of Shang Tianyu, cataracts treated by a team headed by Tang Youzhi, and cardiovascular diseases treated under the supervision of Chen Keji – for instance, treating acute myocardial infarction with both Western and Chinese medicine, especially the prescription of an injection tonifying *qi* and promoting blood circulation (Keji & Hao, 2003, 231).

Integration led to new discoveries and has largely been stimulatory on several technological, theoretical, and practical fronts (Chan, 2016; Dobos & Tao, 2011;

² There were also large-scale attempts to integrate TCM doctors into hospitals and research-oriented clinics (Crozier, 1968, 175–179).

Jiang et al., 2010; Keji & Hao, 2003; Lu et al. 2008). Crozier also discusses one of the primary reasons for the reinvigoration of TCM was its usefulness during the second Sino-Japanese war (Crozier, 1968, 154–5) and its economic viability (161ff). The forced reinvigoration of TCM was not only successful, eventually,³ in overcoming scientific chauvinism – it also stimulated progress in a way that can be anticipated by Feyerabend's pluralism.

Moreover, different medical practices appeal to different value sets which is important for the flourishing of distinct parts of society:

Difference in standards and values plays an even greater role in medicine: Western 'scientific' medicine aims at the smooth functioning of the body-machine no matter what its feelings or its aesthetic appearance; other forms of medicine are interested in feelings, intuitive abilities, special achievements, prophecy, Shamanism, that cannot be measured in materialistic terms (Feyerabend, 1980, 13).

This is a distinct argument for pluralism, since it does not ground itself in mutual progress but in providing options for different value sets.⁴ Finally, alternatives provide treatments that are available *while* Western medicine developed its responses providing aid during intermittent stages of research. Pluralism benefited all; a lesson Feyerabend draws over and over again.

2.2 Comparative analysis with the Lysenko affair

Feyerabend notes that intervention in science is not always bound to succeed. The most famous example is the Lysenko affair which many thinkers use as an instance of the disastrous impacts that can arise from external interference in science (see Hansen, 2008). While Feyerabend is also critical of the Lysenko affair, he does not draw the same lesson about the freedom of science. Rather, Feyerabend locates the problematic aspects of the Lysenko affair with the *totalitarian* means by which the Soviet state interfered in the development of genetics:

Considering the sizeable chauvinism of the scientific establishment we can say: the more Lysenko affairs the better (it is not the *interference* of the state that is objectionable in the case of Lysenko, but the *totalitarian* interference which kills the opponent rather than just neglecting his advice) (Feyerabend, 1975a, 7).

The problem was not that Lysenko's views on vernalization, tree grafting, and Larmarkian inheritability were pseudoscience; Feyerabend welcomed them to a pluralistic dialogue on genetics: "Lysenko made some good points in opposition

³ Crozier mentions initial problems that ensued from the "forced marriage" of Western medicine and TCM (Crozier, 1968, 183).

⁴ Preston helpfully uses the metaphor of a grocery store to illustrate this point, where many options are available for choosing by different customers. The job of science, on this view, is to stock the shelves (Preston, 2000).

to the one-sided genetic predictions of his time” (Feyerabend, 1987, 159).⁵ Rather, the problem was that dissenters, proponents of traditional Mendelian genetics, were silenced. Pluralism was eliminated during the Lysenko affair while it was created in the case of the Chinese communists. Beyond the clearly morally disturbing features of the means of silencing dissenters, Stalin’s counterforce simply enforced monism in the opposite direction; it does not instill the diverse community Feyerabend envisages. While the Chinese communists were certainly totalitarians in many respects, they did not (or perhaps could not) achieve what Stalin did in imposing hegemony upon the relevant epistemic communities. In other words, they were not totalitarians in their actions in the sense that they never eliminated or even stalled pluralism; they accomplished the opposite. Thus, Feyerabend distinguishes between two classes of political interference (my terms):

- (1) Protective Interference.
- (2) Totalitarian Interference.

The aim of (1) is to provide a “deliberative enclave” (Sunstein, 2002) for research that needs rehabilitation or is threatened by natural developments within scientific communities. Scientific chauvinism, in its many guises, is one such natural development that suffocates some intellectual endeavors under some ‘rationalistic’ conception of scientific method (see Shaw, 2020a). The aim of (2) is to establish a preferred approach at the expense of others. The case of the Chinese Communists is an instance of (1) whereas the Lysenko affair is an instance of (2). Feyerabend claims that we should not generalize from the problematic aspects and consequences of the Lysenko affair, or type-2 cases, to all cases of state interference (Feyerabend, 1993, 160). For Feyerabend, this generalization is unjust since the interference of the communists had appealing benefits. Interference in the service of (1) is distinct in kind from (2). More to the point, interference for the sake of (1) is justifiable whereas (2) is not.

3 Feyerabend and the freedom of science

The TCM case study could mislead one into thinking that Feyerabend defends an unwieldy state power where the state can interfere on a whim and be purely reactive.⁶ But his vision is not precisely what happened in China. Indeed, the Chinese government was not acting with the intent of promoting pluralism, though this happened to be the consequence of their actions. His alternative to free science is the *democratic supervision* of science by laypeople. Feyerabend’s discussion of democratic supervision appears in scattered, abrupt bursts throughout his works (Feyerabend, 1970/1999, 119; 1975c, 168; 1978b, 96–8; 1981a, fn. 4 66; 1993, 37). However, his discussions have an uneven relationship with the lessons he draws from the

⁵ For related discussion, see Gordin (2012).

⁶ Agassi, for example, claims that “Feyerabend’s ideal is totalitarian China” (Agassi, 1976, 167). See Feyerabend (1978b, 126ff) for his response.

