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Neurath's Ship Meets Social Epistemology

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Imagine sailors who, far out at sea, transform the shape of their clumsy vessel from a more circular to a more fishlike one. They make use of some drifting timber, besides the timber of the old structure, to modify the skeleton and the hull of their vessel. But they cannot put the ship in dock in order to start from scratch. During their work they stay on the old structure and deal with heavy gales and thundering waves. In transforming their ship they take care that dangerous leakages do not occur. A new ship grows out of the old one, step by step—and while they are still building, the sailors may already be thinking of a new structure, and they will not always agree with one another. The whole business will go on in a way we cannot even anticipate today.

That is our fate. —Otto Neurath

Neurath's oft-quoted simile about the battered sailors gives a precise depiction of the human condition (Neurath 1944). Like other animals, humans face constant threats to their survival, but, unlike them, we are not adapted to a particular natural environment in which we can feel at home. We cannot swim in the ocean like fish or whales. Our superior intelligence, however, enables us to develop tools and artifacts that help us handle a broad spectrum of perils. These tools are essentially collective, aggregating the efforts of a multitude of individuals. Key among them are institutions for improving our knowledge of the world and arming us against its threats. In all these endeavours, we must work with the things on hand, bootstrapping ourselves out of our cognitive and bodily limitations. There is no firm transcendent ground to stand on, nor, to use a more recent metaphor coined by Richard Rorty, any "skyhook" from above to lift us out of trouble.

Our predicament is exacerbated by the fact that the perils we face today are increasingly of our own making. In the current geological period, the *Anthropocene*, society has to deal with manmade challenges such as wars, climate change, pandemics, pollution and reduced biodiversity. Some of these pose "clear and present dangers" that call for immediate action. On the positive side, we are not entirely left to the *ad hoc* improvisations suggested by Neurath's sketch: We are assisted by a discipline that deals precisely with how societal knowledge production should be organized to improve its efficiency. It goes by the name of "social epistemology."

Unfortunately, social epistemology is not exempt from the conditions described above, as there is no transcendent platform from which it can operate. This is apparent from the observation that social epistemology itself comes in several different versions, each subscribing to its own epistemological principles. The main representatives are Alvin Goldman's "Analytic Social Epistemology" and Steve Fuller's "Critical Social Epistemology" (as I have dubbed it elsewhere). After an initial skirmish, the two fractions have largely ignored each other's existence.<sup>1</sup>

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<sup>1</sup> The skirmish may to some extent have been *a priori* dispute. Fuller adopted the term 'Social Epistemology' as the name of a journal he founded in 1987, and reused it as the title of a 1988 monograph introducing the

Analytic Social Epistemology (ASE) and Critical Social Epistemology (CSE) are best seen as complementary approaches to largely overlapping clusters of problems, ASE being individualistic, bottom-up, model-building, formalistic and systematic, while CSE is holistic, top-down, sociological and historical. There are also significant differences with respect to normative involvement, of which more anon. The complementary character of the two branches of social epistemology suggests that a collaboration could potentially be fruitful, but such collaboration is regrettably not in the cards.

Unfortunately, neither ASE nor CSE has delivered satisfactory responses to the “clearest and most urgent” threats to mankind’s future today, although our precarious situation has dimensions that belong squarely within the ambit of social epistemology. To show this, I will ask for the reader’s patience while I add a new paragraph to Neurath’s story above:

As they are busily rebuilding the ship, the sailors are alerted that there are dangerous skerries ahead. There is a great risk that the ship will hit a rock and founder. The situation calls for precise navigation, and for the moment, everybody’s attention is directed towards the new challenge, as they put aside the long-term project of improving the seaworthiness of the ship.

The literal equivalent of the rocks and the threat of shipwreck are the manmade challenges mentioned above, of which the most urgent is climate change. I will illustrate the alternative strategies adopted by the different branches of social epistemology in terms of this example.

### **Alvin Goldman and Analytic Social Epistemology (ASE)**

Analytic Social Epistemology adopts a strategy akin to the 18<sup>th</sup> century inventor James Harrison’s project of refining chronometry as a tool for accurate marine navigation. The work was carried out in response to the British parliament’s Longitude Act of 1714, which invited proposals for methods to calculate a ship’s longitude at sea. The best submissions would be rewarded with the equivalent of 2.5 million £ in today’s prices.

