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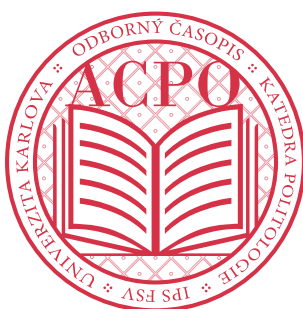
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## A Dialogue between Republicanism and the ‘Republic of Science’

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### **Abstract:**

*In the present article, we argue that there can indeed be a dialogue between the political and philosophical theory of republicanism and between the philosophy of science. We argue that although there exists an apparent conceptual and historical gap between the philosophy of science and theories of republicanism, that gap can be breached, we argue through an attention to conceptions of elitism in republicanism, focusing on the work of Madison and Jean-Jacques Rousseau. We also contend, though in a preliminary, often provocative way, that the issue of elitism in republican theory can benefit from a dialogue with the philosophy of science—especially the “negative epistemology” of Karl Popper and his students, Ian Jarvie and Joseph Agassi. Such a dialogue is possible because Popper’s philosophy proposes a solution to the problem of elitism in epistemology and in politics.*

**Key Words:** *Karl Popper; James Madison; Jean-Jacques Rousseau; Joseph Agassi; Ian Jarvie; Robert Merton; Michael Polanyi; Thomas Kuhn; republicanism; ‘republic of science’*

### **Introduction**

It would be indeed very difficult to find a more nuanced or ambiguous intellectual tradition than republicanism. There is no room in this article to refer to extensive discussions on this issue on which—as may be added—agreement seems rather very unlikely. Looking, however, for some common denominator or the least questionable starting points, one may suggest that republicanism concerns placing power into the hands of citizens and, arguably, promoting civic virtue among the latter. Within this framework, politics should be both popular and virtuous, requiring a more responsible approach of the citizenry, as long as they are the real source of sovereignty.

Starting from this assumption, it can be proposed that there will be an unavoidable tension in republicanism—one between, to use modern terms, participatory and elitist elements. If such is the case, perhaps the most valid dilemma within republicanism can be boiled down to the question of elitism: to what extent it can be accepted without contradicting the very popular basis of politics. Such intuition can be at least justified while reading profound republican theorists of the 18<sup>th</sup> century such as Jean-Jacques Rousseau and James Madison.

Representing different philosophical stances, they still had much in common, especially in that they both wanted to derive all their institutional provisions from the assumption of the people as the only appropriate and necessary source of sovereignty while

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still strongly sticking to the idea that politics, being primarily and ultimately about public good, is a matter of virtue.

And what is of special interest to us is that in developing their theories of republicanism throughout their lives, they equilibrated, very significantly, between their strong beliefs in the possibilities of a more participatory engagement of the common citizenry and some recognition of the need for a more responsible, if not elitist, politics. Our main aim in this essay is to present how thus understood dilemmas of republicanism may correspond with those of science and the philosophy of science.

Thus, after analysing the thought of Rousseau and Madison that best mirrors the indicated dilemmas, in the second section of this article we consider the problem of elitism in science and in politics. We do this in order to advance the philosophical consideration of republicanism into another realm. This underscores that the conceptual difficulties in republicanism that have been outlined in the introduction need not be resolved in order for republicanism to address fundamental questions. Accordingly, we contend that the problems of elitism in science and in politics are similar enough that discussions of proper social organization in science will lead to the resolution of problems in politics. We underscore further that, in both science and in politics, elitism remains not only a fundamental problem for republicanism, but a critical issue for the philosophy of science.

Thus, if the two key discussants of our paper on republicanism are Rousseau and Madison, who, as we will show, propose resolutions of the problem of republicanism that need deep interpretation, an additional two authors (Robert Merton and Michael Polanyi) represent a failure to address the problem of elitism in the philosophy of science. Furthermore, we contend that the philosopher of science Karl Popper and in particular the critiques and extension of the philosophy of Popper put forward by Joseph Agassi and Ian Jarvie pose a solution to the problem of elitism in science and in politics. This solution, simply outlined, underscores that epistemology is a *via negativa*. It is the conviction that one is most likely wrong and that the only potential, partial solution is the correction of that error.

If one is most likely wrong, Agassi and Jarvie underscore, the only credible solution to the problem is a broadly democratic one. This is due to the fact that for there to be a correction of error, another must first point out the error. Error correction is essentially democratic in that it becomes more and more possible as more and more are able to correct the error. We argue then that error correction and political governance have the same problem, that of elites, but that Popper (and Agassi and Jarvie's philosophy of science) poses a solution to the problem of elitism in both science and politics.

We understand, finally, that the unity of politics and science will engender resistance. Political theory underscores that the end of politics is the public good and that the end of science is the approximation of the truth. We argue, however, that the end of politics must also be truth, as that is perhaps the greatest of public goods.