TCM case study. Specifically, he unwittingly uses a distinct argument for democratic supervision, namely that it is constitutive of science in a free society, which appears inconsistent with the lessons drawn from the TCM case study. In this section, I show how Feyerabend accidentally solves this unnoticed tension in his discussion of ideal politics.

3.1 Feyerabend on democratic supervision

We saw that, for Feyerabend, external interference with the natural development of science is perfectly permissible insofar as it is not done with an eye towards enforcing monism one way or the other. The primary means of systematically enabling external interference, Feyerabend claims, is via democratic supervision. One argument he gives for democratic supervision follows from his views on pluralism. Consider the following passage from *Science in a Free Society*, where Feyerabend claims that citizens can and should critically engage with scientific claims:

Laymen can and must supervise Science... it would not only be foolish but downright irresponsible to accept the judgment of scientists and physicians without further examination. If the matter is important, either to a small group or to society as a whole, then this judgment must be subjected to the most painstaking scrutiny (Feyerabend, 1978b, 96; see also 1980, 9-10).

Here, democratic supervision is justified due to the *critical* function citizens play in evaluating scientific research. Citizen perspectives contribute to the pluralistic discourse necessary for a ‘painstaking scrutiny’ making their inclusion an expansion of Feyerabend’s pluralism. Similarly, the value judgments implicit in science should similarly be examined democratically. One could see Feyerabend welcoming developments like citizen participation in funding priority decision-making procedures (Simonsen, 2018) and many kinds of citizen science (Roe, 2021). Let’s call this the ‘argument from pluralism.’ The argument from pluralism follows naturally from the TCM case where outside (though not democratic, per se) interference in science promotes critical diversity which led to the fruits pluralism is expected to produce.

But why are citizens justified in *supervising* science? The argument from pluralism entails that citizens should *participate* in scientific dialogues, not supervise them. A supervisor is defined by an asymmetry in power, where they hold decision-making authority and need only consider advice from scientists if they see fit. A participant has equal power to their peers, and their only function is to have continuing critical input into scientific inquiries and have a platform to argue for their convictions. The argument from pluralism requires that a diversity of views be ‘at the table’ and discussed openly (see Shaw, 2020b). This argument does not support the *extra* power bestowed upon citizens to dictate decisions.

Feyerabend provides a different argument for this additional supervisory power that he affords to laypeople. He claims that democratic supervision *is constitutive of science in a free society*. In other words, democratic supervision is entailed by the

basic rights citizens are entitled to in a free society. In a free society, Feyerabend claims, every citizen has the right to “pursue what he *thinks* is truth” and, therefore,

Assuming this right, a citizen has a say in the running of any institution to which he makes a financial contribution, either privately, or as a taxpayer: state colleges, state universities, tax supported research institutions such as the National Science Foundation are subjected to the judgment of taxpayers... The last word is the decision of democratically constituted committees, and in these committees laymen have the upper hand (Feyerabend, 1978b, 86-7).

Feyerabend even claims that democratic supervision is justified *even if it makes for worse science* (87). These rights follow from his notion of *freedom*. To live a free life, individuals must have resources to help them live the life they want – knowledge is one such resource. Thus, citizens have a positive right to knowledge. According to Feyerabend, this right entails that citizens should be allowed to have an active role in determining what knowledge should be produced and how. Result: science should produce the *right kinds of knowledge* where the ‘right kinds’ is to be determined democratically. As Nancy Cartwright puts it, science should “answer the right questions in the right ways, where value judgements and methodological issues are inextricably intertwined in determining what is right” (Cartwright, 2006, 982). Call this the ‘argument from democracy.’ Feyerabend argues as though there is no contradiction between the arguments from pluralism and democracy, but clearly there is: citizens may be scientific chauvinists and reinforce monism in their preferred direction. Similarly, citizens may become dogmatically anti-scientific and attempt to censor scientific research in an anti-pluralist fashion. Doing so would be perfectly within their rights. In these cases, the external interference Feyerabend promotes would scarcely differ from the totalitarian measures taken by state officials trying to promote their own agenda. Remember that totalitarian interference, for Feyerabend, is understood as the enforcement of monism. He presumes that the general public will not do this – but this presumption is not always going to hold. As his hero, J.S. Mill, pointed out: a tyranny of the majority is tyranny, nonetheless. In these cases, Feyerabend objects to the freedom of science on incompatible grounds since the goals of increasing pluralism can conflict with the rights of citizens in a free society. Feyerabend never notices or addresses this tension directly. However, an opportunity to do so arises if we take a closer look at Feyerabend’s discussion of ideal politics.

3.2 Feyerabend on the limitations of freedom

Feyerabend’s discussion of democracy and science takes place in an idealized context – he is well-aware and explicit about this (Feyerabend, 1987, 308–311). The most important idealization Feyerabend mentions is that a genuine democracy must be composed of ‘mature people’ (Feyerabend, 1978b, 87). Mature people are informed, open-minded, creative, and actively engage with differing perspectives (see Shaw, 2017, 8–9; 2020b, 7–9; Brown, 2021). In other words, mature citizens are pluralists. Because of this, the apparent tension highlighted in the previous section

vanishes; science in an ideal society will be supervised by mature citizens who will be good pluralists and increase critical discussion by fiat. The argument from democracy relies on an ideal case in which citizens will not fall prey to scientific chauvinism. The pertinent question becomes whether these two lines of justification are compatible in specific cases (i.e., non-ideal cases). This leads us to a possibility Feyerabend openly embraces: the freedom of science or its antitheses may be viable in some contexts but not others (cf. Feyerabend, 2011, 89). Here, Feyerabend follows Mill who denies the feasibility of his liberalism in the case of the ‘barbarians’:

