



universität
wien

DIPLOMARBEIT / DIPLOMA THESIS

Titel der Diplomarbeit / Title of the Diploma Thesis

“The problem of climate change in Philip Kitcher’s
Science in a Democratic Society – A pragmatic critique”

verfasst von / submitted by

Andreas Spießberger

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Magister der Philosophie (Mag. phil.)

Wien, 2020 / Vienna, 2020

Studienkennzahl lt. Studienblatt / degree
programme code as it appears on the
student record sheet:

UA 190 299 344

Studienrichtung lt. Studienblatt / degree
programme as it appears on the student
record sheet:

Lehramtsstudium Unterrichtsfach Psychologie
und Philosophie Unterrichtsfach Englisch

Betreut von / Supervisor:

Univ.-Prof. Dr. Martin Kusch

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“I want you to act as if our house is on fire.
Because it is.”

--Greta Thunberg

LIST OF ABBREVIATIONS

CC	Climate change
GHG	Greenhouse gas
GMO	Genetically modified organism
IPCC	International Panel on Climate Change
SDS	<i>Science in a Democratic Society</i>
SPK	System of Public Knowledge
STD	<i>Science, Truth, and Democracy</i>
UNFCCC	United Nations Framework Conference on Climate Change

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1 Introduction

1.1 Research interest

The predicament of climate change (CC)¹ and several key problems for this thesis in the philosophy of science are perfectly represented by the statement that “[c]hoices will govern which pathway is followed” (Clarke et al. 2014: 420). The passive construction is one of the most defining grammatical characteristics of objectified scientific discourse. Yet, there is no choice without a subject, and no rational choice can be made without scientific insights into such a complex issue. The lack of hedging suggests certainty that these pathways are reliable predictions of how our climate system will respond under certain parameters. Nevertheless, because the climate has become a reflexive system, with some of these parameters influenced by human action, a definite prediction is denied to the reader. Human choice is the supreme uncertainty.

Conversely, the certainty with which the consequences are attributed to conscious decisions rather than a mechanistic determinism may be perceived as reassuring and urging. Fatalism and denial of this choice are equivalent to choosing the current trajectory, which will be devastating. The International Panel on Climate Change (IPCC) assesses scenarios that predict outcomes under specific conditions, the mechanisms at work, and possible contingencies. They do not decide how to act, what risks to take, or to whom to assign these choices. For better or worse, the IPCC remains disinterested and descriptive, thereby conforming to the value-free ideal for science.

This detachment is not acceptable if the only source of information about an urgent threat is ignored. That would mean to abandon any ideal of public reason which needs to incorporate superior knowledge. The classic matter of demarcation in the philosophy of science was, and is, driven in part by the considerable consequences a poor identification of reliable science has for practical matters (Resnik 2000; Mahner 2007). A mode has to be found that allows for science to remain independent and descriptive while promoting its active use in public decision-making. In *Science in a Democratic Society* (2011) (SDS)², which builds on the predecessor *Science, Truth, Democracy* (2001) (STD), Philip Kitcher identifies the “erosion of scientific authority” (2011: 25) as the central problem for contemporary philosophy of science: If there are people that know more than others regarding a certain topic, then they should consequently be treated as the

¹ In this thesis, it is sufficient to treat ‘global warming’ and ‘climate change’ as synonymous. Global warming refers primarily to the perceptible change of surface temperatures and its effects. This is caused by the earth’s continuing energy imbalance, better caught by the second term. Both, however, refer to the same complex of problems.

² All references without author and year provided in this thesis refer to *Science in a Democratic Society*.

source of information about this topic. Knowledge improves the ability to achieve various goals. Because of this utility, knowledge also improves the freedom of the individuals who have stakes in these goals. As technical knowledge today is distributed amongst experts, Kitcher considers their authority to improve individual freedom.

Kitcher's model is a social philosophy of expertise. The so-called "division of epistemic labor" (20) requires consideration of how knowledge is used, not only how it is produced: "integrating expertise with democratic values" (11). However, an official division creates contempt and distrust, as various people and knowledge traditions are excluded from the epistemic domain and fear an ideological dominance by these epistemically privileged groups (20). In the hypothetical ideal case, a well-ordered science, the whole population would agree to the division and build a collective consensus on the parameters of inquiry.