## The participatory and elitist elements in Rousseau's and Madison's thought

We shall show in this section how in both authors' approaches<sup>2</sup>, beginning with Rousseau, the participatory and elitist elements were necessarily combined, and how they approach

<sup>2</sup> Some of Rafał Lis' arguments, concerning especially Rousseau, he has already made or approached in some of his Polish articles (see e.g. Lis 2016, Lis 2017). However, in analysing the latter's thought, in this paper we argue he puts far more emphasis on its elitist elements.

the problem of “*better*” politics. To begin with, Rousseau is often perceived as among the most profound proponents of popular sovereignty, intertwining the tradition of republicanism with the doctrine of a social contract. Arguing categorically for the indivisibility of the general will, which—belonging necessarily to the people—manifested the latter’s exclusive legislative power, he said that “*in any case, a people is always in a position to change its laws, however good; for, if it chooses to do itself harm, who can have a right to stop it?*” (Rousseau 1923: 47).

Admittedly, it would be difficult to find in the literature of the 18<sup>th</sup> century a stronger argument for endowing the people with the right of law-making. Moreover, Rousseau seems ready to see it as an unlimited right, allowing the people to pass any laws they like, including erroneous ones.

However, somewhat contrary to similar assessments, Rousseau is often seen as a critic of a more participatory politics, and—to complicate things even further—part of the reason for that may be his readiness to recognize the cognitive weaknesses of the masses. Perhaps the most critical in that respect are the following statements from his *Social Contract*: “*How can a blind multitude, which often does not know what it wills, because it rarely knows what is good for it, carry out for itself so great and difficult an enterprise as a system of legislation?*” (Rousseau 1923: 34).<sup>3</sup>

Yet, since this suggestion was uttered in more hypothetical considerations about the nature of a political society, one should be careful not to distort its meaning. But the controversy is still there. Nowhere is Rousseau’s criticism of the rule of a “*blind multitude*” better seen than in his rejection of democracy per se and—for that matter—his preference of, as he put it, an “*elective aristocracy*.” But one should not go too far in ascribing him that rejection. Above all, one should remember the reasons for which Rousseau criticizes democracy. It was due to its erroneous unification of the legislative with the executive and—because of that—its tendency to blend the general with the particular wills. But in arguing for such separation, justifying the establishment of an independent and professional executive, Rousseau was by no means willing to undermine his insistence on endowing the people with the ultimate and exclusive legislative power and the very power of controlling the executive.<sup>4</sup>

Whatever the logical (and constitutional) consequences of such considerations, the possible tension between the participatory elements and those pertaining to the public good in Rousseau’s thought may be ultimately explained by referring to his more philosophical assumptions concerning the general will. In this respect, there is one characteristic of particular importance. It is Rousseau’s observation that instead of transmitting the general will, the will of the majority can sometimes be “*no more than a sum of particular wills*” (Rousseau 1923: 25).

However, even if Rousseau is highly critical of wrong laws passed by a corrupted or otherwise misled majority, he still does not recommend any mechanism of correction from above because—again—every law, whatever its merits, must be supported by a majority. Besides, there is still more evidence that Rousseau strongly believed in the political (and

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<sup>3</sup> This leads him to the following conclusion: “*All stand equally in need of guidance. The former [the individuals] must be compelled to bring their wills into conformity with their reason; the latter [the public] must be taught to know what it wills. If that is done, public enlightenment leads to the union of understanding and will in the social body: the parts are made to work exactly together, and the whole is raised to its higher power*” (Rousseau 1923: 34).

<sup>4</sup> For a further explanation of these issues, see especially Miller (1984: 105 ff.) and Putterman (2010, 27–29).

intellectual) capacities of the common people, expected to fully participate in the matters of a republic. More positively, the very participation of the people in the matters of a republic could be an indication that those matters have gone in the right direction. Nowhere is that truth better expressed than in his famous criticism of the idea of representation, when he observes that:

*“In a well-ordered city, every man flies to the assemblies: under a bad government, no one cares to stir a step to get to them, because no one is interested in what happens there, because it is foreseen that the general will will not prevail, and lastly because domestic cares are all-absorbing”* (Rousseau 1923: 83–84).

All that has been said thus far is very indicative of how an ideal republic should function. Although it is applicable almost exclusively to small states, which can do without the institution of representatives, one can expect the commented relationship between the whole body of citizens and their functionaries somewhat affects republican constitutionalism as such. For further suggestions one should turn in this respect to his *Considerations on the Government of Poland*, which in itself manifests that Rousseau was perfectly ready to accept the necessity of a sort of delegation of power in large countries.<sup>5</sup> Fortunately enough, in reforming their republic the Poles could rely in this respect on their old institutions of *dietines* (*sejmiki*), issuing their deputies with mandatory instructions. Due to the latter, Rousseau asserts,

*“The deputy, every time he opens his mouth in the Diet, every time he takes any action there of any kind, must see himself on the carpet before his constituents (...). In a word, the nation does not send deputies to the Diet to give voice to their own sentiments but to declare the nation’s own will (...)”* (Rousseau 1985: 37).

