

## Popper's Sociology of Science and Its Political Deficit

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### ABSTRACT

The paper offers a distinctive reading of Popper's work, suggesting that his *Logic of Scientific Discovery (LScD)* might be re-interpreted in the light of his *Open Society*. Indeed, Popper can be interpreted as criticising certain aspects of his first book, and as a result improving upon them, in his second. It suggests translating what Popper says about 'conventions' into his later vocabulary of 'social institutions'. Looking back, I believe that Popper never intended the language of conventions and decisions to be read individualistically. I remain unsure whether Popper was himself quite as clear about this as he could have been. My reading makes Popper a pioneer in the sociology of science. Scientific institutions are arenas of political power; but Popper did not discuss the structure and inter-relations of the social institutions of science, or offer a politics of science in the context of his methodology. What is missing from the skeletal sociology of *LScD* is the politics. We could put it in Popperian terms this way: scientific institutions are both open and closed. They are closed, firmly, to the inexpert, to the non-members; supposedly they are open to the qualified, provided the prerogatives of seniority and leadership are acknowledged. Despite these shortcomings, Popper's critical and rational approach and his insistence on openness and intellectual honesty are still important today.

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My theme is: revisiting the classics. One reason is to refresh our recollection of points made by the classics. The second is to treat them with respect but at the same time to criticise them. The third is that we can then connect them to our present condition and see if they offer ways for us to think about current problems.

My paper treats Popper's major works as the classics in question.

Popper started out in one of the technical side channels of philosophy, philosophy of science. His influence, however, was eventually to be felt far beyond this technical niche. He is a provocative, even a controversial thinker. He has only a small circle of real followers, but he has had a remarkable degree of influence on the agenda of many of the fields to which he contributed.

I shall focus on two works of Popper, originally published 11 years apart. Popper's first book, *Logik der Forschung*, was published in German in 1934 with the imprint "1935". 11 years later, at the end of 1945, he published, in English, his two-volume work *The Open Society and Its Enemies*.

The usual reading of Popper's first book, known in English by the slightly altered title of *The Logic of Scientific Discovery*, which I shall abbreviate to *LScD*, treats it as a work of pure philosophy of science. Four years after its publication, stimulated by the Anschluss of 1938, this usual reading of it continues, Popper decided to write about why intellectuals supported totalitarian ideas, a project that became *The Open Society and Its Enemies*. In that second work Popper extended the results he had achieved in philosophy of science to history, politics, and society. This reading utilises the earlier *Logic of Scientific Discovery* to cast light on the later *Open Society and Its Enemies*. By and large, this reading accords with Popper's autobiographical account (Popper 1974).

Without denying for a moment that Popper did indeed apply and extend his early ideas when writing about history, politics, and society, I have found it fruitful to reverse the direction of interpretation and to look into his supposedly purely philosophical first published book for traces or early versions of his later political and social thought. The fruitfulness of this reversal is that it allows us to view the relation between the two books as a critical one. Popper can be interpreted as criticising certain aspects of his first book and as a result improving upon them in his second. This in turn encourages us to push the criticism further and seek still more improvement. And all this is in the spirit of the philosophy that permeates both works namely, that we learn from criticism and by the discovery of error.

My backwards reading of the two books discloses, to summarise, that Popper was already a proto-sociologist at the time of *LScD*. He there showed by argument that some of the traditional problems of that field, especially the problem of demarcation, demanded to be solved in social terms, by means of what he called the adoption of conventions. In my view the best translation of the language of conventions into his later vocabulary is "social institutions". I remain unsure whether Popper was himself quite as clear about this as he could have been, especially because he never claimed the priority he is entitled to, namely that of being a pioneer of the sociology of science.