It is, perhaps, hardly necessary to say that this doctrine is meant to apply only to human beings in the maturity of their faculties. We are not speaking of children, or of young persons below the age which the law may fix as that of manhood or womanhood. Those who are still in a state to require being taken care of by others, must be protected against their own actions as well as against external injury. For the same reason, we may leave out of consideration those backward states of society in which the race itself may be considered as in its nonage. The early difficulties in the way of spontaneous progress are so great, that there is seldom any choice of means for overcoming them; and a ruler full of the spirit of improvement is warranted in the use of any expedients that will attain an end, perhaps otherwise unattainable. Despotism is a legitimate mode of government in dealing with barbarians, provided the end be their improvement, and the means justified by actually effecting that end. Liberty, as a principle, has no application to any state of things anterior to the time when mankind have become capable of being improved by free and equal discussion (Mill, 1859/1947, 10).⁷

Yet, this also entails that liberalism and the free exchange of diverse ideas only works in social structures with the right calibrations. Feyerabend states that “in this issue my sympathies are firmly with Mill” (Feyerabend, 1981a, fn. 6 68). The application of pluralism will not automatically lead to the promises Mill and Feyerabend make unless the circumstances are fortuitous. This does not, however, weaken their ambition for the *ideal* of pluralism. Pluralism, for Mill and Feyerabend, represents the pinnacle of human excellence; diverse, democratic, liberal societies are better than alternatives:

Mill is here interested in the development of individuality and talent. According to Mill people develop best in pluralistic societies that contain many ideas, traditions, forms of life. Such societies are also best suited for the improvement of knowledge. A plurality of views is preferable to a uniform intellectual climate (Feyerabend, 1980, 4).

Liberalism and diversity should not be *imposed* upon others, since the fruits they promise may be beyond reach. Rather, Feyerabend claims, we should slowly move towards developing a mature citizen base that can adequately supervise science.

⁷ For further discussion on this, see Sullivan (1983), Jahn (2005), Tunick (2006), and Mehta (2018). This point of agreement between Feyerabend and Mill is unnoted in the otherwise excellent essays of Lloyd (1997) and Staley (1999).

This leaves us with the view that science should only be democratically supervised in cases where we have a sufficiently mature citizen base.⁸

3.3 The axiology of science

From this, it seems as though the arguments from pluralism and democracy coincide in ideal cases. Unfortunately, this is not correct since the arguments from pluralism and democracy still disagree on axiology. The argument from democracy, as we saw, concludes that the aims of science are determined by local democratic norms. This requires that science aims at specific results, though what those results will be will vary from case to case. The argument from pluralism, on the other hand, has *no concrete axiology*. In the TCM case, Feyerabend is silent on the *particular* goals that pluralism will accomplish. He does not, *and cannot*, defend the interference of the Chinese Ministry of Health because it created democratically viable knowledge. Not only would it be silly if Feyerabend defended the interference in the mid 1950s because it would (partially) facilitate chromatographic fingerprinting in quality-of-life metrics in the 2010s, but Feyerabend repeatedly defends the view that the growth of science is *unpredictable*:

[T]he cosmologists of the 16th and 17th centuries did not have the knowledge we have today, they did not know that Copernicanism was capable of giving rise to a scientific system that is acceptable from the point of view of ‘scientific method’. They did not know which of the many views that existed at their time would lead to future reason when defended in an ‘irrational’ way. Being without such guidance they had to make a guess and in making this guess they could only follow their inclinations, as we have seen. Hence it is advisable to let one’s inclinations go against reason *in any circumstance*, for science may profit from it (Feyerabend, 1975a, b, c, 155-6).

This is also what is meant by the slogan ‘anything goes’: there is no guarantee that the known forms of rationality will succeed and that the known forms of irrationality will fail. *Any* procedure, however ridiculous, may lead to progress, *any* procedure, however sound and rational, may get us stuck in the mud (Feyerabend, 1977, fn. 1 368).

Interesting research in the sciences (and, for that matter, in any field) often leads to an unpredictable revision of standards though this may not be the intention. Basing our judgment on accepted standards the only thing we can say about such research is therefore: anything goes (Feyerabend, 1978b, 39).

His pluralism has no particular axiology, though he thinks it will be *generally* progressive (see Tambolo, 2015). A similar distinction was made by Rescher (1978,

⁸ Feyerabend seems unaware of the rich discussions of the relationship between ideal politics and non-ideal normative guidance. His argument that we should move towards an ideal theory suggest that he holds something like Rawls’ (1999) end-state view of ideal politics. If this is true, then Feyerabend’s view is susceptible to the many criticisms that have been leveled against Rawls’ view (see Larroulet Philippi, 2020 and the citations therein for further discussion).

3–4): the *content* of future science, including what tasks it will be suited to serve, may be unpredictable but it is predictable *that* there will be progress. However, this differs from Feyerabend's view that science should aim at democratically viable knowledge, which has its axiology specified by democratic procedures. Thus, even in ideal cases, the argument from pluralism will push in a different direction than the argument from democracy.

Once again, we see a tension in Feyerabend's thought that he did not appear to recognize. Roughly, we can see Feyerabend attempting to hold two incompatible positions. One where we investigate the world through an unrestricted array of research programs with nothing but open minds about what we will find and the other where our investigations of the world are highly circumscribed by democratic deliberations to deal with concrete problems. Luckily, unintentionally, a remark in Feyerabend's later lectures can reconcile these pictures of inquiry:

introducing and defending world views that clash with established principles of modern science is not irrational and may even produce discoveries sometime in the distant future. But there are problems that need to be addressed right now. It is therefore wise to stay with ideas which already have results instead of wandering off on a tangent. This is good advice, provided the results are relevant for the problems. Not all scientific research satisfies this condition (Feyerabend, 2011, 43–44).⁹