As we can conclude, the election of deputies would not necessarily undermine, so to speak, the participatory inclination of Rousseau’s republicanism. However, there is yet another element in his *Considerations* that can add up to the commented interlink between popular and elitist dimensions of Rousseau’s thought. I have in mind the idea of a *“step-by-step promotion for all members of the government”* that he outlined in further sections of his work (Rousseau 1985: 89–100). But even if this conception entailed the division of the whole active citizenry into three hierarchical classes of promotion, Rousseau was not swinging towards pure elitism. He avoided this danger by basing the institution of promotion on the mechanism of public evaluation, determining in his project the prospects of a civic (that is political but also teaching) career.<sup>6</sup> So, despite some apparently elitist or hierarchical

<sup>5</sup> See especially Derathé, 1970; Baker, 1988.

<sup>6</sup> For instance, one could become the candidate for a deputy only after having been previously classified to the first grade, and further, to pass to the second grade, one was required to have served as a deputy for three terms, each time being positively evaluated after the end of such term in the *dietine*.

characteristics of Rousseau's system of promotion, *it was entirely based on the strong assumption of a broader engagement of the common citizenry*. In this way, to anticipate our argumentation, Rousseau's account can be viewed as a kind of model for error correction. Above all, his intent was to reinvigorate the commitment of the citizenry and their attachment to the public good, serving the purpose of rendering the patriotic virtues the true objects of civic emulation.<sup>7</sup> As such, it was part of a broader republican mechanism of civic education, permeating, ideally, the whole nation.

Let us turn now to James Madison. To begin with, Madison is counted among the most influential proponents of the American Constitution of 1787, which carried—or rather with its justification, best outlined in the *Federalist Papers*—a new understanding of republicanism. At its centre was an attempt to capture the danger of factionalism, so powerfully presented in *Federalist 10*. Madison was especially afraid of “*men of factious tempers, of local prejudices, or of sinister designs*” who—as he continued—“*may by intrigue, by corruption or by other means, first obtain the suffrages, and then betray the interests of the people*” (Cooke 1982: 62).

But as he believed an “*extensive republic*” should bring a solution to that problem, simply by providing—due to its larger electoral districts—an opportunity to select “*proper guardians of the public weal*” (Cooke 1982: 62). As it is well known, Madison assumed that only the enlargement of the sphere of political activity can neutralise the bad effects of factional interests, so strongly associated by him with their predominantly local inclinations. In other words, merely making elections less local will render factionalism less visible.

However, in Madison's eyes, all this had no less to do with sort of filtering the will of the people so that only the members of enlightened elite could have a chance of being elected. After all,

*“as each Representative will be chosen by a greater number of citizens in the large than in the small Republic, it will be more difficult for unworthy candidates to practise with success the vicious arts, by which elections are too often carried; and the suffrages of the People being more free, will be more likely to centre in men who possess the most attractive merit, and the most diffusive and established characters”* (Cooke 1982: 63).

While similar assertions may prove Madison's scepticism about the natural capacities of humans as such, and with it his elitist inclination so convincingly depicted in the literature,<sup>8</sup> one should be careful not to exaggerate this argument. Nonetheless, Madison declared himself a republican and categorically considered the people the only legitimate and ultimate source of sovereignty, which by definition excluded any other claims of political power (especially *Federalist 39* and *46*). Obviously, in justifying the new plan of government, he went beyond many republican beliefs, which did not escape the attention of his anti-federalist opponents. Perhaps one should agree with Terence Ball's conclusion that “*Publius*” rather failed to answer, “*the Antifederalist charge that the new Constitution would exacerbate and intensify these feelings of civic incompetence and would lead inevitably to popular apathy,*

<sup>7</sup> See e.g. Hont, 2015, 120–1.

<sup>8</sup> For a similar approach, see e.g. Morgan (1988: 267).

*political corruption, and the loss of civic virtue*" (Cooke 1982: 150). Nevertheless, there is much evidence to support the belief that such elitist ramifications were rather not Madison's intention. Even if it is difficult to entirely disagree with Ball that according to Publius it was the "system", not the people themselves, that was to be virtuous (Cooke 1982: 154), one can still emphasize Madison's later assumptions, revealed in *Federalist 46*, of a more vigilant role of the people, operating—if necessary—on the state level, always ready at any rate to act when alarmed by "*ambitious encroachments of the Federal Government on the authority of the State governments*" (Cooke 1982: 320).<sup>9</sup>

