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SCIENCE IN A NOT SO WELL-ORDERED SOCIETY:
A PRAGMATIC CRITIQUE OF PROCEDURAL POLITICAL
THEORIES OF SCIENCE AND DEMOCRACY

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1. Changing relations between science, politics and society

A look at some recent debates on science and technology in liberal democracies, for example those concerning the possible health risks of cell phones and the dangers of radiation posed by Universal Mobile Telecommunication Systems (Bröer, Duyvendak and Stuiver 2010; Bröer and Duyvendak 2010), the effectiveness of vaccination campaigns (Lips 2011; 2010), and promises of shale gas (Metze 2013), easily leads to the conclusion that either citizens have lost all their trust in science and technology or that today's experts and policy-makers are doing a lousy job. Technological applications, but also scientific knowledge itself – as in the case of climate change (Oreskes and Conway 2010) – are highly contested today.

However, there is an incongruity here. What exactly is at stake in the present situation? Surveys still show a high degree of public trust in science *in general* and an overwhelming number of technologies do *not* give rise to public controversies, although their risks, costs and social consequences are far from undisputed (Tiemeijer & de Jonge 2013; Dijkstra & Hagendijk 2011; Eurobarometer 2010; Eurobarometer 2005). So what is the case if 'trust' and 'reliability' are not the issue?

This paper does not claim that 'there is something rotten in the state of science' (although I cannot rule out that this is the case), nor does it state that people have become increasingly skeptical or even cynical about science. Instead, it studies how the relationships between science, politics and society are reformulated in current debates in liberal democracies. In order to do so, it evaluates these relationships from different theoretical points of view: on the one hand, a concept which holds democracy mainly as a mechanism to arrive at legitimate and justified decisions; on the other hand, a concept which emphasizes the continuously changing societal and technological conditions under which democracy has to be re-established.

The starting point for this discussion is a critical reading of Philip Kitcher's *Science, Truth, and Democracy* (2001) and his subsequent *Science in a Democratic Society* (2011). The thesis that will be put forward is that procedural democratic approaches to issues concerning science and technology are not sufficiently equipped to do justice to the *transformative nature* of the issues mentioned above. This transformative nature concerns the meaning these issues are given and conversely the epistemological and social consequences these issues have. Issues such as shale gas have both an epistemic and a political and social dimension. Not only do they give rise to tensions between science and politics in terms of diverging public and private interests and uncertainties on various levels, but they also lead to the formation of new groups of people, 'coalitions of unusual suspects' consisting of concerned citizens, activists, lay experts, local companies and NGOs, whose unlikely association in turn affects the nature and content of the debate. As a result, these issues do not only challenge current scientific insights but also affect the existing social order.

Who are these people whom the sciences ought to be concerned with? Which notion of democracy correctly takes group formation under conditions of scientific and technological uncertainty into account? Is it possible to develop a notion of politics that takes epistemic issues into consideration? And a notion of science that is sensitive to its place in society?

This paper proposes that an answer to these questions ought to be formulated within a more substantive understanding of democracy than the procedural concept allows for, and that the political theory of classical pragmatism offers valuable insights for doing so. I will not claim that a fully substantive account of democracy ought to be embraced. Instead, the aim of this paper is to show that classical pragmatism leads to a kind of middle ground between procedural and substantive notions of democracy. As such, it is supposed to do justice to the transformative nature of the issues mentioned above.

I will develop my argument in the following steps. I will start with an analysis of a proposal by Kitcher (2001) to arrive at a kind of ‘well-ordered science’ to fuel the interaction between science, politics and society. Thereafter I will debate some of the presuppositions of Kitcher’s scheme by pointing out that his most recent (2011) defense of well-ordered science rests on a quite narrow interpretation of the implications of a pragmatist theory of democracy. I will then claim that Kitcher’s model is in need of a more radical reading of some specific notions of pragmatist thought that will lead to a better understanding of the tensions between science, politics and the public. In order to do so, I will contrast Kitcher’s ‘well-ordered science’ with Dewey’s notion of ‘inquiry’. In addition, I will clarify that a pragmatist political theory aims not just to represent or unify the existing political community but to extend that community to new groups and new domains. Key to this is the notion of ‘publics.’ Finally, I will explain that pragmatist political theory emphasizes the transformative nature of publics and their environments. Crucial to this understanding is the notion of ‘experience’. Neglecting this element of the theory means missing the content of this problem-based approach. The paper ends with a concluding section.