The Act was prompted by the Scilly naval disaster of 1707, in which, due to an erroneous calculation of longitude, a naval squadron foundered on the Scilly rocks, losing four ships and upward of 1500 men. There were already several methods of calculation in use in the navy, but all suffered from imperfections. Whatever approach was adopted, any response to the Admiralty’s request would pass through four phases:

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discipline. Goldman opened very similar theoretical vistas in a 1987 article entitled “Social epistemics” (Goldman 1987), which remained his designation for the new approach for some time. Soon, however, “social epistemology” would become the generally accepted name, and Goldman would use it in the subtitle of the journal *Episteme* that he launched in 2004, dedicated to the new field. There has been little willingness on the side of Analytic Social Epistemology, however, to recognize Critical Social Epistemology as a closely related undertaking. This is manifest in the *Stanford Encyclopedia* entry on social epistemology, of which the most recent version from August 2019, written by Goldman and Cailin O’Connor, devotes only a single line to Fuller’s contribution to the field, very misleadingly describing it as an effort to debunk science.

First, selecting a procedure or mechanism that would deliver precise determination of longitude, in pure theory and under simplified and idealized conditions.

Second, elaborating the mechanism so as to enable it, again in theory, to function in the-real life setting of a rolling, pitching and yawing ship.

Third, testing whether or not such “ecological validity” had actually been achieved. This would be done by installing the device in a ship and check if it could direct it reliably and accurately to a distant destination and back to the point of departure.

Fourth, making the device available for general naval use if the test was successful.

As his first step, Harrison picked chronometry as his preferred method, which uses the difference between the ship’s local time and the time of a reference place (*in casu* Greenwich) to calculate the longitudinal separation between the two locations. This required the construction of a clock which would reliably show Greenwich time, even at sea. Thus Harrison’s main efforts were directed at the second step, developing a pendulum clock that would keep the time even under the highly challenging conditions of a ship under sail. He sought to insulate the clockwork maximally not only from the movements of the vessel, but also from changes in temperature and other environmental impacts. He produced a series of prototypes, of which some were tested but with negative results. This would only spur Harrison to increased efforts, and he finally managed to build a model that passed the very exacting terms of the Longitude Board’s test.

Unfortunately, because of its excessive cost, Harrison’s clock was not adopted for general use. Thus, the fourth and final step of the programme was never completed, although improved versions of the design would be adopted by the navy much later. Partly for this reason, Harrison was not awarded the full sum promised by the Longitude Board, and he had finally to petition Parliament to get what he felt was owed him. Nevertheless, his effort to improve marine chronometry, stretching over more than 30 years, was not driven by the prospect of monetary gain, nor, it would appear, by a desire to make seafaring safer, but largely by the challenge posed by the technical problems *per se*.

Harrison’s approach to marine navigation is analogous to the strategy adopted by Analytic Social Epistemology. ASE starts out with a simple unit of individual epistemic computation, and gradually adds extensions and outer scaffolding to it to make it functional at the social level. The steps are laid out in Goldman’s *Knowledge in a Social World* (Goldman 1999). At the core of the procedure is *Bayesian inference*, which is a formal, statistical method for adjusting the degree of credibility of a hypothesis on the basis of empirical data.

As the first theoretical elaboration of this core, Goldman adds *testimony* to the data pool, a crucial step if the procedure is to move beyond individual epistemology and become genuinely social. Next, the methodology must accommodate disagreement among information receivers. A group of epistemic agents may assess the available evidence differently; hence, they have to resort to argumentation to obtain consensus. Thus, a theory of *dialogical argumentation* is called for, which Goldman proceeds to supply. Goldman next moves to *institutional* producers and distributors of knowledge. He analyses *science* as a mechanism for the generation of societally relevant knowledge, and the *media* as instruments for its dissemination. Finally, he examines *democracy* as a mechanism for marshalling knowledge, generated by science, the media and other sources, and deploying it to promote the population's ends.