One can easily find that a similar conjunction of arguments for a more active role of both the people themselves and the states, already outlined in *Federalist 46*, was precisely what Madison was to strongly reaffirm in the following decade, when he became one of the major critics, together with more radical Jefferson, of Hamilton's centralist inclinations, best represented by the proposed Alien and Sedition Acts, 1798.<sup>10</sup> What we can at least conclude from Madison's *Report of 1800*, in which he defended one of the two documents ratified by the dissenting state assemblies, namely the Virginia Resolutions, 1798, the criticised acts were dangerous precisely because of their supposedly pernicious effect on the sphere of public opinion and free speech as its most important requisite. Madison simply kept explaining that the communication among the people should not by any means be limited because it was the cornerstone of a free and republican government, facilitating and enabling the very mechanism of accountability of those in power, being merely the agents of the people. In other words, in Madison's view, the commented act posed a lethal threat to republicanism. Characterized this way, it must necessarily alarm the people, who, acting within their constitutional and sovereign power, were perfectly empowered to repel any abuses of power. As we can read in his *Report*,

*"It cannot be forgotten, that among the arguments addressed to those, who apprehended danger to liberty, from the establishment of the general government over so great a country; the appeal was emphatically made to the intermediate existence of the state governments, between the people and that government, to the vigilance with which they would descry the first symptoms of usurpation, and to the promptitude with which they would sound the alarm to the public"* (Madison 1800).

In any case, what is of special importance to us is that in justifying similar rights of the states Madison revealed his most categorical belief in the political capacities of the people *per se*. After all, a vigilant nation did not cease to be one of the most important preconditions of a republic. However, he wanted to associate such vigilance with the development of public debate and more enlightened public attitudes of its core engaged participants. So, in emphasising Madison's belief in the people, one should remember that—as Saul Cornell and Colleen Sheehan argue—his main intent was to put republican government on a stronger foundation of public opinion (Sheehan 2012)—being always in the position to educate itself (Cornell 1999: 248). To that aim, both commentators turn their attention to his earlier

<sup>9</sup> See especially Kramer (2004: 48)

<sup>10</sup> See especially Sheehan, 2012.

essays from the *National Gazette*. Among the most important of these were especially the two essays 'Consolidation' and 'Charters', edited on 5 December 1791 and 18 January 1792, respectively. Interestingly, in the first essay, he commented on the opposition between the advocates of the states and those of American unity in the following way:

*"Let the former continue to watch against every encroachment, which might lead to a gradual consolidation of the states into one government. Let the latter employ their utmost zeal, by eradicating local prejudices and mistaken rivalry, to consolidate the affairs of the states into one harmonious interest; and let it be the patriotic study of all, to maintain the various authorities established by our complicated system, each in its respective constitutional sphere; and to erect over the whole, one paramount Empire of reason, benevolence and brotherly affection"* (Madison 1791).

Equally indicating in this respect were his statements in the second essay, in which he argued that given that *"all power has been traced up to opinion"*,

*"how devoutly is it to be wished, then, that the public opinion of the United States should be enlightened; that it should attach itself to their governments as delineated in the great charters, derived not from the usurped power of kings, but from the legitimate authority of the people (...)"* (Madison 1792).

As Colleen Sheehan has shown (2015: 78), there is much evidence in Madison's works, including especially *Notes on [Federal] Government* (1789), to suggest he was much more absorbed in similar considerations. Especially important in this respect is his assertion that a well-functioning republic still needs the *"class of literati"* because, as he put it,

*"They are cultivators of the human mind—the manufacturers of useful knowledge—the agents of the commerce of ideas—the censors of public manners—the teachers of the arts of life and the means of happiness"* (Sheehan 2015: 165).

Did it indicate a more elitist inclination? Here again the answer should be most presumably negative. As the mentioned commentator convinces us, shifting her attention to another essay in the *National Gazette*, 'Public Opinion', Madison's account of literati was only part of a broader ideal of a republic built on the free communication of ideas, permeating and attaching to itself larger ranks of society. Understood this way, it was no less important that the very mechanism of representation. As we can read in this paper,



*“Whatever facilitates a general intercourse of sentiments, as good roads, domestic commerce, a free speech, and particularly a circulation of newspapers through the entire body of the people, and Representatives going from, and returning among every part of them, is equivalent to a contraction of territorial limits, and is favorable to liberty, where these may be too extensive”* (Sheehan 2015: 245).

It should be admitted that Rousseau and Madison offered very different solutions to the republican dilemmas of their times. One may argue that Madison makes republicanism more applicable to modern, extensive states and perhaps all this was possible due to his more moderate assumptions regarding the virtue, or perhaps even the capacities, of the common citizenry. Yet, he still relies on the mechanisms of rule by majority and, arguably, the latter’s capability to discern public good. Even if he sort of shifts the responsibility for virtuous politics—as, again, Terence Ball wants it—from the people to the system, one can still argue that the very assumption that elections in larger districts will naturally lead to the selection of virtuous candidates presupposes, no matter how artificial the system seemed to be, some competence of the electorate to prefer virtue over vice. In his later essays, Madison seemed to go even further, believing that the republic, based ultimately on public opinion, should aspire not only to be the best safeguard of liberty but also the embodiment of reason and virtue.