This view, which has been elaborated elsewhere, balances conflicting views about the directedness of science (see Shaw, 2021). In *urgent* cases, we delimit pluralism in accordance with the demands for achieving specifiable ends. Here, we do not invest resources in highly speculative research since its possible returns are too distant in the future relative to the task at hand. Whatever pluralism we embrace will be limited in accordance with local decisions about the epistemic and moral features of a particular context. In these cases, the final say should be determined democratically. In *luxury* cases, we should be allowed to 'wander off', let our imagination run free,¹⁰ and explore openly in a pluralistic manner (see Branscomb, 1999). Science does not need to be curtailed because it does not aim towards anything in particular – it only grows by diverse explorations complementing and competing with one another. This entails that democratic supervision has *different functions in ideal cases*. In luxury cases, democratic supervision only entails more perspectives for critical discussion (though this may be limited in accordance with the demands of urgent science). Given that this function isn't really 'supervision', we may more accurately call this function 'democratic participation.' In urgent cases, democratic supervision is necessary to ensure that science is put to the right ends. We thus arrive at the following view:

⁹ See de Oliveira (2014, 140ff) for related analysis.

¹⁰ Stuart (forthcoming) emphasizes the epistemic and ethical arguments Feyerabend makes for free imagination, but perhaps the projects which we pursue and, therefore, imagine about should not be entirely free.

Democratic supervision is warranted in cases of urgent science.

Democratic participation is warranted in cases of luxury science and some cases of urgent science.

4 Feyerabend and Polanyi on the freedom of science

Many of Feyerabend's immediate colleagues defended the freedom of science including Toulmin (1966), Lakatos (1978), and Bourdieu (1975).¹¹ Towering figures from the previous generation, such as Friedrich Hayek (1941), argued in similar directions. One of the most famous defenses, though, comes by way of Polanyi's argument from tacit knowledge.¹² Before accepting Feyerabend's rejection of the freedom of science (where the political machinery and citizenry are mature), we must see how Feyerabend is able to overcome this argument. Polanyi writes that.

the forces contributing to the growth and dissemination of science operate in three states. The individual scientists take the initiative in choosing their problems and conducting their investigations; the body of scientists controls each of its members by imposing the standards of science, and finally, the people decide in a public discussions whether or not to accept science as a true explanation of nature...*any attempt to direct these actions from outside must inevitably distort or destroy their proper meaning* (emphasis added, Polanyi, 1951, 58).

Scientists gain tacit knowledge through ongoing participation in particular practices and this guides them in their decision-making. This tacit knowledge “bring[s] into play intellectual powers which are otherwise hidden and assert[s] creative forces of a unique kind” (Polanyi, 1946a, b, 6). Amongst other things, this includes their judgments of what kinds of critical discussions are worthy of engagement. For Polanyi, critical discussion is to be constrained by a “sufficient degree of plausibility” (Polanyi, 1962, 56). For example, Polanyi praises scientists ignoring an article published in *Nature* that the gestation period of some mammals will always be a multiple of π as something that is unworthy of critical engagement (Polanyi, 1963, 376). Scientists' judgments are essential to “prevent the adulteration of science by cranks and dabblers” (Polanyi, 1962, 61).

Feyerabend was well-aware of this argument and even included Polanyi's paper, “The Stability of Beliefs”, in his undergraduate course syllabus. He reconstructs Polanyi's view in the following way:

¹¹ See Sismondo (2011, 88–91) for a critical rejoinder of Bourdieu's defense. For a broader discussion, especially as it pertains to Kuhn see Reisch (2019). Feyerabend appears to have only been partially aware of the body of literature existing at his time on this topic.

¹² Polanyi provides many arguments throughout his career. I will focus on his most famous argument though, curiously, he provides a distinct argument which follows from the unpredictability of scientific progress (Polanyi, 1946a, b/2017, 72). As we saw, Feyerabend draws a more modest defense of the freedom of *some* science (i.e., non-urgent science) from the unpredictability thesis whereas Polanyi uses it as a *tout court* defense of the freedom of science. See Preston (1997) for a general comparison between Feyerabend and Polanyi.

The attempt to rearrange science or society with some explicit theories of rationality in mind would disturb the delicate balance of thought, emotion, imagination and the historical conditions under which they are applied and would create chaos...this is the objection raised again by Polanyi (Feyerabend, 1978b, 7).

This leads to the consequence that “there is no way outsiders can judge science. *Science knows best*” (Feyerabend, 1980, 10). Feyerabend admits that tacit knowledge remains an ineliminable feature of scientific reasoning and cannot be replaced by formal reconstructions (Feyerabend, 1987, 106). Feyerabend’s criticisms are not, then, of the usual Popperian sort (see Deichmann, 2011, 260). Rather, he claims that the argument from tacit knowledge does not support the freedom of science because.

- (1) Science makes “comprehensive mistakes involving the ‘basic ideology’ of the field that can be and often were revealed only by outsiders” (Feyerabend, 1978b, 99).
- (2) Polanyi’s view “assumes that the distinctions and separations in a certain historical stage are unobjectionable and have to be maintained” (100).

By ‘comprehensive mistakes’, Feyerabend means mistakes in the science such as methodological, ontological, or evidentiary mistakes that are endemic to the field. He illustrates this with the example of cancer research. According to the ‘analytic’ tradition, which was the paradigm for most Western academics during the 60 s and 70 s, diseases are basic elements that occupy a particular spatiotemporal location. Their causal interactions with other parts of the body lead to symptoms and other forms of deteriorations of health. Against this, according to proponents of the ‘holistic’ tradition, there are only coarse-grained, structural similarities between bodies and the term ‘disease’ refers to a functional network of entities. This view was, and still is, often treated with disdain within several medical communities. The failures of the ‘analytic’ approach can always be said to be the result of the inherent complexity of the subject matter and, therefore, there is no need for a fundamentally new approach. If holistic approaches are successful, though, then a fundamental problem with the analytic approach is revealed. Given that the holistic approach was mostly practiced by ‘outsiders’ who were ‘unscientific’ (scientific chauvinism!), this shows how fundamental mistakes can be corrected by outside perspectives.