While Kitcher makes a convincing case for the initial problem, his contribution to a solution is difficult to judge. The scope of the task is colossal: to legitimize its authority, Kitcher desires to institutionalize direct democratic control over science. Additionally, science is to be kept productive and independent of dominant interest groups. In the discussion of CC (243–248) and the discussion of Kitcher's ideal (esp. Ch. 5&6), it is evident that Kitcher has a radically different organization of politics in mind. A collective judgment generated in egalitarian deliberation is supposed to govern science and other public domains.

The aim of this study is to analyze and evaluate the model for the interaction between science and society proposed in Kitcher's *Science in a Democratic Society* by using Kitcher's own pragmatic philosophy of science and the focus topic of climate change.

The first research question is how science and democracy should interact in Kitcher's model. To this end, I provide a critical analysis of Kitcher's conceptual and argumentative structure. The second research question concerns the normative value of the proposal presented in SDS. Following Kitcher's pragmatic perspective, this requires a naturalized argument. The proposals found in SDS will, therefore, be discussed in light of empirical studies as well as their logical structure.

Ultimately, to be of normative value, SDS either needs to deliver guidance on improving fact-based policy or, at least, advance the conceptual framework for such guidance. The model operates at a high level of generalization, and accordingly, strong backing is called for, if particular recommendations are to be derived from these generalizations. Hence, the second question is whether these ideals adequately support even Kitcher's "tentative suggestions" (83, 187, 221, 223). The scope of the analysis is limited to the issue of global warming, for reasons detailed later on.

The second section provides a critical analysis of Kitcher's account of science as a social institution, its philosophy, and how democratic governance for science is construed. The primary source is SDS, but I take recourse to STD at certain points to supplement omissions and contractions.

Kitcher designs a pragmatic account of science and the knowledge it produces. Science is thereby treated as a problem-solving enterprise as opposed to a purely truth-seeking endeavor. With climate change, a branch of the natural sciences has successfully identified a major global hazard, but the global community so far neglects to respond adequately. If the success of science is measured by its contribution to solving a problem, climate science does badly so far, because the public has barely proceeded beyond the identification of the issue. In consequence, Kitcher considers the social embedding of science currently more critical than the, presumably well-functioning, epistemic dimension. The analysis will be supplemented by literature from the philosophy of science, political philosophy, and related disciplines.

This provides the foundation for the subsequent assessment in section three. Climate science is discussed, in brief, concerning its epistemic and instrumental dimension. The limited facts in SDS are supplemented with empirical data from the natural and social sciences. For the natural science perspective, the fifth assessment report of the IPCC will be the primary source. Given that this is an elaboration of the current scientific consensus and since, following Kitcher, this scientific consensus should be at the heart of the scientific authority, such a limited focus appears permissible. A few studies on the reception of CC knowledge and its impact on belief formation are discussed to provide a naturalistic foundation for discussing the transfer of knowledge. However, given the abundance of literature on this issue, the selection is necessarily limited and opportunistic. Kitcher's argument is rooted in western democracy and liberalism and, consequently, most of the reports and research papers consulted here deal with the US and Europe. Thus, the empirical base of the thesis is constrained by practical limitations and implicit assumptions in the primary source text. Finally, this data is used to assess the possible improvements discussed in SDS.

1.2 Initial Literature review

There are numerous SDS reviews available that suggest a more reflected analysis is needed. The wide scope of Kitcher's theory touches several larger philosophical issues but often lacks clear explanations of their necessity. The following collection of issues identified by reviewers provides an idea of this width and the issues raised.

A substantial part of the book deals with ethical theory and how to locate public knowledge in it. Brown identifies the underlying conviction that ethics and science in its service

evolve pragmatically out of a natural tendency of human society to “progress away from violent conflict” (2013: 390). Keren (2013) is skeptical whether the egalitarian construct of ethical truth can provide guidance for science, as there is no necessity to govern science in that manner. Dupré (2013: 410) doubts that the well-being of future generations will feature in many people’s life goals. The collective well-being would thus need to be represented by ethical experts, whose necessity Kitcher firmly rejects throughout the book. Brown (2013: 395) goes so far as to call Kitcher “the ventriloquist for this ideal deliberation,” reprimanding him for not directly stating his own ideals, and demanding a more detailed argument how ideal and non-ideal elements relate to each other. This persistent ambiguity between Kitcher’s ideal democratic method and functionally emerging structures, including actual democracy, is a fundamental problem. Kitcher’s desire for a well-ordered (i.e., educated and aware of particular needs and bias) deliberation of all stakeholders can only be realized by avoiding actual deliberation in favor of hypothetical ideal considerations.