Rousseau seems to overtly assume that without a virtuous citizenry the fate of a republic must be doomed from the outset. Albeit his approach can be seen as more idealistic (or over-demanding), he managed to present—in his *Poland*—a more detailed mechanism of gradual promotion of public functionaries in a large country without recourse to the strictly understood system of representation.

On the whole, both authors’ conceptions offered a considerably wide range of suggestions on how to inspire modern republicanism, understood ultimately as a government based on the popular will and opinion. From what has been said, it is clear both understood the need for the republican elite and its role in promoting the public good and, arguably, patterns of behaviour but, while doing so, managed to avoid slipping into elitism. In their view, the elite is recruited from the nation and albeit it may even—especially in Madison’s account—shoulder much of the responsibility for the decision-making, it remains almost entirely under the control of the nation.

All this should rather lead us to the recognition that politics is a process of constant improvement aiming at the good of the republic, depending necessarily on the due relationship between the nation and its elite. But more critically, and by way of anticipating what will be discussed in the next section of the article, we will rather not find in their works more positive answers as to how to arrange a similar mechanism. They kind of assume that decisions have to be taken by majorities and all one can hope for is that either it will happen to be right (assumedly, to what the elite must or could have contributed), or—what can be added with regard to the authors of the *Federalist*, as Bernard Manin (1994) has aptly concluded—the ill-intended or perhaps misled majority could be still successfully countered by the constitutional checks and balances. Yet, the contemporary reader may duly ask: how to advance in this process? and especially how to choose between two or more competing options claiming to represent the good of the people and, not need to mention, perhaps supported by different segments of the elite?

Again, both authors perfectly understood that the majority may simply be wrong or otherwise misled by demagogues. Precisely for that reason, they searched for better mechanisms of the decision-making and the recruitment of the republican elite. However, considering the republic as the only legitimate form of government and warning against corruption, they seemed to leave aside the whole issue to the virtue of future generations. Either they will prove worthy of their liberty and keep their republic or cease to deserve it, and simply lose it.

To sum up the first part of our article, republicanism, with its emphasis on the good (and perhaps more provocatively, the error-correcting ability) of the whole citizenry, appears to be poised between its participatory and—within its due confines—elitist elements. And this analysis leads us in the end to the suggestion that republicanism suffers from not responding to the problem of how to assert a constant betterment of the republican politics.

It is true, however, that the aforementioned questions can be easily uttered with the benefit of hindsight—given especially what we know from the experiences of so-called party democracy. And perhaps only in its criticism can one look for more “*political*” answers to them. Instead, we propose quickly shifting attention to a very different area of theorizing—that of the philosophy of science. Albeit at first glance the “*republic of science*” may seem too remote an area to suggest solutions to the dilemmas of republicanism in its strict, political sense, we will show that one can still find in it some promising analogies and, perhaps, recommendations. More precisely, we will demonstrate that while revealing ultimately analogous tensions between the elitist and participatory elements, it can deliver interesting propositions of how to inspire politics with the ideals of self-correction and improvement. As the above analysis has rather indicated—particularly in the case of Rousseau’s understanding of the need for a broad engagement of the populace in politics and Madison’s emphasis on the virtues of enlightened public opinion—republican theory and discussions of republicanism underscore that governments need error correction and that the public is the essential component to that error correction. As importantly, error correction leads to the education of the citizenry, of the principle issues regarding the populace in republican theory.

The perceived difference is this: political theorists do not think tyranny an issue of truth, but rather one of virtue and corruption. But tyrannies are impossible, we assume, when they are subjected to the truth; in contrast, dictatorships often lie. Thus, good government and good science have the same dynamic: error correction leads to both good government and good science. Thus, while recognizing the obvious differences between politics and science, we still want to consider their somehow overlapping fields—those of the republic per se and, very indicatively, the “*republic of science*”.

### **“The Republic of Science” and the Philosophy of Science**

To begin, we underscore that if there is a spectre haunting the philosophy of science, it is the spectre of the public and its ability to engage in scientific dialogue and in discussion. As importantly, we underscore that in contemporary philosophy of science, discussions of the participation of the public in science are, in actuality, discussions of the best form of government. For it was the opinion of 20<sup>th</sup> century philosophers of sciences, even those who had elitist tendencies, that science was impossible under authoritarianism.

Philosophers of science have continually wished to establish a space for the public, consistent with the democratization of social and scientific institutions in the United States

after the Second World War. But philosophers of science and the philosophy of science have not been able to fully follow through with the convictions, and generally have sided with elitism, particularly Thomas Kuhn and also, begrudgingly and in the last analysis, Michael Polanyi, whose contribution to the philosophy of science is now mostly bound up with the idea of *"tacit knowledge"*, first articulated in the 1960s (Polanyi 1966).