In the period following the publication of Goldman's seminal treatise, ASE has worked almost exclusively on the initial stages of this sequence. (For the purpose of this paper, I take ASE to be defined by Goldman's writings together with the articles published in the journal *Episteme*, of which he now the Senior Advisory Editor). Special attention has been given to refinements of the Bayesian framework. Also, much work has been done on problems in the initial stages of ASE's social turn. One of them is resistant disagreement among epistemic peers, which will occur if argument fails to bring about conversion on either side. This raises the theoretical puzzle if the very fact of irresolvable peer disagreement gives the opposed parties reason to revise their views. A final complication, carefully analysed by Goldman, is how disagreement among experts should be handled by non-experts. This is an important problem, as it has implications for the way the general public should react to conflicting expert opinion on such urgent issues as climate change.

There has been little real-life testing of the proposed epistemic models, which would correspond to step three of the sequence described previously. The necessity of such empirical check is fully recognized by ASE: the reliability of an epistemic procedure as a generator of truth cannot be conclusively established *a priori*, but needs empirical certification. Unfortunately, such tests become increasingly harder to conduct as one moves from simple cases of interpersonal information processing to large-scale societal institutions for knowledge generation and dissemination, such as science and the media.

The most urgent current issue with respect to scientific expertise, however, is not disagreement among experts, but the growing disregard of scientific expertise as such in the general population. In terms of our maritime simile, it is as if, after precise chronometric determination of position had long been established maritime practice, ship's crews would suddenly refuse to use it. At a time when experts uniformly warn about impending ecological disaster, the popular lack of trust in scientific expertise should worry any social epistemologist. It calls for efforts to analyse the phenomenon and to restore popular trust in science. ASE'ers have scarcely addressed this problem, however. It is briefly mentioned by Goldman, but only in passing and in the context of an investigation of how to choose between disagreeing experts (Goldman 2018). The situation illustrates the way ASE'ers efforts are not driven by external, social saliences but by intra-disciplinary concerns,

resolving the puzzles and conundrums resulting from epistemology's social turn. There is even some retreat in ASE towards the comfort zone of classical individual epistemology.<sup>2</sup> ASE's status as a professional, academic enterprise also shows in its representatives' reluctance to take on the role of "public intellectuals." ASE's findings are almost exclusively communicated through academic outlets, with very little effort to reach out to lay audiences. This stance is common among analytic philosophers, a key motive apparently being the fear of charlatantry: one must never stray beyond one's field of specialty. Academic reputation might suffer, and however worthy the causes, one could easily become an instrument for forces outside of one's control. Moreover, ASE may still be secretly drawn towards a conception of philosophy as a meta-discipline that should not tangle with worldly matters, but only address technical problems emerging within first-order, world-related disciplines and practices.

### **Fuller's Critical Social Epistemology (CSE)**

Steve Fuller's CSE starts at the other end, conducting epistemology at the social level from the very start. Putting it in terms of Neurath's simile as just amended, CSE's approach amounts to a call for "All hands on deck," in order to secure everybody's full involvement in averting the threatening shipwreck.

The crew was alerted to the danger by the engineers servicing the esoteric Harrisonian device in the belly of the ship: The readings indicated that the ship was in the vicinity of dangerous skerries. The technicians admit, however, that there is considerable uncertainty about the reliability of the device which is still at the testing stage; they are not even fully agreed about how to interpret its readings. So, to be on the safe side, they recommend a radical change of course that will put the ship at a safe distance from the rocks. This suggestion generates loud discussion on the deck, and there is general opposition to the engineers' recommendation, which will greatly delay the ship's return to port. The captain recognizes that any workable decision must be acceptable to a large majority of the crew; otherwise, there will be a risk of obstruction or even open mutiny. So, everybody's views are given an equal hearing. Some young daredevils among the deckhands propose that they just manoeuvre around the rocks if they encounter them.