I further claim that this reverse analysis sharpens the criticism of the earlier work that can be made in light of the later. Here I will concentrate on two main points: although Popper sees science as constituted only in and by certain social institutions, he offers no discussion of the structure and interrelation of those institutions. The other point is that although he has the elements of a sociology of science, he does not have a politics of science. In fact, his main paradigm for the rational and critical discussion that goes on in science is the Socratic seminar. This is an interesting choice of model. For one thing the Socratic seminar is apolitical. For another it has only minimum internal structure. And in sketching the Socratic seminar Popper did something he criticised in others: he beautified the seminar and the character of Socrates. In particular we get no sense of how the various schools and parties of thought of Ancient Athens related to the Socratic seminar.

So much for an overview, let me now go back over these points and develop them.

### 1. The Received View

*Logik der Forschung* or *LScD*, is a masterpiece of philosophical writing. Its prose is simple, direct, and terse -- indeed, at times quite dense. The book has a clear if somewhat unusual structure, and in its short compass it manages to lay out the main problems of the field to discuss their formulation, the kinds of solutions that will be viable, and the principal arguments that can be employed for and against the major positions. It is an explicitly normative investigation of how best to proceed if we aim to foster the growth of scientific knowledge. It treats science as necessarily a collective activity to which both co-operation and competition contribute. This collective activity governs itself by rules of procedure which are freely proposed and debated. The supreme rule that governs all the subordinate rules is to the effect that the other rules must be designed so that they do not protect any statement in science against falsification. This rule requires that science should always strive to be intellectually honest, and, especially, it should not encourage acting defensively when ideas are challenged.

What then is being referred to when we discuss empirical science? Popper proposes that we take it to consist of the set of theories that can be falsified. Only theories which can clash with experience should be taken as part of science. We learn from experience, Popper says, when statements describing it clash with science and force upon us the choice between the theory, the experience, or the inference connecting them. It is notable that the set of theories that can be falsified includes both those already falsified as well as those not yet falsified.

The scientific impulse, Popper thinks, is the impulse to refine raw ideas, vague speculations, and the like, into clearer and more precise formulations that can be tested against describable sense experience. So, falsifiability is a goal. Achieving that goal may be by no means a piece of cake. Another way to put the principle is that a statement that can clash with a statement describing experience is empirical and a candidate for the inventory of science. (It is not included in the inventory until it has actually been tested.) Another way to put it is that, for Popper, irrefutability is for science a vice rather than a virtue.

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## 2. Defects of the Received View

On first glance, this position might strike one as philosophically unremarkable. But recall that I said that the methodology is normative. The aim is to discover and articulate the best set of rules for governing the activities we call doing science. The best set is the set which best promotes the growth of scientific knowledge. The growth of scientific knowledge is the progression towards ever more general, ever simpler, and ever deeper descriptions of the structure of the world. These rules, then, are themselves subject to discussion and evaluation. That evaluation is not empirical, although it is consequential. Methodological discussion attempts to think through the consequences of different proposed rules and to choose that collection of rules that maximises the possibility of empirical criticism.

When I first read Popper's *LScD* and came across the words conventions and decisions I naively thought that he meant that each person, in choosing to do science rather than something else, opted to follow the rules and made their scientific decisions accordingly. Yet at the back of my mind I had a worry. I had read his great masterpieces in reverse order. *The Open Society and Its Enemies* of 1945 was my introduction to Popper's writings. He mentioned *LScD* in that book, but it was at that time untranslated. Upon reading the translation at proof stage what should have worried me a lot, but in fact worried me very little, was that Popper's language of conventions and decisions could easily be read as I had read it, individualistically. Yet the Popper of *OS&IE* was emphatic that to make conventions and decisions work they have to be embodied in a permanent structure of institutions.

Looking back, I believe that Popper never intended the language of conventions and decisions to be read individualistically. He writes clearly in *LScD* that there must be intersubjective testability, there must be some sort of collective judgement where there is dispute, and he refers to what he later called the friendly-hostile co-operation of scientists with one another. Such co-operation and competition must need sit inside an institutional framework. Science is not a solitary but a collective activity and so its conventions and decisions are institutional, not individual. The society of scientists has individuals as its citizens, perhaps, but the conventions the society adopts and the decisions it takes are properties of the collective structure, not aggregates of the individual choices. The examples Popper gives of scientific institutions are congresses, learned societies, journals, laboratories and so on. These are the structures in which the methodological rules function.