With Polanyi, in particular, this is a great unresolved tension. Joseph Agassi, the Israeli philosopher of science and student of Karl Popper, remarked on this when he noted that Polanyi *"has not given up the idea of democracy. He admits the leader may be in error."* He admits too that *"the community"* is often suspicious of its scientific elites, thereby making *"elites"* more open to criticism by the community. However, Agassi, correctly, underscores that both Kuhn and Polanyi at the very most accord the community a role to the *"rank and file"* of *"normal science."* For most philosophers of science, then, the lot of the community, if they have any role in science at all, is one of boredom. It is the elites who are responsible for *"genius"*, and in the work of both Kuhn and Polanyi it is the *"genius"* who is really responsible for science. Agassi calls this the *"Kuhn-Polanyi authoritarian view of science"* (Agassi 2012). Ian Jarvie, a frequent co-author of Agassi and a student of Popper himself, called Polanyi's view of science a *"republic"* where *"leading scientists or 'masters' lord it over the rest"* (Jarvie 2001). Jarvie points out, quite damagingly, that this authoritarian account of science, in which masters 'lord' over the populace, makes progress impossible. This is due to self-regulating governance by an elite being necessarily a defence of the status quo.

Robert Merton goes further in his sociology of science, noting that science was constituted to identify elites and to increase their numbers. This is what Merton understood when he described the *"Matthew Effect"*, which showed how elites develop in science; indeed, how they must develop (Merton 1968). This is more than a defence of the status quo; this is rather the idea that elites not only should govern science, but that science, in increasing the numbers of elites, actively promotes the progress of science.

The scenario for Merton is the following: if a scientist is successful, the institution where he undertakes his scientific research rewards that success by granting him more resources. This means more funding, laboratory space and personnel. This is a significant move for a scientific institution, as it demonstrates that scientific institutions are rational (or that they wish to appear to rationally balance risks and interests). They are rational because they are deciding on how to sensibly govern themselves and balance among other elements, risks and interests. To move further, a scientist who gains more money, lab space and personnel is then able to do even more (and possibly better science).

Merton described how scientists become more successful by virtue of their success. With each new discovery, a scientist will have more resources directed to him. This makes science easier for him as with enough experiments, something novel will eventually turn up. In this way, it is possible to explain why various areas of science are concentrated in very few institutions (this is true even today) and why a small number of labs concentrate most scientific funding. Merton importantly did not propose the *"Matthew Effect"* to critique it: he simply stated that science and scientific institutions function in order to develop and maintain an elite and a circulation of elites. This Merton thought (again) was not a defect of science and of scientific institutions, but an account of their proper functioning. *To put this problem in the spirit of republicanism: elites were to be drawn from the bottom, but once they developed they tend to aggregate.*

Thus, again, science has a difficulty with elitism. And elitism haunts discussions of science. But already we can see a way out from the acceptance of elitism from Merton and the “*normal science*” of Thomas Kuhn. Polanyi (whose ideas in many ways resembled those of Kuhn, though the latter did not give him much if any credit for it) conceived of science as a “*close knit organisation*” (Polanyi 2000). But when he discussed the “*republic of science*”, his account of science really encouraged a broad participation. There are elites in science, but elites do not control everything. In a similar way, there are orthodoxies and shared standards in science, but it is equally possible to rebel against both. So, again, there is a way out. To say that science is simply an “*elite*” is too easy an answer for Polanyi; for him, there is a tension between the elites in science and the members of the scientific community, who indeed provide most of the labour.

In the first instance (though this is complicated), elitism and broad participation in science is encouraged because no one individual has total knowledge of even a fraction of an area of science. On the other hand, a scientist can serve as a judge to a larger area of science and indeed, there is much overlap between sciences, say between biology and mathematics. It is in this way that scientific standards are maintained, but again these professional agreements can be easily disagreed with and are sometimes even circumvented. The standards of science are the “*seat of scientific opinion*” that is held “*by a multitude of individuals.*” And though no one could ever agree that scientific power is shared equally between scientists, it is worth underscoring that scientific worth and scientific status is maintained *between* and *among* scientists (Polanyi, quoted in Jarvie 2001: 549.)

It is fundamentally mutual. Therefore, as elite as any individual in a scientific organisation becomes, that elite status is not simply the product of the individual or of an institution which by necessity must accord status, but rather status is conferred through mutual action. Now, it may be the case that elites emerge and are maintained through the process which Merton describes, but in the case of Polanyi, there is a great deal of potentiality for bi-directionality in this republic of science between an elite or a *literati* and the more popular strata. It is also the case of course that scientists “*uphold the authority of science over the lay public*” (Polani 2001: 7). But this novitiate in a republican fashion is simply one of education and has nothing to do with natural rank or inherited status. In Polanyi’s account, scientists are an elite but one of education. In this sense, it is an open elite. There is a change in status, but it is the mark of superior knowledge and of training.