They are backed up by a handful of old sailors who assure everybody that they have seen it all before: There were scary reports of giant octopuses that could drag a ship to the bottom, violent whirlpools, treacherous sirens luring sailors to their death, etc., but none of these horrors actually materialized quite as predicted; the crews somehow circumvented the perils and lived to tell about it. Eventually, a majority consisting of the daredevils and the salty dogs convince the captain to stay the course and manoeuvre around the rocks if and when they are sighted. The captain wins over some remaining sceptics by promising them an extra share of the valuable cargo once they are back in port. The only opposition left comes from

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<sup>2</sup> In 2012, the subtitle of Goldman's journal *Episteme, A Journal of Social Epistemology*, was changed to *A Journal of Individual and Social Epistemology*. While maintaining a special interest in social epistemology, this would no longer be the journal's primary mission.

the team operating the Harrisonian device, but they have no choice but to go along with the majority.

The reader will have grown tired of the maritime metaphor by now, so I shall leave it and present Fuller's position in literal terms. It starts at the social level and thus at the opposite end from ASE's bottom-up approach. To CSE, the social level is inescapably political: Any strategy for tackling the climate challenge will be irrelevant if the general public cannot be persuaded to adopt it. In particular, any effective measure will involve costs that will affect the population unevenly. In a democracy, this necessitates a process of open debate about how the burdens should be distributed. Only thus will a solution be found that is acceptable to a majority of the population. Fuller is highly suspicious of approaches that empower an elite group to make the decision, based upon specialized technical knowledge, and subsequently to be imposed upon the general population.

The global nature of the climate challenge generates special problems. It invites free riders, and their even more troublesome kin, the Not-In-My-Backyard'ers ('NIMBYs'). These are people who refuse to make any sacrifice for the common good, thus blocking the required collective steps. Fuller has a strategy ready for this calamity: We should move ahead with the aggressive policy of technological development and deployment that is needed to stave off the climate challenges, but compensate the people particularly affected out of the economic surplus thereby generated. The guiding principle is the "proactionary principle" proposed by Max More, which according to Fuller should replace our currently dominant policy of precaution.

Fuller's approach is top-down and holistic on the purely epistemic side, too: He interprets current events by placing them in the context of the entire Western intellectual and social history, viewing today's events as recurrences of characteristic historical patterns, and projecting the future from trends in the past. This gives him an optimistic outlook on the climate challenge: The record of Western thought is replete with prophecies of the coming end of the world, but history also shows that the doomsday prophets were always wrong. Fuller concludes that the same will transpire with respect to the current predictions of catastrophic global warming.

We may note in passing that Fuller's critique of doomsday predictions based on their poor track record should appeal to those who hold that epistemic procedures must pass an empirical reliability test. Fuller's approach featured a naturalistic component from the outset, although his preferred empirical domain, history, is somewhat unusual for an anglophone student of science.

There is a standard critique of the method of trend projection, however, due to Karl Popper: The mere extrapolation of trends and historical patterns lacks evidential weight, unless we can identify causal mechanisms underlying the observed regularities. Hence, Fuller owes it to us to identify the benevolent mechanism that has helped us out of trouble throughout human history. Fuller does not explicitly address this Popperian critique, but his writings suggest that he would counter it with another Popperian tenet, namely Popper's

indeterministic metaphysics as presented in *The Open Universe* (Popper 1982) and elsewhere: Human society is not a deterministic system, driven by causal mechanisms beyond our influence and before which we simply have to bow. Rather, it is an *open system* of which we ourselves are a part, and which we shape from the inside by our decisions and actions. Thus, the historical record of mankind's repeated escape from disaster does not result from some deterministic social mechanism, nor from sheer luck, but from man's ability to mobilize the ingenuity and resources required by the "logic of the situation" (another Popperian catchword)—especially when his survival depends upon it. The future of mankind is basically open, and when we extrapolate past trends, they do not point out an inescapable destiny but line up *alternative scenarios* between which we can choose, if we are willing to do what it takes to realize them. (Cf. Fuller 2018).