2. Well-ordered science

‘What is the role of the sciences in a democratic society?’ With his opening sentence of *Science, Truth, and Democracy* (2001), Philip Kitcher makes clear that his concerns as a philosopher of science are not restricted to questions of a formal kind. In his subsequent work, *Science in a Democratic Society* (2011), he explained that his worries come from two sides. On the one hand, he is concerned about the erosion of scientific authority: ‘a variety of challenges to particular scientific judgments has fostered a far more ambivalent attitude to the authority of the natural sciences’ (2011: 15). On the other hand, he is concerned about the social embedding of science: ‘...the tangled relations now evident between Science and social decision making...call for philosophical attention’ (Kitcher, 2011: 155). What we urgently need is:

‘[...] a theory of the place of Science in a democratic society – or, if you like, of the ways in which a system of public knowledge should be shaped to promote democratic ideals.’ (Kitcher, 2011: 26)

I will claim that the ideal of a ‘well-ordered science’ that Kitcher proposed in both books as a theory of this sort is too narrow a concept to combine science and democracy and that it fails to do justice to the social ontology that surrounds current issues. His subsequent shift (2012; 2011) to the political theory of the American philosopher John Dewey is promising in that respect but still neglects some important elements of classical pragmatism that emphasize the mutual interaction between science, democracy and society.

The starting point for my discussion is Kitcher’s emphasis on ‘significant truths’. Elaborating on a specific treatment of scientific realism and objectivity, Kitcher claims that the status of scientific theories and facts is epistemologically justifiable, but that there are no scientific grounds for pinning down the direction of research programs (2001, Ch. 6; 2011, Ch. 1). Kitcher takes ‘moral and social values to be intrinsic to the practice of the sciences’ (2001: 65) because the organization of every research program demands not only theory-construction on a more general level in order to arrive at a certain degree of coherence, but also many practical deci-

sions to be taken and priorities to be set. The course of research programs is for a large part an historically and socially contingent process which is not led systematically by ‘context-independent goals for inquiry’ (2001: 73). The implication is not that ‘the history of science should be viewed as a sequence of irrational transitions’ (2011: 35). Rather, it is that decisions about the course of science ‘cannot be reduced to simple formalisms’ (2011: 36). The conclusion that can be drawn from this is that it is questionable whether the sciences can be hierarchically unified and whether integration within a single unified framework is possible (2001: 71). Of more importance for the discussion here is the conclusion that the agenda for scientific research cannot be formulated solely on scientific grounds. Science cannot set its own agenda scientifically *in a significant way*.

This conclusion creates opportunities for a more comprehensive account of agenda-setting in which the course of scientific inquiry is determined by a variety of parties, interests and considerations. However, Kitcher is reluctant to support a kind of stakeholder democracy of science (e.g. Latour, 2004) in which co-construction is the aim and participation in science by laypersons or the public at large becomes an end in itself. To him, ‘vulgar democracy is a very bad idea’ (2001: 117). Instead, he advocates what he calls a division of epistemic labor (2011: 25) and sketches an ideal of ‘enlightened democracy’ (2001: 133-134) as a middle ground between the pure democratic model of epistemological equality and the expertocratic model of an elite of experts.

At first glance, Kitcher’s proposal is a perfect example of what Latour (1993) has called the ‘modernist divide,’ a separation of tasks and responsibilities between science and politics. Politics is concerned with power and will-formation, it is aimed at decision making, and its final task in a democratic society is to attribute responsibility: the governors are accountable to the governed. Science, on the other hand, is concerned with truth, it is aimed at research, and its task is to arrive at rational, independent, more or less objective descriptions and explanations of social and natural phenomena. In the end, this division of labor boils down to a strategy of ‘purification’: both sides have to be protected against contamination to prevent irrationality and irresponsibility.

However, ‘well-ordered science’ is not a convenient scapegoat and the ideas behind it are too intelligent to be accused of naive modernism. Latour’s idea of the ‘modern constitution’ offers a telling but also somehow simplified image of the relationship between science and politics. In fact, it sketches a conceptual image of their relationship in rather static terms and does not offer many clues for understanding this relationship under more dynamic conditions, when mutual interaction and actual tensions between the two arise. Moreover, the divide is restricted to only two ‘powers,’ but it is easy to distinguish a few more, such as the media, the law, and economy/industry.

Kitcher focuses on the *interaction* between science and democracy and moves on to ask how the aims of scientific inquiry should be determined. With his focus on interaction Kitcher leaves the boundaries between science and democracy untouched and refrains from an analysis of real existing or imagined practices in which these (elusive) boundaries are contested or redefined. His suggestion (2001, Ch. 10; 2011, Ch. 5) is to come to a kind of ‘well-ordered science’. This proposal aims to combine an epistemologically realistic idea of science with a procedural and deliberative account of democracy that relies heavily on Rawls’ notion of ‘public reason,’ the common reason-giving of citizens in a pluralist society.