For (2), Feyerabend relies on the well-known argument that historical traditions, what we now call ‘science’ or ‘non-science’, interact and evolve. Sometimes ‘science’ coevolves with other disciplines and other times they part ways and these disciplinary divides can take place for all sorts of reasons. Science as we know it is already a product of past interactions with ‘non-science.’ Preventing these interactions, as Feyerabend thinks Polanyi demands, would arrest these possible future developments. Indeed, Feyerabend writes at length about how the arts and sciences could mutually benefit from one another (Feyerabend, 1967). For these two reasons, Feyerabend thinks Polanyi’s defense of the freedom of science fails. More generally,

both (1) and (2) are unwarranted for the same reason; namely, they restrict criticism from outside sources.

Feyerabend's reading of Polanyi is a popular one, but it oversimplifies Polanyi's actual position. *Pace* Feyerabend, Polanyi welcomes exchanges and possible co-evolutions between science and other disciplines. In some cases, 'pure' and 'applied' science are closely connected in theory and practice and Polanyi provides his own examples of "how closely the practical and the contemplative interest are often interwoven" (Polanyi, 1956, 233). Sometimes, science has good reason to learn from practical activities like engineering:

Occasionally the invention of new sources of light has led to very interesting observations. The development of gas lighting has taught us some new things about the formation of coal gas, and the lamp industry has contributed to our knowledge of tungsten and high temperatures (Polanyi, 1945, 321).

Polanyi even outlines a preliminary taxonomy of kinds of technology and their differentiated relationship to pure science (Polanyi, 1956, 232–233). Thus Feyerabend's accusation of (2) is simply false – Polanyi recognizes the variety of ways science and 'non-science' can interact with each other. The boundaries between science and non-science are perfectly malleable for Polanyi.

Feyerabend's accusation of (1), on the other hand, is correct but in a more nuanced way than he suggests. Polanyi would reject Feyerabend's plea for democratic participation but would allow for 'outsider criticism.' To understand this, we need to appreciate that Polanyi contends, *pace* Feyerabend, that science should be *supervised*. He even claims that "Public supervisory powers are in fact the vital safeguards of independent forces of individual initiative in society" (Polanyi, 1946a, b/2017, 127). More specifically, he writes.

Supervision presupposes human activities which are initiated from a great multitude of centres, and it aims at regulating these manifold impulses in conformity with their inherent purpose. It achieves this by making generally available social machinery and other regulated opportunities for independent action, and by letting all the individual agents interact through a medium of freely circulating ideas and information (ibid).

This is in contrast to *planning* which involves a central authority that dictates, top-down, norms and priorities for institutionally, culturally, epistemically, and economically disparate centres of inquiry (see Mullins, 2003). Polanyi thinks that supervision is needed to facilitate a 'polycentric spontaneous order' wherein the creation of local inquiries creates specific demands for institutional networks to enable their expedition. Polanyi's approach is *bottom up*. His view on supervision is too complicated to elaborate in depth, but it is worth highlighting that Polanyi supports the 'social machinery' needed to circulate ideas – including criticisms of basic ideology. Polanyi is often wrongfully read as defending the view that scientists should incubate themselves from outside intellectual influences. This isn't right. Scientists are perfectly allowed to engage whatever intellectual enterprise they see fit. Whether it be politics, the arts, or cooking shows, scientists are allowed to engage with the 'outside' intellectual world.

Once we understand this, we can see the dimensions of critical discourse Polanyi celebrates and those he suspects. Critical interaction between agents, for Polanyi, should be between agents with the appropriate tacit knowledge. Scientists are free to criticize other scientists on whatever they see fit. But ‘criticisms’¹³ from outsiders are only *worth taking seriously* if scientists see some merit in them. If Trump criticizes anti-malarial research, his criticism only gets uptake if *practicing scientists see merit* in Trump’s claims. This transformation from criticism to a criticism worth considering is done by recognizing the ‘interest’ intrinsic to the finding and can connect it with existing bodies of scientific knowledge (Polanyi, 1940, 4–8). To do this, the inquirer requires familiarity with extant science and how outside knowledge may advance it. The outsider ‘criticism’ is only valuable if they can be attached to existing scientific knowledge.¹⁴ Thus the *source* of the criticism is from the outside, but it is only a *criticism* because scientists construct it as such. Outsiders can criticize all they want but for that criticism to genuinely contribute to the growth of science, it must be recognized as having some value and this can only be done by knowing the science. Since knowing is tacit, recognizing those criticisms that are worth taking seriously is within the purview of scientists even if the source of that criticism came from some crank.

This is insufficient for Feyerabend who is also interested in outside criticisms in the sense of non-scientists criticizing scientists on their own grounds, regardless of whether or not the scientists think those criticisms are worth entertaining.¹⁵ Critical discourse should not be constrained by scientists’ judgments – regardless of how prominent or well-entrenched they may be. Similar to Popper’s view in *The Open Society*, there is no “Great Man” [sic] who is to be protected from criticism (Popper, 1962, 273ff). If scientists tend away from pluralism, say because of scientific chauvinism,¹⁶ then they should be corrected. They may be forced to listen to outsiders even if they see no reason to do so. Feyerabend’s pluralism is *top down* whether scientists like it or not. His TCM case study is lurking in the background where progressive practices were resisted by scientists who had become beholden to scientific chauvinism. Moreover, the TCM case illuminates Feyerabend’s reasons for rejecting Polanyi’s argument from tacit knowledge. The scientists’ ‘tacit knowledge’ psychologically derived from scientific chauvinism which, upon reflection, is a bad argument. This was revealed through outside interference in science. This is in stark contrast to Polanyi’s view where, after a criticism of the basic ideology of science has been leveled, science “must then be defended on its true grounds. I suggest that for this purpose our beliefs, including our belief in science, will have to be declared

¹³ The same is true of discoveries in non-scientific fields. In order for the discovery to be *scientifically* important, it must be judged as such by scientists.