### **COVID-19 and CSE**

The COVID-19 crisis of 2020 provides a good illustration of Fuller's point. During the outbreak of the pandemic, politicians and health service officials in countries around the world would go on television on a daily basis to inform about the situation. Invariably, two graphs would feature in their presentations: A pessimistic one, showing a steep spike of casualties large enough to overwhelm hospital capacity, and an optimistic one featuring a flatter curve that could be managed by the health system. To the constantly repeated question from journalists as to which one would come to pass, health officials would return answers that basically boiled down to this: *It is really up to us—that is, to you, the viewers*. The curves show *scenarios*, that is, alternatives between which we can choose, not a future already lying in wait for us, although we do not yet know what it will be. If you viewers stick to the preventive measures that have been announced by the experts, you can secure a tolerable future for yourself; if not, chaos will ensue.

Fuller thus addresses the issues of social epistemology at the level of social theory and political philosophy from the outset. To him, it is basically a matter of choosing the right way to organize the societal production and distribution of goods, notably including such goods as educational opportunities and access to reliable information. The preferred policy would take into consideration both the efficiency of knowledge production and the fairness of its distribution. To Fuller, there is no opposition between the two, as he believes that knowledge is more reliably produced through a society-wide effort involving both lay people and specialists, than by a narrow elite of experts. Fruitful interaction between lay people and experts would be facilitated, by the way, by the efforts of a third figure, that of the *public intellectual*. This is a role that Fuller has enthusiastically sought to play.

Fuller has great confidence in the general public's ability to grasp complex scientific issues, as long as they are presented in a suitably non-technical manner. The COVID-19 pandemic should give us pause, however. It has stress-tested the ability of different political systems, including liberal democracies, to produce, absorb and utilize scientific information. In most countries, the general public did eventually acquire a sufficient grasp of the key aspects of this very complex challenge. There were unfortunate obstacles, however, at the level of governmental information policy. In the two most important players on the international

scene, China and the USA, governments either withheld information from the population and only released it when it could no longer be suppressed, as people began to fall ill in every neighbourhood, or mixed it with large doses of misinformation. Unfortunately, at this stage extensive human suffering and massive economic losses could no longer be avoided. In China, medical specialists and early whistle-blowers were muzzled, while in the US the warnings from experts were initially drowned out, and later on obfuscated, by the din from the White House spin machine. The situation was exacerbated by the way that, in both of these countries, the population had gradually been conditioned to view scientific findings through a political lens.

If the pandemic is viewed as a sped-up dress rehearsal of the looming climate crisis, the prospects are gloomy. We are currently at the stage where unusual climate-related phenomena are noticeable in everybody's back yard, and the deniers and sceptics in the general population are slowly coming around to a more realistic view. The reassuring messages from climate denialist governments ring increasingly hollow. Other governments, which are past the denial stage and have grudgingly accepted the reality of the problem, still prefer to talk rather than act. Behind the scenes, there is already a tug-of-war going on about which sectors of society will carry what share of the inevitable burdens. The worry is, however, that while this struggle goes on, the political process is paralyzed, and whatever action is eventually taken will be too little and too late.

These events suggest that it would be naïve to put much trust in the ability of extant political systems, including democracies, to absorb scientific findings in time to avert serious social crises. Regardless of whether such crises play out on a short time scale—such as the COVID-19 pandemic, we hope—or on a long one, such as climate change, the political system seems always to lag a few but fateful steps behind. In any event, the COVID-19 pandemic deserves careful study by anyone calling themselves “social epistemologists.” It shone a critical light on the all-important interaction between science and politics in modern society. The crisis produced a rich trove of data on the way different political systems handled the collection and processing of data, their dissemination to the public and their transformation into political action. It offers an unexpected and unique opportunity to conduct a comparative, “reliabilist” investigation of social knowledge generation, such as it is recommended by Analytic Social Epistemology.

### **Bruno Latour Comes “Down to Earth”**

Pondering the socio-epistemic aspects of the climate crisis is not the privilege of those who officially label themselves as “social epistemologists.” There are other contributors who, however, typically approach the matter from other disciplinary angles, such as Science and Technology Studies or sociology of science. A prominent example is Bruno Latour, who has recently addressed the issue in a short book entitled *Down to Earth* (Latour 2018). This is a collection of articles previously appearing in the general press, and is thus aimed at the lay public. Latour, of course, is not afraid of taking on the role of a public intellectual, which is a highly respected figure in French social life. Regrettably, Latour's intervention does not hold any more promise than that of ASE and CSE.