In *LScD* then, Popper envisages science as a self-governing collective of seekers after truth, an institution or set of institutions in the realm we know as civil society. Scientific institutions are of course remarkable in a number of ways that set them apart from other social institutions. Popper does not spell this out, so I shall do so. Their ideals are egalitarian. This goes all the way back to Sir Francis Bacon who held that all that was required to do science was the native intellect with which we are all more or less equally endowed plus the appropriate organisation. Scientific institutions are officially blind to differences of language and nation, since ideas leap over those

boundaries. Scientific institutions are officially dedicated to the traditional philosophical aim of following the argument wherever it leads. But this is not a goal that respects age, rank, sex, ethnicity or any of the other divisions of humanity, nor does it defer to traditions, authorities, and scriptures as humans so often do.

What is missing from this skeletal sociology of *LScD* is the politics. We could put it in Popperian terms this way: scientific institutions are both open and closed. They are closed, firmly, to the inexpert, to the non-members; supposedly they are open to the qualified, provided the prerogatives of seniority and leadership are acknowledged. Free inquiry into anything and everything is highly likely to produce a clash between science and society. Furthermore, all scientists are citizens of one polity or another and this means both that they may have divided loyalties between science and society, and that they may experience pressure to hail the science of their fellow citizens rather than that of outlanders. And finally, most glaring of all, we cannot overlook the internal politics of this transnational society of scientists. A near contemporary of Popper's, the physical chemist and philosopher Michael Polanyi, described scientific institutions as anything but internally egalitarian; rather they were gerontocratic. So far from being egalitarian they were hierarchical. The clash, however, is only apparent. Polanyi is reporting how scientific institutions actually are; Popper, by contrast, is interested in how scientific institutions ought to be. The clash re-emerges, though, because Polanyi argues that since science is accumulated expertise, and since expertise has legitimate authority, and since there is no outside standard by which to judge, scientific institutions cannot be other than hierarchical, gerontocratic, and authoritarian. But this is becoming a digression and I must return to my main point about politics.

Neither Popper nor Polanyi gives enough attention to the existence of schools of thought and parties in scientific institutions. I do not mean only parties or factions in the learned societies; I mean also parties and factions in intellectual endeavours. There are parties that defend one theory or approach against rivals, parties that cluster around leaders, or institutions. There are parties that go on trying to sustain an idea even though others think it a lost cause. Even we, the general intellectual public, are aware of such divisions. There was good press coverage in the mid-twentieth century as the originators of steady state cosmology tried for quite a few years to sustain their theory against the ascendant Big Bang alternative. The various parties within evolutionary biology are often written up in generalist publications. In his clash with Niels Bohr, Albert Einstein had only a small party of followers who echoed his doubts and questions, yet his dissent is perhaps better known amongst the less expert than among the more expert.

There are, then, intellectual politics, institutional politics, and leadership politics in science. There are also the politics of power and money that increase in importance in those areas of scientific research that require large infusions of the latter. These political matters are played out concretely in how students are taught, in how learned journals select, in who runs for office in learned societies, in how some research finds favour and other research does not. It would be a naive sociology that regarded all this politicisation as somehow inappropriate. Such politics is a function of the fact that groups identify their interests as different from those of other groups and

that all individuals are at one and the same time members of diverse groups. Politics arises as the institutional way of mediating such disputes. It functions as a means of thrashing them out and trying to devise compromise. It is when political considerations take precedence over intellectual ones on intellectual questions that one has a problem. It seems to me that the politics of scientific institutions as well as their structure should be part of the discussion of method.