¹⁴ See Deichmann (2011, 254–6) for further discussion.

¹⁵ To be clear, Feyerabend also limits the participation of the cranks in critical dialogues (Shaw, 2017, 8–9; 2020b). Polanyi includes *all* outsider criticism deemed to be irrelevant by scientists as justifiably ignorable whereas Feyerabend delimits this to the criticisms of cranks which would also include cranks *within* the scientific community.

¹⁶ Note that even scientific chauvinism has its place in certain circumstances. For example, Feyerabend admits that at one point in history, scientific chauvinism was needed to overcome religious dogmatism (Feyerabend, 1975a, 4).

explicitly, in fiduciary terms” (Polanyi, 1952, 232). For Feyerabend, science is not intrinsically deserving of any trust and need not be reflexively defended from outsiders. It is only trustworthy *after* it has survived criticism.

We now have a more robust defense of democratic participation from the Polanyian objection that we should trust the tacit knowledge of scientists in guiding the critical paths science should take. Tacit knowledge, for Feyerabend, can only be deemed to be valuable from democratic participation and it cannot be used to delimit it. Despite Feyerabend’s misleading portrayal of Polanyi’s views, his TCM case analysis remains instructive for understanding why democratic participation should not be limited by appeals to tacit knowledge.

5 The freedom of science, science funding policy, and the NSF

As we have seen, Feyerabend thinks that the legitimacy of the freedom of science or democratic supervision is context dependent. Once this is understood, it is clear that Feyerabend should not adopt any stance, pro or con, on the freedom of science in particular cases. But Feyerabend was an adamant critic of the freedom of science without qualification and, therefore, seems to have ignored his own stance. This comes out most clearly when looking at his comments on the Bauman amendment and NSF. While the allocation of funds is only one way of directing scientific research from external interests, it remains deeply connected with debates about the freedom of science (see Tasker & Packham, 1990; Butos & McQuade, 2012; Butler & Mulgan, 2013).

5.1 Feyerabend and the Bauman amendment

The Bauman amendment, which was hotly debated just before the publication of *Science and a Free Society*, proposed to provide Congress with veto power over NSF budget proposals. Feyerabend praises this amendment as a move towards a socially responsible science:

Needless to say I welcome the Bauman amendment which recommends congressional veto power over the 14,000 odd grants the National Science Foundation awards every year. It is a very small step, but a step in the right direction. Scientists were upset when the amendment was passed by the house of representatives and the director of the National Academy spoke darkly of totalitarian tendencies. The well paid learned gentleman did not seem to realise that totalitarianism means direction of the many by the few while the Baumann amendment goes in the opposite direction: it suggests examining what the few are doing with the millions of public money that are put at their disposal in the hope that the public will eventually, profit from such generosity (Feyerabend, 1976, fn. 2 390).

Claiming that it is “needless to say” that the Baumann amendment is to be welcomed is an odd remark since the freedom of science is context sensitive. One would expect a detailed analysis of the amendment, the current place of the NSF in the

American science funding landscape, current infrastructure, and so forth. While it is possible that Feyerabend conducted this analysis and never published it, it is more likely that Feyerabend thought his appraisal followed straightforwardly from his animosity towards the freedom of science. While he recognized that his analysis is context sensitive, the only ‘context’ he considers is the prominence of scientific chauvinism and his contention that the American public is ‘mature’ enough to evaluate NSF budgets. This is a shallow analysis to say the least.¹⁷ He doesn’t consider norms of representative democracy in Congress, the pragmatics of reviewing over 14,000 grants by congressional sub-committees, how to develop metrics for social impact,¹⁸ procedural channels opened to special interest groups and their relationship to broader social concerns, existing institutional arrangements, the dynamics of the politicization of science (see Pielke, 2002), and so on and so forth. More upsettingly, Feyerabend doesn’t address the primary points of contention during the Congressional debates about the Bauman amendment – namely, issues of privacy, peer review, geographic distributions of funds, and power dynamics within scientific communities (Walsh, 1975). A brief discussion of the longer-term historical context the NSF was in in the 1970s will suggest that Feyerabend’s social commentary may have been ultimately backwards.

The formation of the NSF in the late 1940s and 1950s was motivated, though not entirely, by the views of Vannevar Bush.¹⁹ Bush also, famously, notes the unpredictable growth of science and its possible applications:

Discoveries pertinent to medical progress have often come from remote and unexpected sources, and it is certain that this will be true in the future. It is wholly probable that progress in the treatment of cardiovascular disease, renal disease, cancer, and similar refractory diseases will be made as the result of fundamental discoveries in subjects unrelated to those diseases, and perhaps entirely unexpected by the investigator... Progress in the war against disease resides from discoveries in remote and unexpected fields of medicine and the underlying sciences (Bush, 1945, 14).

But Bush does not ground his argument for the freedom of science on this view of progress. Rather, *The Endless Frontier* is best read as a multi-faceted analysis of the post-War American federal context. As Nathan Reingold summarizes, “Vannevar Bush was a creative anachronism, someone with many viewpoints... who attempted to adapt his viewpoints to the exigencies of the moment and the perceived shape of the future” (Reingold, 1987, 300). Like Feyerabend, Bush restricts the freedom of science to the (would-be) NSF and specifically limits the scope of

¹⁷ Even his analysis of these phenomena is fairly superficial. His examples of ‘mature citizens’ are from various periods of history, cultures, and institutional contexts and provides no reason to think that mature citizens can be reliably distinguished from immature citizens or that they are a sufficient majority. The same is true for his discussion of scientific chauvinism, of which he makes similarly sweeping statements. Indeed, one of William Proxmire’s critics, anthropologist Sherry Ortner, accused Proxmire of downright ignorance in his condemnation of her project’s relation to foreign policy (see Solovey, 2020, 150–152).