Latour approaches the problem at the same level as Fuller, i.e. the macro-level of societal decision-making, also known as politics. This has been a recurrent topic of Latour's writings, with a special focus on the tug-of-war between scientific experts and professional politicians in policy-making. He has largely sided with the politicians and against science, especially against the tendency for science to be cast as a universal authority, dictating solutions to political problems. The polity Latour wants to empower is not the traditional one, however, but a version that has been through the trademark Latourian dissolution of binary opposites. What results would be a polity not only of people but also of things, including "things" generated by science. Science is similarly transformed in this process, so what Latour advocates is really a smooth collaboration between a new kind of polity and a new kind of science (roughly corresponding to what Latour calls Society 2 and Science 2 in *Pandora's Hope*).

The problem of climate change as addressed in *Down to Earth* is viewed as an instance of this basic conflict between science and politics. The book represents a shift in Latour's stance, however, prompted by three developments.

First, his growing frustration with recent national politics, in particular as it is conducted in the U.S. with Donald Trump's withdrawal from the Paris accord, a move for which he could whip up considerable popular support despite its negative repercussions for the world at large and for the U.S. itself. Latour attributes this to an effort of systematic disinformation of the general population.

Second, the realization that the main threat of science usurping political authority does not come from natural science, but from economics. Economists have recently been the main providers of technocratic solutions to societal problems, typically on the basis of a global agenda. This aggressive economic globalism has spawned a perverse form of localism, known as nationalism.

Third, the realization that strict localism will not work with respect to the climate crisis, which is a genuinely global problem, both in an economic and an ecological sense.

In *Down to Earth*, Latour seeks to overcome the struggle between globalism and nationalism by redefining the very dimension of which these positions mark the opposite end points. What results is a new axis orthogonal to the original one, with the term "Earth" defining a point on it that will dissolve the original opposition. Not surprisingly, the solution is claimed to lie in Latour's celebrated actor-network theory: We can handle the challenges of climate change by accepting nature as an *actant*, i.e. an active player in the game rather than a passive, inert resource for man's economic activities.

Unfortunately, Latour is very vague with respect to what his new "Earth order" would look like. Sceptics may feel that they have been told a charming metaphorical tale, but have been given little idea of what it amounts to in literal terms, and little instruction on how to bring about the promised transformation. It is hard to believe that the mere translation of the

phenomenon of climate change into actant talk will move those who flatly deny that there is such a thing in the first place. This is the kind of discursive manoeuvre that generates great excitement in academia but has little effect elsewhere. In fairness to Latour, it should be added that he has employed other, less esoteric means of communicating his message, including a much advertised multimedia show.

Ironically, Latour's efforts to redefine the contrast between "local" and "global" is undermined by his radically constructivist understanding of science. Latour constantly impresses two points upon us: First, that the theoretical entities of science are constructions that do not exist apart from the activities and practices—the *networks*—in which they are embedded. Secondly, that such constitutive networks are always local. There will always be small local differences between the networks sustaining (what would from a realist conception be considered) a unitary scientific discipline and its associated laboratory practices. According to Latour's extremely fine-grained and dynamic ontology, such differences amount to essential distinctions. With the change of networks comes a change in all of their constituents, including the items that form their subject matter.

The point may be demonstrated by Latour's famous analysis of the post-mortem of Ramses II's mummy, performed by French physicians in 1976, which concluded that the pharaoh died of tuberculosis (Latour 2000). Latour disagreed, insisting that the tuberculosis bacterium did not exist prior to (what is normally but incorrectly called) its "discovery" by Robert Koch in 1882. This event was actually the *construction* of the tuberculosis bacterium, *Mycobacterium tuberculosis*, or more precisely a *transformation* of an existing ancestor to this microbe. Koch created a new microbe, not in the sense of inducing genetic modifications in an existing species, but in the metaphysical sense that is implied by actant ontology. Latour adds that the bacterium may disappear again in the future, which does not mean that it will have been eradicated by medical science, but rather that science will have come up with a different aetiology for tuberculosis. This does not impugn the current existence of *Mycobacterium tuberculosis*, however. It does indeed exist now, as it has since Robert Koch brought it into existence in 1882, and it will continue to do so as long as medical practice is built around its assumed existence.