Nonetheless (and here more and more there are tensions between inclusion and elitism—much like the republican theory outlined in the beginning of the paper), this elite, though mutual, does through various boards and supervisory positions make nearly all appointments in all positions, while taking their time to “*pounce*” on any materials that appear in public which do not conform to the received scientific opinion. As importantly, so diverse is science that it leads to the more equitable division of resources.

For example, though it may be the case that the distribution of scientific resources is unequal in biology, it may not be so in astronomy. This holds out the possibility that if one science is controlled by an elite and is unequal, another science may not be. However, this orthodoxy is necessary. As importantly, this settled hierarchical method of maintaining public opinion in the role of science is also necessary because its own nature as an orthodox encourages dissent, a true novelty will inevitably arise out of a reaction to this orthodoxy. But, again, some of the perils of orthodoxy, namely stagnation, are necessary for the protection and the promotion of science.

One reason is that there is no specific reason why the scientific orthodoxy should be rational (or rational all the time.) Various periods in history have underscored that scientists, if not irrational, have not been entirely rational either or under the sway of an ideology. The second is more interesting. It is in the idea that orthodoxy or elitism or a specific positive or ideal serve to form a protective barrier around science. Polanyi sometimes then maintains that progress and the belief, maintained by an elite, serve as a defence of orthodoxy against pseudoscience. But, of course, one notices that progress in the 20<sup>th</sup> century though an arguable possibility is certainly debatable. One of the greatest feats of scientific “*progress*” for the Frankfurt School and others is the atom bomb. And scientists do not defend ideals nor live up to them.

So, there is a defence of an ideal and a defence of an elite. Neither, sadly, will work. And this is where Popper comes in. But how he comes in is intensely problematic, as Jarvie points out, for Popper proposes no clear institutional framework for a “*republic of science*”, what he calls the ideal forum for the discussion of scientific ideas, evidences and opinions. He has in mind, Jarvie notes, jury trials, in one instance to show how institutions could serve to coordinate the testing of scientific ideas and the process of error correction. Let us, however, just assume that what is most important for Popper is not institutions but first total freedom to express (which assumes a liberal democratic or republican government) and second an epistemological assumption on the part of all the members of that society.

For Popper, on the other hand, there is one regulative ideal: we are all in error. It is a *via negativa*, a negative epistemology. Popper’s idea of a republic of science is where the dialogue is fully participatory because of the conviction that regardless of one’s expertise, one can always be incorrect. This is a regulative ideal because this is the mark of a valid science. As Joseph Agassi has outlined, Popper’s negative epistemology is the idea that the goal of philosophy, science and politics alike is to acknowledge not only the ubiquity of error, but to look at the work of science, philosophy and politics as error correction. Thus, in taking any given, the work of the scientist or politician should not be to preserve the existing order, or to maintain an ideal state, but to understand that any polity, any body of scientific knowledge, is more than likely imperfect, and so it is in some way in error.

The ubiquity of error, moreover, necessitates the role of the public and the function of dialogue. If error is ubiquitous, as Agassi and Popper have argued, then error is ubiquitous regardless the person or his station. This means that contrary to the Polanyi-Kuhn “*authoritarian account of science*” that to be an expert is of no concern, to be a “*genius*” is of no concern. Experts and those of the “*rank and file*” are equally incorrect.

As importantly, errors are only corrected through another pointing out the error, this “*other*” pointing out the error of course must be a member of the public and, indeed, it is often outsiders who are the most useful in pointing out errors. This is what is sometimes also understood when one describes objectivity.

Thus, in Popper’s scheme the republic of science is defined by the capacity to admit that error is ubiquitous and the ability of anyone to point that out. Ian Jarvie points out much the same. In contrast to Polanyi’s account where science functions by being exempted from democracy—a specific community apart from it—in Popper’s republic of science “*there is a direct public interest in the openness of the republic of science*” and “*anyone, potentially, can contribute to the progress of science*” (Jarvie 2001).

Now, interestingly, this does not mean that everyone will constantly point out errors and that “*all beasts will hold court*”. In every scenario, those interested in science will

"self-select". Not everyone will take the time to learn enough of the detailed matter of science to point out errors. But it may be the case that outsiders can point to some gross errors. And while there will be "an elite" perhaps in terms of knowledge or position, the regulative understanding that all are most likely in error takes much of the egoism out of the elitism.

This connects to politics in the following way: Popper, whether idealistically or not, understands that all political institutions, like all scientific ideas, "are hypotheses" (Jarvie 2001: 554). Popper held therefore that any political institution, like any scientific idea, was prone to error. As governments are in some sense open to the people, responsible, and accountable to them, so to was science open and accountable to the people, so that people can critique errors. As importantly, the function of any society was to educate its members in its institutions. Increasing education in governance, in fostering public spirit, had the effect of proofing institutions from corruption. In the same way, science education makes error correction easier.