¹⁸ See Holbrook (2005) for discussion of some of the issues with social impact metric developed in the 1990s.

¹⁹ For broader discussions, see Hollinger (1990) and Cohen-Cole (2014).

the NSF to basic research (which is similar to, though not identical with, luxury research). Like Polanyi, this is not because basic research is intrinsically important but, more modestly, because it is a social good.²⁰ Basic research had little support at the time and was needed since industry demands surpassed what extant knowledge could fulfill (Bush, 1945, 7) and the unreliability of European scientific institutions due to the destruction from the war (19). Basic research should be free not merely because its benefits are unpredictable, but because it requires *long-term support*. The stability of long-term funding is possible in peace times (i.e., not during war when priorities must be shifted to applications) and only through governmental agencies since private industry lacks the proper incentive structure to continually support basic research (9–11).²¹ Additionally, basic research is best practiced in universities (7), which have long-standing legal relationships with the federal government that prohibit heavy state interference. Moreover, Bush argues that since basic research “is certain to arouse opposition because of its tendency to challenge current beliefs or practice” (19) it needs to persist under changes of political regimes. This anticipates the argument presented in Wilholt (2006); longitudinal research programs require stability across changes of political powers and commercial interests that demand “immediate results... [in the] short-term” (Bush, 1945, 33). This cannot be provided if every political authority or lobby group can change scientific research in accordance with their immediate interests. Thus Bush’s argument for freedom of science is deeply sensitive to the particular institutional needs of basic science and how these institutional needs relate to existing legal and social frameworks.

While Feyerabend may have disagreed with Bush’s assessment, he would not disagree with his *approach*. The freedom of science, for Bush, is justified by a multifaceted analysis of his surrounding context.²² The context changed by the 1970s making it reasonable to re-raise questions concerning oversight of the NSF. But the motivations of the Bauman amendment are multifarious and not all of them line up with Feyerabend’s views (see Solovey, 2020, Chapter 5). An importance science policy figure at the time, Senator William Proxmire (D-Wisconsin) was motivated by the NSF’s support of seemingly frivolous projects. Proxmire initiated the publicly popular ‘Golden Fleece Awards’ which he presented to projects that he found to be especially ridiculous. In April 1975, the award went to a study of why humans, rats, and monkeys clench their jaws in moments of stress. Proxmire famously quipped that “The funding of this nonsense makes me almost angry enough to scream and kick or even clench my jaw... The good doctor has made a fortune from his monkeys and in the process made a monkey out of the American taxpayer” (quoted in Baldwin, 2018, 552). This motivation seems to be in keeping with Feyerabend’s wishes

²⁰ Bush argues separate governmental agencies should be created for “military problems, agriculture, housing, public health, certain medical, research, and research involving expensive capital facilities” (Bush, 1945, 12) and states that creating state-supported research clinics for translating basic to applied research is “worthy of further study” (21).

²¹ This contention was strengthened in the 1950s and 60 s due to developments in theoretical economics where market failures will arise in private investments in knowledge production.

²² See Greenhill (2000) for discussion of the postwar political climate and the reception and influence of Bush’s views.

to see science funding publicly important projects.²³ But Robert Bauman (R-Maryland) had other motivations which were (possibly) more nefarious. He wanted to see increased concentration of funds in the natural sciences over the behavioural sciences which was a common move by Republicans who worried that the social sciences were pseudo-scientific promoters for progressive values (see Solovey, 2013). This is an attempt to censor research and certainly not on democratic or pluralistic grounds. Given that the Bauman amendment didn't pass the Senate, it is difficult to assess how its implementation would have affected funding priorities. But many federal interventions in science since the 1970s, including attempted bans on research on stem cells, climate change, and firearm regulation and meteoric rises in pork barrels²⁴ should make us wary that federal government interventions, at least in the United States, will be genuinely democratic and respect pluralism.²⁵ More concretely, Proxmire's ideas influenced conservative commentators and policy makers, who proliferated during the Reagan presidency, who tried to censor research on taboo subjects such as gender norms and sexuality (cf. Solovey, 2020, 153–4). More successful movements in democratizing science have not come from federal budget reviews or centralized mandates²⁶ but from public pressure influencing the culture of particular scientific communities (Epstein, 1996), local forums for public participation (Futrell, 2003; Sismondo, 2008, 18–19), and direct public engagement on well-specified topics (Durán & Pirtle, 2020). This suggests that the Bauman amendment was not a good way to involve citizens in science. While this is somewhat speculative, a closer look at the Bauman amendment its potential implications for future interventions in scientific research priorities as well as the specific role of the NSF within the federal science policy system should have changed (or at least complicated) Feyerabend's assessment of it.

5.2 Lessons from Feyerabend's assessment of the Bauman amendment

The shallowness of Feyerabend's social commentary reveals a common tendency that he berated: applying highly abstract arguments to concrete situations without considering the details of the particular case. Indeed, the devil is often in the details entailing that a deep analysis may reveal that Feyerabend's argument for the

²³ Proxmire's arguments, though, should not immediately impress Feyerabend since they are grounded in *his* judgments of value and the *assumption* that his judgments are widely shared. The popularity of the Golden Fleece awards provides some indirect evidence that Proxmire's judgments are representative of the public, but the public was only exposed to a one-sided argument and so this constitutes weak evidence, at best, that the NSF was funding 'frivolous projects' (from a democratic perspective).