Latour's dynamic ontology is quite attractive, but it is dangerous when it comes to addressing a global crisis. The COVID-19 pandemic may once again serve to illustrate the point: According to a strict Latourian ontology, there is no global crisis afoot, since there is no such thing as the coronavirus: what is incorrectly so called is a lineage of microbiological actants that undergo metaphysical mutation whenever they enter a new country and a new health care regime, producing a different organism. This analysis would undermine any unified global response to the challenge if it were taken literally, as it would preclude national health systems from learning about the characteristics of the virus—its lethality, incubation period, etc.—from the nations that were hit by the epidemic earlier on. Such inductions would be invalid. By contrast, they would be allowed on the basis of a traditional ontology, which would recognize that the different national health systems were fighting the same pathogen and could learn about its characteristics from each other. This would still leave plenty of room for alternative ways of handling the problem locally, depending on different

political systems, social traditions and the availability of resources—as has actually been the case in the COVID-19 pandemic.

This case illustrates a general implication of Latour’s writings, if we take them literally (which is not the recommended reading strategy).<sup>3</sup> They undercut the familiar formula for handling global challenges, i.e. “think globally, act locally”. On a literal reading of Latour, there is really no such thing as “global thinking” since thinking will always be distributed across a space of local practices that will break it up, producing a patchwork of local modes of thinking instead; “thinking” is just an actant and thus a (local) component of a local network. In other words, the global coordination that is called for in response to global challenges would be dissolved from the inside. No doubt international climate policy may receive some impetus from Latour’s efforts, but one must hope that it will not be based on a literal reading of his works.

### **A Lesson Learned?**

The relationship between politics and science is a focal topic of social epistemology, and was a key concern for Science and Technology Studies from the start. What was seen by many philosophers of science, and by some scientists, as the declaration of a war on science in the 1980’s, was rather an effort on the part of Science and Technology Studies to strengthen popular influence on the direction of scientific research, and on the practical use of its results. In particular, there was opposition to what might be termed the *generalizing fallacy* in society’s attitude to science, manifesting itself on two points.

First, in granting *general* political authority to prominent scientists irrespective of their precise area of expertise, instead of consulting specialists in the areas of concern.

Second, in going for *general* technocratic solutions to societal problems, often of a reductionist, monodisciplinary character, rather than making room for local solutions drawing on local knowledge about local conditions—in consultation with selected specialists from many disciplines. Today, as the dust of the Science Wars has long settled, some of these concerns have become part of the mainstream under such names as “citizen science”.

The reflections in the previous parts of my article may suggest a formula for the relationship between politics and science, as a reinterpretation of the slogan of “think globally, act locally.” It would give the international scientific community a wide rein in the domain of general theory building—this is global thinking—but would strengthen local control of its application. Such applications should be shaped in conformity with local conditions and local interests. Scientific thinking would be global in the sense of inviting input from all sources, and in aiming at a common conclusion; local “truths” should not be tolerated (this is somewhat akin to the “Universalism” of Merton’s celebrated CUDOS-norm). “Act

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<sup>3</sup> The most fruitful approach to Latour is to take him seriously but not literally. This is the stance tacitly adopted by most of his followers, and it has generated much interesting work in the discipline of techno-anthropology, and elsewhere. On the other hand, Latour’s critics from the time of the Science Wars and until today have insisted on taking him literally but—as a consequence—not seriously.

locally”, on the other hand, means that the common insights should be put to use in local practices that would be allowed to differ, with principles and remedies adapted to local conditions and concerns.

This is not a return to the discredited conception of science as moving linearly from tentative hypothesis to established doctrine whilst proudly resisting all external influence along the way, with application following only afterwards as a separate stage. The feedback loop between theoretical development and practical application is fully granted, and it is particularly tight within the social and human sciences as producers of “social technologies.” Rather, the point is a normative one, to the effect that all relevant feed-back from applications should be taken into account equally and, if negative, should result in general adjustments to the theory, not in local *ad hoc* tinkering.

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