Popper also understood that science and the societies in which it functioned were in a dynamic. Science cannot be free if society is not free. Thus, the freer science is, the freer society becomes. As importantly, if the public good is degraded, this does not bode well for science. If truth—as a public good—is abused, then truth in science is impossible.

Science in another sense is much like politics and the political order. There is a fundamental problem in politics and in science where elitism in government and elitism in science is one solution to the problem. In science, this problem is how even instrumental knowledge and instrumental progress is possible; in politics, how a good society may be maintained. The recourse to elitism is an attempt to achieve progress, but it assumes that ability, and truth, resides only in a class of person; it depends on the type of elitism whether it is class by nature or class by convention. However, distance from the truth is not class bound—it is unclear why elites would have a better or more certain access to knowledge. Furthermore, there is no rational justification for elite status, by any measure. In the same way, it is unclear why elites would manage the work of government better than an ordinary individual.

The problem of elites has developed out of what seems to be a universal constant: the issue of lies and malfeasance of some sort. Science and politics both have an issue with pseudo-science, as there is outright fraud in science and there is outright fraud in politics. Lying, moreover, is an essentially antidemocratic problem, as importantly, any correction, especially in public, any refutation of an idea is not only good for science, but good for the society in which such refutation operates.

A word finally on education and enlightenment, especially for the reader who noticed the earlier point. Discussions of republicanism frequently underscore the importance of enlightened opinion, and frequently become stuck when an awareness dawns of the difficulties of enlightening the general populace. Most basically, the *via negativa* and Popper's way of error correction does much in solving this, as error correction is education. Error correction is simply the Socratic method (Popper, Agassi and Jarvie all understand that critical rationalism is not in any way original—the method of critical rationalism is simply the Socratic method.) Thus, again, philosophy of science and republicanism can mutually benefit as both are concerned with the education of the citizenry, while Popper's philosophy of science simply makes the method of education more explicit.

## Concluding Remarks

We have tried to unify inquiries that do not often work in concert with one another. These are the theories of republicanism and the proper polity and the philosophy of science, especially philosophy of science in North America after the Second World War. Scholarship concerning the problem of elites in republicanism and the role of the public is well-known and perhaps an almost intractable problem. Underscoring this, we have presented a fresh look at this problem in the work of both Jean-Jacques Rousseau and James Madison. Elitism and the problem of public participation in the production of scientific knowledge is just as intractable a problem in the philosophy of science. Philosophy of science suffers from an “*authoritarian*” inclination. We proposed further that there is a way out of this authoritarian inclination through the methodology of Karl Popper, Joseph Agassi and Ian Jarvie, and that this methodology should be of great interest to republican theorists.

Instead of supposing that the good polity is to be preserved, we propose that science and politics in the ideal republic be an exercise in error correction. Good science can only function in a good society, and vice versa. This is because the popular will may often be wrong; indeed, it is the case that this is the only way progress is affected, through the correction of actions and of ideas. Institutions, much like ideas, are merely hypotheses, and when it is realized that truth can function as a great good in both science and in politics, both society and science can benefit from an open and broad discussion of hypotheses and errors.

In its most optimistic vein, philosophy of science can certainly open a dialogue about functionaries and the structures of government. Are functionaries necessary? What is the role of a chief executive? What should the separation of powers be? In the view of philosophy of science and negative epistemology, functionaries become functional rather than essential, and the separation of powers moves from the necessary to the pragmatic. Functionaries should serve only so far as is practicable, as should executives. Powers should be separated so that they create dialogue and opposition, according to Popper, but if it causes stagnation or strife, one can easily see *any organization* of the polity as an error and adjust.

Popper’s negative epistemology and his account of the necessity of dialogue and disagreement also places Madison’s account of factions, no matter how critical he was of them, in an interesting perspective. From the standpoint of Popper and Agassi, factions, insofar as they disagree, may be argued as benefices rather than impediments. If disagreement is to be fostered, rather than unanimity, is there a more positive role for factions? Can Popper’s epistemology then not only give a way out of elitism, through an understanding of the parity and the necessity of public engagement through dialogue? We argue tentatively yes; that in fostering disagreement, in promoting criticism and dialogue, there is a role not only for the public, but a solution to the problem of disagreement itself in republican philosophy.

Even more provocatively and tentatively, we perhaps suggest that the philosophy of science sharpens Madison’s commitment to communication, where dialogue as the check on those in power is certainly consistent with Popper’s account of criticism. Dialogue for all republican theorists is an essential part of any good government. In a like way, the epistemology of error could also suppose a legislator in front of his constituents, *pace* Rousseau, with the Popperian adjustment being that the legislator legislates with the idea that he will most likely be wrong and that his dialogue with his constituents will lead to better policy. In the case of Rousseau, Popper’s epistemology acts as a supplement, where the nation’s own will is a form of consistent correction. Thus, philosophy of science brings many of the

most interesting ideas in republican theory to another kind of *fullness* and sharpens them, leading to better and better discussions.

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