Moore (2012) finds Kitcher lacking detail in his views on actual political processes and deliberation, and D’Agostino (2013: 594) voices a comparable call for “a finer-grained, and more empirically informed account,” only this time with a stronger focus on scientific organization. Brown speaks of numerous empirical studies on citizen participation, while Kitcher recognizes only a minute number of these.

Wilholt (2014: 170) points out that the tutoring Kitcher envisages for lay-people seems to require some kind of “neutral or objective primer,” which is impossible if indeed all science is value-laden. In addition, the necessary presumption that the consensus of the scientific community is “epistemically privileged” is exactly the kind of premise that might lead to scientific elitism and a justified public opposition, unless resolved carefully. Brown (2013: 394–395) is similarly convinced that Kitcher actually argues for expert decisions, a “technocratic model,” because when it comes down to critical choices, scientists are best informed. Gaillard (2013) concludes similarly that Kitcher perpetuates a deficit model of knowledge, which only furthers the distance experts and lay-people. Wilholt (2014) is concerned that Kitcher’s rejection of the autonomy of science might lead it into the arms of powerful political interest groups, which will be equally eager to influence citizen juries as soon as they are granted the power to govern science.

That SDS offers insights and suggestions on particular aspects is recognized by all commentators, but the nature of the contribution seems to be less clear: Brown merely concedes that Kitcher “highlights many shortcomings in the current role of the sciences in democratic societies” (2013: 397). Dupré (2013: 410) respectfully points out the “interesting ideas on every page,” but finds no specific value in this model. Weinberg & Elliott (2012) affirm that scientific

research misrepresents the needs of the broader public. Wilholt (2014: 165) enthusiastically embraces Kitcher's ideas as "a framework for a normative discussion on the place of science in democracy," because it provides categories and concepts direly needed for a productive discussion, especially the "division of epistemic labor." Moore (2012) agrees and celebrates the notion of "unidentifiable oppression," i.e., being restricted in freedom but unable to identify an oppressing source due to the overwhelming complexity of modern societies (SDS 78).

Douglas (2013: 902, 905) worries about the false assumption of invariant personal preferences and the diminished opportunity for acquiring facts and preferences in actual conversations. Similarly, Bätge et al. (2013) conclude that Kitcher's ideal theory is insufficient in providing guidance because it does not come close to developing a realistic model of an actual person making judgments. In addition, they criticize the apparent violation of value-pluralism through the exclusion of non-secular arguments, without a convincing argument why these may not contribute to the discussion, just like other minorities.

Conversely, driven by the desire to keep partial interests out of science, Gaillard (2013: 256) proposes that coming reforms in scientific governance should indeed follow Kitcher's vision. "True deliberation" should create the panhuman conversation that comprises all partialities. Gaillard proposes vaguely to design national institutions through "social experimentation" (2013: 253). Yet, options for the implementation of such governance is exactly what Moore (2012) and D'Agostino (2013) would have desired to find in SDS to judge Kitcher's model useful.

The opaque relation between ideal and non-ideal conceptualizations and procedures poses a significant problem for guidance (D'Agostino 2013, Brown 2013). Kitcher does not employ this terminology but similarly distinguishes "between specifying an ideal, something at which our practices should aim, and identifying procedures for attaining or approximating the ideal"(125). The latter is, in Rawlsian terms, called 'non-ideal theory.' Simply put, even if there was a perfectly acceptable abstract ideal, its execution in the real world poses a number of particular problems. In particular, approximating and attaining the ideal are different goals. For example, even though Kitcher eschews the term 'utopian' (125), some of his ideals are so distinctly impractical – especially the "panhuman conversation" (112) – that any steps toward it are necessarily mostly incomplete. Thereby it becomes a theoretical question which parts of the ideal to aim at preferably.

There seems to be no agreement on what exactly SDS contributes to this vital discussion. Most reviewers focus on one or more of the larger concepts, without considering their connected function. This thesis examines if there is indeed a generalizable feature in SDS, which

elevates Kitcher's account above others and could guide an improved utilization of science by a democratic society.