²⁴ See Martino (1992). A part of this problem stems from the fact that issues concerning priorities rarely gain sufficient public attention to pressure publicly elected officials to represent the views of the general public. This makes intervention at the level of budget reviews more likely to happen on behalf of powerful special interest groups.

²⁵ See Jasanoff (2011, 58ff) for a discussion of similar movements in Germany after WWII.

²⁶ A possible exception to this can be found in national public health consensus conferences in Denmark (Scløve, 2000). But this seems like an importantly different context given that Denmark has a significantly smaller population and is more culturally homogenous.

Bauman amendment may be counterproductive to its own goals. A similar complaint has been made by Mark Brown in his review of Kitcher's *Science, Truth, and Democracy*:

Kitcher's deferral to social scientists is simply the flip side of his disinterest in adapting philosophical ideals to social scientific knowledge. There is nothing wrong with an academic division of labour in which philosophers focus on issues of justification, for example, and social scientists, on questions of institutional design. But the division of labour works best when it is undertaken cooperatively, in such a way that practitioners in different disciplines can make use of each other's work. Philosophers who fail to give consideration to institutional questions risk developing theories that obscure rather than illuminate the problems of social science (Brown, 2004, 94).

Applying this to Feyerabend, his silence on many of the other dimensions of science funding policy as manifested in particular historical, institutional, and intellectual contexts risks developing a conception of the freedom of science that obscures issues more than it aids them. It also highlights Feyerabend's 'disinterest' in adapting his philosophical ideals into practice despite the fact that that was *precisely* his intent: "My main motive in writing [*Against Method*] was humanitarian, not intellectual. I wanted to support people, not to 'advance knowledge'" (Feyerabend, 1993, 3). In this way, Feyerabend's work was constrained in the kind of analysis he saw as necessary due to widely accepted norms of what constituted 'philosophy.' While this seems obvious, it is a mistake philosophers and social commentators, Feyerabend included, often make: practical advice cannot come from highly abstract reflections about the nature of science and its place in society alone. Philosophical proclamations about the place of science in society depend on (often) *hidden empirical premises* that must be evaluated using detailed studies of particular contexts. Feyerabend's mistake, then, provides a lesson for all of us – a lesson some are still struggling to learn (see Fehr & Plaisance, 2010). Indeed, too many papers and books speak about 'the' freedom of science as if this was a tangible viewpoint one could reasonably hold.

If we take this point seriously, then it has implications for how we should think about Feyerabend's use of the case study of TMC. Feyerabend never discusses, methodologically, what he takes himself to be doing.²⁷ Feyerabend could be read as *distilling* lessons for the freedom of science from this case study.²⁸ But if this is the strategy, then Feyerabend is losing the details of the case which are *necessary* to make judgments about the freedom of science viable (in a specific context) in the first place. Feyerabend must only distill away the details he thinks are irrelevant to extracting a general argument – but no such analysis is given.²⁹ Another strategy may be that he is using this case study as *evidence* for more general claims about the freedom of science. But this strategy fails in a similar fashion. We can only

²⁷ The literature on the use of case studies is vast and I do not have the space to engage with it here. See Chang (2011) and the award-winning Bolinska and Martin (2020) for starters.

²⁸ This strategy is adopted by Wilholt and Glimell (2011, 351).

²⁹ Again, this is a limitation imposed by the structure of *Against Method*. Feyerabend provides dozens of case studies in this text, but only goes into one in depth.

generalize towards groups of similar cases, meaning that an analysis of the details of the relevant similarities is necessary for such a generalization. Another possible reading is that Feyerabend may be read as providing an *illustration* of his general *ideal* of pluralism and how democratic supervision may facilitate this ideal. If this is the case, then his ideal stands or falls with his arguments for pluralism and democracy; not from the TCM case. Finally, and probably most fruitfully, Feyerabend could be read as merely providing a starting point for a more nuanced discussion of the debate about the freedom of science. This seems like a plausible reading given Feyerabend's frustration with the hasty generalizations his colleagues drew from the Lysenko affair – he simply wanted to counterbalance the conversation and his rhetorical strategy for doing so required providing a case study. If this is right, then Feyerabend is not genuinely giving an argument for democratic participation but merely trying to change the direction of a one-sided debate. From this, we can conclude that Feyerabend's case study is incomplete and the further details that would need to be elaborated depend on his methodological background contentions.

6 Concluding remarks

The freedom of science was hardly a side-issue for Feyerabend, at least from the late 1970s onwards. He even suggests that his criticism of the freedom of science was the primary purpose of *Against Method*: “The point of *Against Method* was that those who want to turn a narrow scientific philosophy into a public malaise without any supervision by the public have not a leg to stand on” (Feyerabend, 1978a, 185). While this may be an overstatement, it certainly remains essential to understand his position on this matter to understand his broader views on science and democracy. However, as we have seen, Feyerabend's discussions are filled with unnoticed tensions, unclear background assumptions, and disconnects between his philosophical outlook and his social commentary. In spite of all of this, though, Feyerabend's discussions provide a useful stimulus for how we may think about the freedom of science debate. Indeed, Feyerabend's works can be seen as a microcosm of debates on the freedom of science and the tensions contained therein are ones that are often struggled with.³⁰ After all, the freedom of science is a multifarious affair and there are a wide variety of political, social, financial, and methodological considerations that push and pull in various directions (see Jasanoff, 2005; Wilholt, 2006; Wilholt & Glimell, 2011). This complexity is one Feyerabend pointed to and struggled with in his own thought.

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³⁰ The recent departure of Mauro Ferrari from the European Research Council is a case in point, wherein the ERC is designated as a ‘basic research institution’ which Ferrari wished to transform into a “front lines” institution funding research directly related to the COVID-19 pandemic. The public dispute between Ferrari and the ERC mirrors many of the internal disputes within Feyerabend's corpus (see Hudson, 2020).

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