Kitcher proposes a three-stage cycle. In the first stage, representatives of groups in society deliberate about their preferences for scientific research. In this process of deliberation, they learn more about the preferences of other groups. This will result in a consensus, an agreement on how to accommodate their differences, or a vote about the issues that need to be investigated by academics. This result goes to scientific communities, whose role is to say ‘how’ these issues can be investigated and how probable significant results are. In this second stage, it is important to ask a diverse group of researchers to identify the probability of different scientific ventures succeeding. This would give the decision-makers, the representatives, a more balanced view of the possibilities of contemporary science. Just as they decided in stage one on the aims of scientific inquiry, they decide in stage three which projects to fund, based on the additional information given by researchers.

This method forces scientists to discuss explicitly the non-scientific consequences of their work. The current, arbitrary, foundations for deciding what lines of inquiry to follow could be replaced by a more ‘enlightened democratic’ foundation. According to Kitcher, this would not lead to better or more truthful science, but it would be more democratic and this would be an improvement on the current state of ‘elitism’.

In short, in the first stage, ideal deliberators, seen as representatives of civilians, make a scientifically informed choice as to what policies are worth pursuing. In the second stage, science develops possible scenarios to pursue the policies. In the third stage, the deliberators choose which scenario is most to their liking. The resulting policy would be the perfect combination of democratic preferences and scientific knowledge (Kitcher, 2001: 118-23).

Kitcher's ideal of Well-Ordered Science is instructive for several reasons. First of all, his epistemologically realistic image of science is likely to correspond with the self-image many scientists have of their profession. Second, as a philosopher of science Kitcher explicitly draws attention to the societal position of the sciences. Third, Kitcher tries to connect the position of the sciences to the demands of democratic decision-making.

Kitcher emphasized that well-ordered science is an ‘ideal’. However, this ideal resembles many real-life policy practices in which exactly the same order of things can be found. They start with public debate about a new problem, for instance the need for a vaccine. The next step is scientific advice to the government about the possibility of developing a vaccine. Parliamentary discussion then follows. Finally the process ends with a decision and execution of policy programs. So why does Kitcher describe his proposal as an ‘ideal’? He refrains from an evaluation of pre-existing decision-making processes, which come quite close to his ideal. Instead, his aim seems to be to further polish the theoretical underpinnings of his proposal.

3. The turn to pragmatism

In *Science in a Democratic Society* (2011), Kitcher repeats the main ideas of *Science, Truth, and Democracy* (2001), including his ideal of well-ordered science. Also included is an application of his theoretical framework to some examples, namely debates on the history of life and evolutionary theory, biomedical technologies, genetically modified organisms and climate change (2011, Chapter 9, ‘Actual Choices’). Theoretically, one of the main differences between the two books is that in the latter, Kitcher explicitly grounds his concept of democracy on Dewey's thinking. Although Brown (2004) had encouraged Kitcher to take this direction, no reference to that suggestion is made. Neither does Kitcher explain why he considers a more elaborated idea of democracy necessary or in which respects his new ideas differ from his former ones.

Despite these lacunae, his turning to Dewey makes perfect sense. Key elements of Dewey's ideas are the emphasis on the political significance of science and technology and the inseparability of democracy and education, the value of democracy as a culture and as a way of life rather than as a set of formal political institutions, his relentless attention to the primacy of the method, both in science and in democracy, and a continued focus on consequences rather than principles. With respect to re-thinking democracy and the place of the sciences in modern societies, Dewey's work can be regarded as ‘political theory’. The development of a political theory implies the attempt to formulate a coherent network of concepts and abstractions to investigate specific current issues in society (Wolin, 2004: 504). ‘Political theory’ differs in structure from both political philosophy and political science. Where political science focuses on the empirical field of ‘politics,’ political theory is engaged with the meaning of ‘the political,’ as it can also manifest itself beyond the practice of conventional politics (Mouffe, 2005: 8). In contrast to political philosophy, political theory can be seen as an attempt to conceptualize ‘the political’ by addressing specific political issues instead of taking classical political-philosophical issues as a guide.

How much does Kitcher take from this? Is he satisfied with some of Dewey's more modest proposals to make democracy more ‘intelligent’? Or is