2 Science in a Democratic Society

This section explores Kitcher's SDS in depth. In the introduction, I claimed that Kitcher has a radically different organization of society in mind. Kitcher designs a deliberative process of public decision-making that excludes important present elements such as the media and elected representatives. This is supposed to reduce current epistemic and ethical failures. Kitcher repeatedly stresses that most social institutions developed without a modern conception of democracy and, therefore, do not provide the utility required today.

Kitcher desires to utilize science as an instrument of democratic progress, rather than an elitist hobby or an intellectual mode of control. For that, Kitcher needs a general account of how to make value-judgments, so as to show what constitutes democratic value-judgments and how science can contribute to these. Consequently, the abstract features proposed here improve on democracy, first and foremost.

This section first discusses Kitcher's concept of science and the philosophy of science, as presented in SDS, from which a normative perspective can be deduced. Next, the analysis of Kitcher's account follows the narrative development from the anthropological foundation of ethics and the notion of democracy, through the social value of knowledge, to the organization of science, and finally, its proposed governance.

2.1 Kitcher's science and its philosophy

The first chapter of SDS opens with an essay on the current issues surrounding the perceived ineffectiveness of science, such as elitism, scientism, epistemic relativism, or the value-free ideal. In this section, 'Science' is defined as the institutional collective of the natural sciences, while 'sciences' denotes the diverse fields of inquiry³. For the last few centuries, these have "increasingly been viewed as the epitome of human knowledge, potentially capable of delivering great benefits for nations and for the human species" (15). The public and its agents have developed trust in the reliability of the knowledge generated by science because it has been demonstrated to solve particular, relevant issues. This trust is the source of the public authority of scientists (15n1, 15-17). Consequently, the reliability of scientific knowledge, in general, has to be understood as justified by the observed technological utility in particular cases.

Kitcher's terminology is not elaborated beyond these definitions in natural language. Evidently, the natural sciences are conceived of as part of a historically singular tradition that shares a new kind of inquiry. The character of this new kind of inquiry is not specified but the consequences are. The natural sciences were able to produce highly useful knowledge,

³ I do not follow Kitcher's convention to capitalize 'science.'

surpassing other knowledge traditions with regard to numerous significant problems, which gave them authority. If an expansion of the fields of inquiry is possible and leads to “similar[...] authoritative advice” (17), then it would appear that the defining element is the modality of inquiry and not the subject matter. However, Kitcher explicitly states that “[t]he history of three-quarters of a century’s work [of the philosophy of science] has shown conclusively that different areas of Science are methodologically diverse” (154). It is therefore difficult to specify the criteria defining science apart from a historical tradition and its substantial utility.

Other kinds of academic inquiry not deemed natural sciences, i.e., arts, humanities, and social sciences provide further material to elaborate on Kitcher’s notion of science. In the discussion of public knowledge, Kitcher recognizes the term ‘sciences’ sometimes to be “used *inclusively*” [my emphasis](85) to cover all academic disciplines – although this is not the standards notation in SDS. These other disciplines create knowledge of equal reliability because the “rigor [...] is in no way inferior” (85-86) to that encountered in the natural sciences. So, in addition to the previously mentioned perceived reliability, there is internal reliability that results from the process of knowledge production and not its utility.

These rigorous investigations “play a central role in our contemporary system of public knowledge, that body of shared information on which people draw in pursuing their own projects” (85). Kitcher understands scientific practice, and other knowledge traditions, as providing knowledge to a system of public knowledge (SPK), preserving it for later use (25-26, 85-104, 105-111, 147-153). The private projects determine what kind of problems would be considered “significant” (105), i.e., worth investigating. The parameters of an adequate solution are also determined thereby. These concepts are discussed in more detail in the following sections.

Kitcher sees the authority of science undermined by an exaggeration of its power and implications. Opposition to particular sciences, when these have a “perceived impact on ideas and ways of living that people cherish” (16), can generalize to allegations of “imperialism” (20) if scientific knowledge is granted a generalized privilege. ‘Scientism’ is the term used to refer to positions that advocate this; it is a belief that “all questions of a specific type can be addressed by future research, or even that all important issues can eventually find scientific resolution” (17). The first aspect includes overzealous scientists failing to understand that problems might be solved without their kind of knowledge. The second aspect adds a sort of reductive ethical determinism. The examples given, “neuroscience, evolutionary psychology, and rational decision theory” (29), share a potential to model human behavior in stimulus-response mechanisms only. These disciplines have little else in common and, except for neuroscience, do not even fit the narrow definition of science.