### 3. The Open Society

Some of the lines of thought I have been pursuing draw on ways of thinking about history, politics, and society that I learned from reading Popper's *The Open Society and Its Enemies*. This work, which has been in print since 1945, has gone through several editions. The Open Society is Popper's term of art for the kind of society that the thinkers of the Enlightenment yearned for. The enemies of the Open Society are totalitarians of the right and of the left. The growth of human freedom brings change and uncertainty; its opponents hope that more control and less freedom will bring stability and predictability. Popper thought that both left and right totalitarians were uncomfortable with change and uncertainty and sought their opposites either in a return to the past or in an attempt to accelerate our progress to a stable future state. The anti-fascist war which was raging as Popper wrote is scarcely mentioned in the book. But he was quite explicit in naming Communism as the next enemy of the open society and in drawing sharp parallels between it and fascism, indeed viewing fascism as an offspring of Communism.

The argument of the book took the form of an inquiry into the intellectual ancestry of totalitarian social and political thought, with special reference to understanding how some of history's greatest thinkers had endorsed the closed society. Additionally, Popper discussed why so many people of good will uncritically overlooked these intellectual feet of clay. Famously, the butts of the book were Plato, who Popper both extravagantly admired and harshly criticised; and Marx, with whose aims and outlook Popper sympathised, whilst unflinchingly pointing to his scientific errors. There was also a tirade against Hegel and his influence that brought Popper much obloquy, even though most of its content was taken directly from Schopenhauer and Kierkegaard.

As his contribution to the social sciences Popper argued that social problems required the growth of social knowledge, and that in turn required a falsificationist or critical attitude to the theories and proposals that reformers and revolutionaries put forward. He found intellectuals all too intoxicated with theory and unwilling to distinguish science from prophecy. He showed that we learn about society by tinkering with it, but that if we tinker too extensively all at once we will be unable in the outcome to distinguish cause from effect. So, if the outcome is successful, we may mislead ourselves about how this was achieved; if the outcome is unsuccessful, we will not be able to identify where we went wrong.

He also vigorously and controversially attacked the usual treatment of the problem of sovereignty. Thus, he opposed the political idea that the good or the best should rule. In general, he thought the less legitimacy the better. He seemed to think that rulers varied along a scale not of good to bad, but of bad to worse. The best government was the least bad. He tried to shift the focus

of attention to the problem of tyranny which he formulated as: how can we get rid of unwanted rulers without violence? Democracy was no more than one set of solutions to that problem. The freedom to rid ourselves of unwanted rulers without violence was the basic test of the open society. Other tests were freedom of speech and thought and, crucially, freedom to emigrate.

What of science? Completed 9 years after the publication of *LScD*, *OS&IE* contained some new points about science.<sup>1</sup> First of all Popper generalised his negative philosophy of falsificationism into that of being critical, in recognition of the fact that in many cases we can criticise even though we cannot refute. We learn by trying to make ideas criticisable and then engaging in critical discussion of them. Empirical falsificationism thus becomes the limit case of criticism. Some of the inspiration for this generalisation of his negative philosophy comes from Popper's reading of the case of Socrates, put to death for insisting on exercising his critical faculty in a religious quest to find the truth. Socrates deflated the pretensions of experts with arguments, and offered arguments against his accusers. He is one of the heroes of Popper's book. Popper draws a parallel between the Socratic seminar, where all-comers are equal and the only power is that of rational argument, and scientific inquiry. As with *LScD* itself, the aim is normative. Science is the rational practice of the Socratic seminar with empirical criticism given pride of place. Not all criticism in science is empirical refutation, but the most decisive is. This view of science is extended to social and political matters where, similarly, rational criticism is what we should aim for, and when we can make rational criticisms that are empirical refutations, we have the social sciences. Indeed, democratic society itself is viewed as the Socratic seminar writ large, the pooling of the critical talents of the citizens to reach consensus around the solution to urgent social problems. Each piece of legislation, each institutional innovation, is a social experiment. We learn from our failures.