he prepared to read Dewey in a more radical way and to see Dewey in opposition to many mainstream ideas of what democracy is all about? If one hopes for the latter, the start is promising. Kitcher regards the voting concept of democracy quite inadequate and states firmly that 'the existence of elections and of majority rule is not constitutive of democracy. Often, these serve as the expression of a deeper idea, that of popular control. Nevertheless, they may not even be *expressions* of that idea but *betrayals* of it' [original emphasis] (Kitcher, 2011: 65). Climate policy is one such example. According to Kitcher (2011: 128) climate policies are hijacked by short-term wishes such as maintaining the usual energy consumption to the effect that democracy fails to represent the interest of the people (i.e. political action to prevent harm and to mitigate the consequences) but focuses on various misguided preferences instead. He therefore agrees with Dewey that 'democracy is more than a form of government' that it is 'primarily a mode of associated living' and that it is concerned with 'a way of life' (Kitcher, 2011: 69-70). According to Kitcher, Dewey connected freedom to self-realization and stressed both the need for positive freedom as well as for certain levels of protection (2011: 70). As a consequence, Dewey's idea of democracy is perfectly suitable for addressing what Kitcher considers to be one of the major problems of contemporary societies, namely 'the problem of *unidentifiable oppression* [original emphasis], where the limitations on freedom are either not felt, or, if felt, are difficult to trace to their source because no single agency is involved' (Kitcher, 2011: 78).

To prevent such oppression in general and to mitigate negative consequences of science and technology in particular, he proposes that science, and the public system of knowledge in which it is embedded, serve the purposes of citizens of a democratic society by way of 'investigation'. Soon, however, it turns out that the idea of 'investigation' has little to do with the kind of joint problem-solving or co-production of knowledge that has drawn ample attention in, for instance, the fields of Science and Technology Studies and Policy Analysis. Instead, it is to be understood in the more narrow meaning of 'responsible decision making' (Kitcher, 2011: 114). As a result, Kitcher's reading of Dewey's political theory is in line with the widespread view that holds Dewey as a deliberative democrat *avant la lettre* (e.g. Bernstein, 2012).

Central to deliberative democracy is the idea that a system of elections to represent citizens preferences ('votes') is not sufficient to arrive at reasonable legitimate grounds for binding collective decisions. Instead, broader support based on shared argumentations ('voices') is vital to an inclusive model of democracy, which has collective will -formation at its center.

This ideal, however, faces some serious constraints. The scale of contemporary democratic nation states, the transnational nature of many issues, the complexity of the problems and the difficulty of arriving at consensus put limits on the feasibility of deliberative processes. In practice, therefore, deliberative processes come not as an alternative but in addition to representational democracy. They are mainly focused on specific topics and include selections of stakeholders.

The same is the case in Kitcher's account. But this gives rise to fundamental questions. The range of people involved in debates and the energetic and emotional nature of controversies in today's media culture have given rise to some criticisms of the ideal and practice of deliberative approaches to democracy. His approach will have to clarify what kind of framework should be used to decide who are appropriate participants in collective decision-making processes. It needs to point out what arguments can be used in favor of, or against, including representatives in the policy-making process (Shapiro, 1996: 233-234). In addition, it will have to formulate criteria for deciding what means of persuasion are legitimate in the deliberative process (Nussbaum, 2001). Such an approach has to be careful not to overestimate the possibility of certain groups with a less-developed social position to transform themselves into active citizens (Young, 1997: 60-75). Science's authority is put to the test in media cultures and the unpredictable dynamics of social media affect political and scientific communities (Hajer 2009). Under such conditions both moral as well as epistemic authority has to be co-produced in mutual interaction (Brown 2009). 'Who is entitled to speak on which topic and who is granted the authority to do so' and 'who is entitled to act on behalf of the people and who is in the legitimate place to do so' are questions that remain to be answered.

At this point, one would expect a reaction from Kitcher, because clearly a choice has to be made: either he regards himself as a deliberative democrat and comes up with a defense against these accusations, or he holds that pragmatist political theory purports something quite distinct, or at least proposes a specific version of deliberative democracy and makes this more explicit. Kitcher implicitly chooses the former and replies to these criticisms with mere practical considerations. However, these criticisms of pragmatist political theory demand a more fundamental reply to the following: does pragmatist political theory essentially consist of a procedural or a substantive account of democracy?

Kitcher neglects this question. Its urgency, however, is emphasized by Talisse (2007) who stressed that substantive interpretations of pragmatism may be incompatible with pluralism in some respects. Talisse's analysis is based on the well-known distinction between 'procedural' and 'substantive' accounts of democracy, the first being a notion that regards democracy as a process for arriving at collective will-formation and decision-making in a legitimate and justified way, and the second claiming that democracy demands something 'stronger' and 'deeper' such as a shared idea of what it means to be a citizen, to have rights, to live in freedom, or even a common agenda to broaden the project of democracy to less empowered groups. Or, as Rosanvallon (2011: 4) has described the two positions, on the one hand we have an account of legitimacy based on social recognition of some kind of power, and on the other hand an account of legitimacy based on conformity to some norm or system of values.