Dismissing alternatives to scientific understanding as inferior is unacceptable because present human conduct and decision-making would be negated, thereby causing justified resistance (18-19, 28-29). If it is the purpose of science to work problem-oriented, where the problems and qualities of their solution are those of the larger public, then the selection of problems has to represent that larger public. If the public had no valid resources for negotiating these problems, the direction of research would have to follow from scientific reasoning itself. However, philosophers of science widely agree that the so-called context of discovery is value-laden and, therefore, influenced by personal interests (32). The discussion of Plato's philosopher kings shows that Kitcher considers even the wisest people afflicted by egocentrism (22-25). Thus, it is a mistake to ignore the value-judgments of less knowledgeable people. If the selection of significant problems is biased towards whoever decides, external democratic control is preferable to internal control.

Overselling and overestimating science convene at the goals of "understanding Nature" (153) or compiling "a complete true story of our world" (106-107, STD: 55-61). Kitcher rejects this "Baconian hierarchy" (STD: 77) to be a useful model of scientific practice, as particular inquiries do not primarily derive their significance from their contribution to these goals. Kitcher dismisses the 'Unity-of-Science' movement because the substantially increased complexity required to unify different theories reduces their utility (STD: 69-71). Consequently, even parameters internal to epistemic labor need to be selected according to their practical significance. Kitcher is very clear that research without immediate utility, for "epistemic significance" (STD: 65) only, is beneficial for scientific progress and thus the resolution of practical problems arising later on. However, trust in science will be diminished by false promises since the public assesses utility and not the understanding achieved. An example is the failure of human genetics to provide medical relief (17-18, 173-174). In consequence, Kitcher demands thorough candor with regard to the possibilities that research without immediate application could eventually provide.

An appropriate normative perspective for this thesis can be developed from the pragmatic notion of inquiry on which Kitcher builds his argument. In §25 of SDS "*The Role(s) of Philosophy of Science: A Brief Excursion*," he clarifies the function of a pragmatic philosophy of science and thus provides an explicit norm against which to judge his work:

"The fundamental goals of the philosophy of science remain what they have always been; namely, to use reflection on one or many areas of inquiry to improve scientific practice and to make the standards of good inquiry more evident – goals intimately related to the two ideals of the previous section [i.e., well-ordered certification & ideal transparency]. Once the diversity of the sciences is fully appreciated, positive effects are most likely to be local, although generality is welcome, when it can be achieved. Potential failures of well-ordered certification provide important occasions for philosophical work. Protracted disputes often

signal places where a more general perspective can help, [... e.g., with] the credibility of models of climate change. [...] More general philosophical issues, about explanation, theory, or certification are pertinent insofar, and *only* insofar, as they promote the more local work.” [original emphasis] (154)

Here, Kitcher employs three criteria for delineating the function of any philosophy of science: two positive and one negative. The positive criteria, improvement of scientific inquiry and illuminating its features, are presented as goals. Consequently, these are outlined closely by the ideals Kitcher proposes for guidance. The negative criterion limits the scope of philosophical inquiry of science to the initial problem as far as possible. It is essentially an antimetaphysical restriction for philosophic inquiry to those objects required for scientific progress.

The positive criteria and the corresponding ideals contain an element of external governance for science. The first criterion, improvement of inquiry, seems uncontroversial and typical for the philosophy of particular sciences but, here, it includes both the selection of goals and the procedures internal to science. The philosophy of science is supposed to investigate “specific issues that concern the goals of [scientific] inquiry and of the successful pursuit of these goals” (153-154). Aiding successful pursuit is equivalent to improving scientific investigation. This corresponds with the traditional investigation of methodology and reliable knowledge. However, as a consequence of the debate about values in science, this narrow scope is insufficient for a theory about science as a social practice.

Consequently, Kitcher includes the selection of goals for inquiry as a concern for the philosophy of science. The direction of research would be “well ordered” if the areas of research and the questions posed are judged “significant” in an ideal deliberation (106). Yet, as science is not only influenced by these obvious judgments and, therefore, value-judgments internal to scientific inquiry need to be governed likewise. Certification is the acceptance of particular findings into the SPK through the publication of, building on, and, ultimately, the teaching of results. It would be “well ordered” if all cases of explicit standards and particular judgments within inquiry and its review were to accord to judgments of “reasonableness” of ideal deliberators (147-150).