In the course of elucidating what he calls the public character of science Popper considers the question of whether it can be a solitary activity, whether the individual mind can do science. In an interesting passage he concludes that it cannot. He offers the thought experiment of Robinson Crusoe, the well-educated scientific inquirer who becomes a castaway. Common sense would suggest that with his training and his instruments Crusoe could go on accumulating observations and making conjectures to explain what he recorded. But Popper allows that this could be worthwhile only for a short time. Not having the external check of having to articulate his ideas for others and to cope with their criticism, Crusoe's work would soon be no better than soothsaying or, as Popper calls it, "revealed science".

Science, like the Socratic seminar, embodies the attitude of reasonableness, but this attitude is a social rather than an individual achievement.

Reason, like language, can be said to be a product of social life. A Robinson Crusoe (marooned in early childhood) might be clever enough to master many situations; but he would invent neither language nor the art of argumentation... .

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<sup>1</sup>. It was completed in 1943. It took more than two years to arrange publication.

Thus we can say that we owe our reason, like our language, to intercourse with other men (*OS&IE*, II: 213/225/250).

This is a powerful and interesting position: science is necessarily a collective activity; something that isolated individuals cannot accomplish. It is an activity which makes use of each contribution and hence belongs to everyone. Science is a microcosm of the rationally organised society. The problems of society include some that are scientific and others that are not. Free discussion and criticism is the best approach to either for obvious reasons that were articulated by John Stuart Mill.

The scientific questions are mostly technological: how to arrange society so that specified goals are achieved. Technology needs to be obedient to good science, and that comes when the goal of the latter is the pursuit of truth. Other social questions will involve choices that are not technological or scientific. But if society is already organised to give voice to different points of view and their criticism these other goals will be most rationally chosen if the equality and dissent of all citizens is deferred to. Very clearly, like science, society has in Popper's view to be secular. A qualified science, like creationist science, or Islamic science, or Jewish science, where the antecedent term denotes religious partiality, is a contradiction in terms. The same goes for the open society. A society cannot be at the same time open and subordinate to an ideology, whether that is a social, political, or religious ideology. That subordination sets a limit to criticism and to learning and hence is a closure. The secular framework is not itself such an ideology, for example an anti-religious ideology, but a means of gaining the social co-operation of all members by forcing them to set limits to their ambitions to exert hegemony over those who do not agree with them on social, political, or religious matters. Like many thinkers, Popper considers it a measure of a society how well it institutionalises the protection of minorities.

#### 4. Further Critical Reflections

I have already articulated one criticism of Popper's social view, namely failing to find a place for politics, even to acknowledge that politics pervades intellectual life, including scientific life. The problem is that political compromises, even when achieved by reasonableness, take account of other than intellectual considerations. To this I would respond that scientific institutions are mixed, as are almost all institutions, so such other influences are inescapable. The question is how to limit their possibly corrupting effect.

Another criticism I would make of Popper is that he minimises what a thoroughgoing modernist he is. Most traditional societies embrace partiality: the partiality of tribe, of ethnicity, of religion, and so on. Only in the modern era has the morality and legitimacy of these arrangements been called into question. Qualifications on citizenship have been challenged. Demands for equality have become thoroughgoing.

Popper writes as though it is plain for all to see that tribalism is regressive and that openness is virtuous. He attacked the totalitarians of the right and the left as new tribalists, on the one hand, and killer utopians on the other. One anti-modern, the other ultra-modern. He wrote as though the



social agenda of the Roman Catholic Church, or of the hope of Sharia, or of new orthodox communities, were issues of the past. Perhaps to a European progressive in the period 1938-1943 that seemed to be the case. I think that were Popper active today he would be horrified by the attacks on Enlightenment that come from some of his fellow-intellectuals. This would be, for him, a new treason of the intellectuals. My sympathies are all with Popper here, but sympathy is neither explanation nor means of coming to terms with the facts. Clearly modernity has disappointed the expectations of many, by no means only intellectuals. Whether it can be saved from the latest onslaughts and by what means are questions for those who are still concerned with the agenda of *The Open Society and Its Enemies*.