The merit of the procedural notion of democracy is that it allows for the inclusion of a variety of perspectives in decision-making processes and refrains from a substantive account of what democratic outcomes ought to be. Conversely, from the perspective of this approach substantive accounts of democracy run the risk of being incompatible with pluralism and as such with the kind of freedoms defended by Dewey and Kitcher. To Talisse (2007), Dewey's particular comprehensive doctrine is even oppressive, since it 'unavoidably involves the coercion of reasonable persons to live within civic and political institutions and structures that are organized around a comprehensive moral vision of human flourishing that they could reasonably reject' (Talisse, 2007: 46).

Kitcher does not attempt to answer this accusation. By neglecting it, the suggestion is made that a pragmatist political theory is only viable in a procedural sense. In the following, two objections will be raised which may counter the aforementioned accusations. The aim is to show that pragmatist political theory offers more substance than Kitcher's reading allows for and that a more substantive interpretation of pragmatism does not need to end up in republican theories or in communitarianism. I will build up my argument in two subsequent steps. First I will introduce Dewey's notion of 'inquiry' as a much more comprehensive attempt than Kitcher's 'well-ordered science' to integrate the methods of science with those of democracies. I will clarify that pragmatist political theory aims not to represent or unify the existing political community but to extend that community to new groups and new domains. Key to this objection is the notion of 'publics'. Thereafter, I will explain that pragmatist political theory emphasizes the transformative nature of publics and their environments. Crucial to this understanding is the notion of 'experience'. Neglecting this element of the theory means missing the content of this problem-based approach.

4. Inquiry and the coming-into-being of publics

Dewey's ideal of fuelling democracy with intelligence was more ambitious than Kitcher's ideal of 'well-ordered science'. It may have been a bit naïve in that it had some blind spots for power relations but it certainly aimed at much more than arriving at legitimate decisions. Central to Dewey's philosophy is his notion of 'inquiry'. In *Logic, The Theory of Inquiry* (1938), he explained this idea:

'Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole.' (Dewey, 1938: 104)

When Kitcher (2012) reflects on this notion in his lecture *The importance of Dewey for philosophy (and for much else besides)* he regards it as similar to what he now calls his ideal of ‘well-ordered inquiry’. Kitcher rightfully points out that crucial to the notion of inquiry is the presupposed ‘we’ that will conduct it. He agrees with Dewey that this ‘we’ is a fiction. However, as I will suggest in the following, Dewey’s idea is not just to restore the collective nature of the democratic project but to redefine it altogether into a search for the fragmented public. Contrary to this, Kitcher strives to combine Dewey’s broad democratic ideals with a procedural account of democracy aimed at decision-making that is simply too narrow to do justice to the full implications of pragmatist political theory. However, Dewey’s position is clearly distinguished from those who consider science as merely a puzzling or *scientific* problem-solving activity separated from politics or from societal tasks. To Dewey, science begins *in medias res* and takes a situation that is ‘disturbed, troubled, ambiguous, confused, full of conflicting tendencies’ as its legitimate starting point. In order to so, he broadens the task of the sciences by redefining its methods. Instead of emphasizing the differences in aims and methods of science and democracy, Dewey sees a close resemblance between the two when it comes to the iteration between means and ends.

This point of view has been criticized for paying little attention to questions of power and passion. Wolin (2004), for instance, has criticized Dewey for identifying democracy ‘with a method of discussion that assimilates it to science, while science is consistently described in communal terms that make it appear naturally democratic’ (Wolin 2004: 517). In other words, by comparing science to democracy and democracy to science, Dewey leaves out important elements of both and reduces them to a ‘method’. In addition, this method has been described as a ‘process without purpose’ (Diggins 1994) and as offering ‘unjustifiable social hope’ (Rorty 1999) because in the end it would lack a clear direction and an ideological horizon. Instead, I will argue that Dewey’s political theory may lack sensitivity for power relations, but that it is passionate through and through by being infused with a strong desire to accommodate technological societies with an appropriate notion of democracy. In that sense, I will follow Brown (2009: 153) in that ‘despite common misunderstandings, Dewey’s notion of inquiry as purposive interaction goes beyond a rationalistic, in-

strumental understanding of science, and as part of human experience in general, is a fundamentally passionate and moral enterprise.’

Particularly in the period 1920-1950, Dewey was driven by the question of how to explain to the American people that a proper organization and use of science and technology can contribute to the intellectual and moral development of society and of citizens (Russil 2005; Wolin 2004: 504). Science, technology and industry determined the new face of the American society at the beginning of the twentieth century as it finally pulled into the machine age. Dewey emphasized the self-realization of people. Self-realization can come about when people create relationships with their environment, similar to the way in which Woodrow Wilson talked about The Great Society at that time as ‘a new era of human relationships’. Scientific and technological developments are not seen by Dewey as a ‘danger’, but judged on their capacity to make new viable linkages. This idea turns out to be fertile ground for redefining democracy.

Democracy is, in the famous words of Abraham Lincoln, ‘the government of the people, by the people, for the people.’ The sovereignty of free citizens is thus reflected in their reconcilability in a political ideal. This phrase aptly illustrates the idea behind the democratic project, but the question is *how* the people can be brought together in this ideal and *what* their connectedness consists of. Today’s networks of roads, housing and wiring are not just the cement of society because they make available the facilities along which normal human traffic can take its course. Scientific and technological developments transform the social contexts in which people find themselves. They establish the relationships that bind them again for discussion.

In Dewey’s pragmatist political theory as formulated in *The Public and Its Problems* (1927), democracy is neither based on a ‘collective,’ nor grounded on the protection of ‘individual’ rights or interests. Instead, he proposes an approach in which the size and scope of political issues should be determined. Dewey is interested in the effects of new problems. The ‘people,’ the demos, is a phantom, a ghost, which has to be discovered. Dewey spoke of ‘the eclipse of the public’ which seemed to be lost and bewildered. It is not a given, but depends on the issue at stake. To allow for the

changeable nature of the various groupings that shape society, Dewey introduced a different view of *who* the *demos* or the relevant communities are in a democracy. Instead of the demos, or the people, he speaks of *the public*.

From this view, politics is not primarily a matter of a community of people who consult one another, but a thing that arises from the fact that private actions and transactions may affect strangers who are not directly involved in those transactions or transaction consequences. In his famous definition, he stated that 'the public consists of all those who are affected by the indirect consequences of human action' (Dewey, 1927: 15). The public is not an a priori notion but something that comes into being a posteriori.

This notion of the public is neither a liberal nor a republican or communitarian one. It breaks with the individual nature of the former and with the notion of the common good in the latter. As such, the notion offers an opportunity to break with the aforementioned dichotomy between procedural and substantive accounts of democracy. A promising way to arrive at a middle ground between these diverging ideas has been offered by Shapiro (1996). Shapiro distinguished between three notions of democracy, the first having to do with principles of democratic governance, the second with the underlying metrics of value, i.e. with which principles of justice are applied, and the third with ways for advancing democratic principles in everyday life. The first notion entails a substantive account of democracy, the second a procedural account, and the third emphasizes the importance of a certain 'method' which makes democracy viable in everyday life.

The advantage of adding the third perspective is that it breaks down the stalemate position between the first and second option. Proponents of a substantive account of democracy criticize the procedural account for being empty and focusing solely on questions of redistribution. It is accused of having a blind spot for already existing power relations and inequalities and for refraining from doing justice to all kinds of minorities and immaterial claims. Conversely, proponents of a procedural account of democracy question the idea that there is some way, independent of

what democratic procedures generate, to determine what outcomes are genuinely democratic.

The third perspective somehow offers an alternative by shifting the attention to the question of *how* political innovation is to be arrived at. Neither the first nor the second option suggests how a political philosophy, whether it is a substantive or procedural one, can relate to the social world, i.e. how one can aspire to its ideals under the constraints of social reality. This leads Shapiro (1996: 130) to say that 'designing democratic institutional constraints is inevitably a pragmatic business, best pursued in a context-sensitive and incremental way'. He supports this statement with three reasons. First of all, democratic maps of an uncultivated social terrain are bound to run aground when the sheer complexity of social life is not taken into account. Second, any procedure ought to be open to various kinds of initiatives of self-organization in order to allow people 'to discover ways to democratize things for themselves'. Third, thinking in terms of systems and blue-prints leads to a state-centric view of politics. As a result, Shapiro (1996: 123) typified his desired account of democracy as 'more than process, less than substance'.

Dewey's account of democracy, however, is much more than 'a way out' in a solidified philosophical debate. It opens up an innovative point of view on social dynamics and the interaction between people, politics, science and technology. To grasp this dynamics, it is important to emphasize that in Dewey's account the distinction between the public and the private does not coincide with that between the social and the individual. A social action has a private character as long as the consequences do not transcend the stakeholders involved. In contrast, an individual act can be of a public nature because the consequences relate to people who were not initially taken into consideration (Dewey, 1927: 12-14). He thus speaks of the public as an effect of unforeseen consequences. Technologies, whether they are the industrial powers of the "machine age" or today's information technologies, connect humans and machines, or (as Latour would say) 'humans and nonhumans,' and shape associations of people, a 'community of the affected' (Marres, 2012: 43). These publics are not pre-existing groups of people, but come into being as constructed assemblages.