A further criticism is that his sociology of the Socratic seminar is defective, and its generalisation to science in the first place and society in general in the second, is unworkable. When I say his sociology is defective, I am not referring to its descriptive defects. He is, after all, conjuring an ideal type. What I am referring to is deficiencies in the ideal type. The Socratic seminar is a spontaneous and virtually unstructured order, a congeries of co-operating individuals. The only structures I can discern in it are that Socrates is usually the one who invites participation and usually dominates the discussion, and that there are temporal limits to each session. Science as collective activity cannot be modelled on such a structure for the simple and obvious reason that science contains no single dominant figure, that it is highly specialised and consists of many seminars running simultaneously, and each simultaneous session contains parties and schools of thought, such as always emerge in real debate. Popper makes no place for party politics in science, and hence gives no account of their positive part in its functioning. In the spirit of his work one might argue that parties and schools of thought are the institutional versions of scientific ideas. Cooperative critical discussion of ideas is fostered by these institutions, thus making them part and parcel of the collective functioning of scientific discussion. No institutions are perfect, as Popper notes, so these party formations bring problems as well as advantages. Yet there is little serious discussion of these matters. Isolated figures who try to raise them, like Joseph Agassi and Steve Fuller, are greeted with hostility and denial.

As a collective activity, as a congeries of institutions, science is bound to have internal structures and external relations with other social structures. All of these are problematic. It can perhaps be argued that the openness of science's internal structures is an internal concern. I would counter that since there is an interface with the wider society outside interests cannot be excluded. A great deal of public money goes to science, and wherever public money goes there is a presumption, in an open society, of public accountability. Fraud in science captures the interest of the public, which also suggests that support of science is a form of public trust. A great deal of science is housed in public universities and these are subject to public scrutiny. Above all, science commands status and authority in society and makes great claims for the social benefits it brings. This cannot but attract general forms of supervision. To think of this as outside interference is not only defensive, it is to imagine that science can benefit by decreasing certain critical inputs. Polanyi says so plainly.

In these days of the COVID-19 pandemic, politicians are urged to “follow the science”; when the science changes, politicians and public are bewildered and wonder how science can be trusted.

Popper thinks public control is the same as control by the circle of specialists. His ambivalent attitude comes out in the following passage where he is discussing the public testability of scientific claims:

This aspect of scientific method shows what can be achieved by institutions designed to make public control possible, ... even if this is limited to a circle of specialists. Only political power, when it is used to suppress free criticism, or when it fails to protect it, can impair the functioning of these institutions, on which all progress, scientific, technological, and political, ultimately depends (*OS&IE*, II: 206/218/242).

The message seems to be that political power should stay back and let science pursue its mission. As I hope I have shown, there is a lot more to it than that. Scientific institutions are themselves arenas of political power, and they connect to political institutions in the wider society. Means have to be found to combine this fact with public supervision and genuine openness to free critical inquiry. Our societies have legislated the forms of governance for the professions of medicine, law, and accounting; I wonder if one day they will want to do that for science, both natural and social. If they do, we can expect resistance from within science because such initiatives will be clearly seen as restricting its autonomy in return for its monopoly of expertise. Above all, such professionalisation would impose responsibility and accountability to a degree presently quite unknown in science.

Such a move would perhaps regularise or perhaps merely reduce the incoherence of science as institution. It is difficult for politicians, in public health or elsewhere, to follow the science when science is an arena of intense and endless debate. Science is institutional scepticism and so for any alleged general consensus it is not difficult to find competent dissenters. This is a price that we cannot avoid paying. It is the same price we pay for being in open societies. They are messy, inefficient, and far from the best we can imagine. Yet all the alternatives are much worse.

To conclude, it seems to me that the politics within science have become central issues and that rereading the arguments Popper published at the end of World War II is a fruitful place to begin thinking about them. He was writing before the atomic bomb. He wrote at the very beginning of what we now call Big Science. He wrote long before our crowded earth tried to devise global strategies against pandemics. But his articulation of a critical and rational approach, and his insistence on openness and intellectual honesty are values for today as much as for yesterday.

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