5. Experience as democratic energy

The second distinctive feature of pragmatism that is important to stress is the notion of ‘experience’. The dynamics of current debates concerning science and technology are hard to grasp when their emotional and energetic nature is not taken into account. Not because people today are over-excited or because the media focus only on scandals and hypes, but because the very relationship between people’s expectations, political decision-making and the course of scientific research and technological innovation is driven by a ‘political economy of hope’ (Rose 2001). Contrary to Kitcher’s ‘rationalized’ reading, this notion of experience is central to classical pragmatism. It does not only have psychological meaning but democratic consequences as well. Moreover, the notion of experience is crucial for understanding the *transformative nature* of issues in which publics are related to questions of science and technology.

In his essay *On a Certain Blindness in Human Beings* (1899), William James famously described how certain events, such as crossing Brooklyn Ferry, connect people to one another. James himself once wrote that the piece contained ‘the perception on which my whole individualistic philosophy is based’ (Richardson, 2012: 145). In a poetical way, with many references to Robert Louis Stevenson, Wordsworth, Whitman and others, James argued that doing things together unites people and transforms strangers into what is now called a ‘community of fate’. Experiences blur the boundary between the individual person and the social group. This notion of ‘experience’ is also central to Dewey’s thought. To Dewey, experience is a path into the world. In *The Need for a Recovery of Philosophy* (1917), he explained that in the following way:

‘Experience is primarily a process of undergoing; a process of standing something; of suffering and passion, of affection, in the literal sense of these words. The organism has to endure, to undergo, the consequences of its own actions. [...] Undergoing, however, is not mere passivity [...]. Our undergoings are experiments in varying the course of events; our active tryings are trials and tests of ourselves.’ (Dewey, 1917: 49)

As such, experience allows for a specific relationship between humans and nature, between the inside and the outside world. It is not ‘a veil that shuts man off from nature’ but ‘a means of penetrating continually further into the heart of nature’ (Dewey, 1925: 4-5).

In the revival of pragmatist philosophy in the 1980s and 1990s, most notably in the works of Hilary Putnam and Richard Rorty, this notion of experience was concealed behind a somewhat analytic and linguistic interpretation of classical pragmatism. In addition, Putnam and Rorty have put more emphasis on the epistemological aspects of pragmatism than on the political theory, although Rorty’s later works, especially *Achieving our Country* (1998), may count as an exception. Kloppenber (1999), for instance, remarked that:

‘[...] the early pragmatists emphasized ‘experience,’ whereas some contemporary philosophers and critics who have taken ‘the linguistic turn’ are uneasy with that concept. [...] Language was thus crucial for understanding the experience of others, but for James and Dewey language was only one important part of a richer, broader range that included interpersonal, aesthetic, spiritual, religious, and other prelinguistic or nonlinguistic forms of experience.’ (Kloppenber, 1999: 86-87)

Recently, some authors have related this notion of experience in classical pragmatist philosophy to its political theory in more explicit and lively ways (Livingston, 2012; Ferguson, 2007). Dewey’s theory offers many clues but James’s is more complicated, one reason being that it remains debatable whether James actually developed anything like a ‘political theory’. Attempts to reconstruct James’s political theory often take his ‘radical pluralism’ as a starting point. The Great San Francisco Earthquake of April 18, 1906 is a good example of how a single event has very distinct consequences for different people and finally can even be regarded as a collective name for a ‘whole series of geological slippages, fractures, and vibrations that constitute seismic activity’ (Livingston 2012: 1). In *On Some Mental Effects of the Earthquake* (1987), James described how he was thrown face-first from his bed as the earthquake shook his bedroom ‘exactly as a terrier shakes a rat’ (Livingston 2012: 1). He reported:

‘Everybody was excited, but the excitement at first, at any rate, seemed to be almost joyous. Here at last was a real earthquake after so many years of harmless wobble! Above all, there was an irresistible desire to talk about it, and exchange experiences.’

Here it becomes clear how the notion of experience contains a democratic meaning in that it connects the coming into being of publics to their variable material environment. As such, the notion refers to the transformative nature of both publics and the issues they are confronted with. To James, the earthquake served as an emblematic example of how experiences both unite people as well as throw them back on themselves. On the one hand, the seismic event was a dreadful nightmare for everybody, leaving three thousand dead and a quarter-million residents homeless and hundreds of thousands in shock. On the other hand, the meaning and impact of the earthquake were different for many people and had varying consequences, so that the experience remained an individualistic affair in the end (Ferguson, 2007: 61). In a passage in Lecture 4, ‘The One and the Many,’ of his *Pragmatism: A New Name for Some Old Ways of Thinking* (1907), James described what he had in mind:

‘The world is full of partial stories that run parallel to one another, beginning and ending at odd times. They mutually interlace and interfere at points, but we cannot unify them completely in our minds.’ (James, 1907: 71)

Dewey certainly would not disagree, but to him there is more communality in experiences. This communality is achieved by following the transformation processes publics and their environments undergo. Creating common experiences from fragmented events is a task he explicitly attributes to science and philosophy and most of all to democracy itself. It ought to be central to a political theory of science. Neglecting the notion of experience impedes a substantive interpretation of democracy that emphasizes the mobilizing role of hopes and expectations and, most notably, the formation of new publics that are gathered together by the emotional energies of society.

6. Conclusions

Kitcher’s ‘enlightened democracy’, the three-stage process of well-ordered science, takes the place of ‘science in society’ into account and does justice to the idea that the sciences ought not to set their agenda in splendid isolation. However, Kitcher’s idea of democracy is mainly aimed at making justifiable decisions. Although he shifts from relying heavily on the political philosophy of Rawls’s in *Science, Truth, and Democracy* (2001) to following Dewey’s political theory in his subsequent work, *Science in a Democratic Society* (2011), his concept of democracy is a deliberative one in the procedural sense. The main criticism which has been brought forward here is that *from a pragmatist account of democracy*, this concept is too restrictive. Instead, classical pragmatism, most notably the works of James and Dewey, allows for a broader account of democracy.

Pragmatist political theory in general and Dewey’s ideas of democracy in particular have been the subject of much criticism. This varies from the accusation that Dewey’s mingling of the procedures of democracy with the methods of science into a thing called ‘inquiry’ leads to a kind of ‘social engineering’ to the fear that this inquiry is easily captured by private interests and is susceptible to the influence of self-assertive, well-organized groups (e.g. Zakaria 2003).

A viable reading of pragmatist political theory demands a stronger elaboration of the notion of ‘radical pluralism’ and the way scientific and technological developments both unite as well as divide people. Key to such an understanding are the notions of ‘publics’ and of ‘experience’. If one agrees with the pragmatist imperative that actions, including thought-acts and speech-acts, are to be judged by their consequences, a pragmatist political theory ought to be sensitive to the idea that it need not give *a priori* justifications for decision-making processes, but instead should focus on the consequences, i.e. on the *a posteriori* effects of science and technology. This is exactly what Dewey was aiming for with his notion of ‘the public’. The conclusion he arrived at was that unforeseen consequences lead to publics who have to be taken care of democratically.

Kitcher's 'enlightened democracy,' however, emphasizes the epistemic and procedural aspects of decision-making processes while neglecting public emotions and energies which are not unusual in the 'economies of hope' and the 'politics of expectations' (Brown 2003; Brown and Michael 2003) that surround scientific and technological promises, as in the case of biofuels, GMOs, shale gas or the development of new therapies and pharmaceutical drugs. Moreover, procedural approaches to democracy tend to neglect the substantive idea of 'experience' as a cornerstone for arriving at shared ideas and images. As such, they are blind to the political consequences of social-technological change, for instance the rise of groups of unusual suspects and the shaping of unlikely coalitions such as inhabitants, environmentalists, activists, water corporations and beer breweries in the case of shale gas, which led to 'pop-up publics'.

As Honneth (1998: 780) already concluded, Dewey's notion of democracy leads to a third road between 'an overethicized republicanism and an empty proceduralism'. Although Kitcher's procedural account is too narrow, pragmatist political theory differs from substantive concepts of democracy in that it is not primarily aimed at the formulation of the common good or a binding general will. Geuss (2001) therefore suggested that Dewey's democracy 'is not at all intended as a concept with application to the political system of a state, but as the ideal of a liberal community which, like ancient direct democracy, lacks state-structures' (Geuss, 2001: 127).

Perhaps the distinction between a substantive and a procedural theory is not the crucial issue here. If the goal of the distinction is mainly to arrive at some analytical clarity, replacing the dichotomy existing between procedural and substantive concepts of democracy for the more empirical distinction between representative and deliberative forms of democracy is a first option. In doing so, it becomes much clearer that despite the differences, pragmatist political theory is part of the 'deliberative family' which has a bare individualistic notion of representative democracy as its counterpart.

However, something more important is at stake here. The 'substance' of pragmatist political theory bears a different meaning of 'the political' alto-

gether. Pragmatism, I would claim, emphasizes the *transformative nature of reality* and regards both science and democracy as more or less collective enterprises aimed at 'inquiry'. Issues relating to science and technology will have to be investigated in a continuous iteration between means and ends to arrive at a viable place in society. This ought to result in the identification of publics who deserve special treatment because they are likely to experience the consequences of science, technology and related policy programs in a distinctive way. As such, pragmatist political theory exchanges the general idea of 'membership' of deliberative theory for a much more contextualized and partial account, not as a substitution for but as a supplement to the existing political community. Only when this element is fully taken into account, will a political philosophy of science and democracy based on classical pragmatism become viable.

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