In a nutshell, Kitcher posits that both the selection of goals for inquiry and the parameters for certification of knowledge need to be governed by an institutional scheme representing the people. Failure prompts philosophical evaluation.

The second goal, making standards of good inquiry more evident, deals directly with the social function of scientific inquiry. To be relied upon, public knowledge has to be accepted as true and adequately reflecting individual values. The values underlying inquiry have to be accepted as reasonable for the results to be relied upon. Based on recent research in the

philosophy of science, Kitcher dismisses prior attempts to strictly separate values from scientific inquiry in the value-free ideal for science.

The generation of facts has to be transparent so that laypeople can acknowledge that reliability and relevance: “A system of public knowledge is ideally transparent just in case all people, outsiders as well as researchers, can recognize the methods, procedures and judgments used in certification [...] and can accept those,” (151). The purpose of the ideal, Kitcher elaborates, is not to have everyone know everything, as the ideal would seem to suggest, but to design the system in such a way that “you could, in principle, probe any part of the system, and that, were you to do so, you would disclose processes of certification that conform to your standards” (152). Kitcher thus introduces a criterion of intersubjectivity for public knowledge, which explicitly includes the value-laden standards of all. Agents and processes should adhere to standards everyone would accept as within reasonable limits. The knowledge thus derived ought to be authoritative until revised.

Kitcher assumes that this condition is met, and the values of most people are already considered. If a unified account of evidence were possible, philosophers of science could scrutinize the various fields of inquiry and would demonstrate that certification is, in fact, largely well-ordered. Such “ideal demonstrative work” (153) would improve acceptance. In practice, plausible improvements might be achieved by discarding the value-free ideal and then being transparent with the reasoning behind certain decisions (163). The second present challenge for the philosophy of science is to improve the acceptance of scientific knowledge and thereby its utility.

Finally, Kitcher restricts philosophical inquiry to advancing tangible problems. Kitcher dismisses “understanding Science” (153) as a distraction. Both science and its philosophy derive their value from their utility in solving or advancing particular problems. Their value is a function of the significance of these problems. Consequently, any understanding attained is valued just as much. Broad generalizations are restricted, because, unless the significance of generalizations can be demonstrated, specific answers are of higher functional value, easier to test, and more transparent for others. Kitcher thus construes philosophical concepts as “instruments” or “tools,” which are created for identifying and improving on a specific problem in scientific inquiry (154-155). Generalizations are then just an intermediate step or an additional benefit.

The three criteria above involve two dimensions, “epistemic considerations” and “questions about the social embedding of inquiry” (155). The philosophy of science has researched the epistemic aspect thoroughly throughout the last century but never expanded to encompass the pluralism now evident, Kitcher claims. A unified account of evidence cannot be

provided to convince the public of the success of certification and its compliance with the public's values. Hence, the most pressing topic for the philosophy of science today is the proper democratic organization of knowledge production, the so-called division of epistemic labor. This is the topic of SDS.

The blockquote above guides the central question and method of this thesis. Kitcher's pragmatic perspective employs an instrumental approach. Science and its philosophy contribute to solving specific problems. Science aids the community by generating knowledge about the physical entities involved in a particular problem. The philosophy of science is supposed to aid science in this task. Therefore, the philosophy of science should be as specific and particular as possible. Conversely, deliberations on general topics should be an exception, justified only by the failure to improve more specific issues.

In contrast to these considerations, the institutions SDS deals with are located at the highest possible generality, i.e., the whole of society, all public knowledge, or a panhuman conversation. It might very well be claimed that this is a pure idealistic political philosophy that violates the third principle discussed above. Yet, this labeling is fruitless and distracts from the pragmatic question: Where is the utility of Kitcher's argument?

If there is a function in designing an ideal democratic system of knowledge that cannot be provided by particular local improvements, the principle would not be violated. Kitcher aims to offer a "thorough analysis of the problematic relations between scientific expertise and democratic values" (13), ideals for inquiry, and some suggestions on how these might be solved through citizen councils. Therefore, I will assess Kitcher's argument following the pragmatic paradigm developed above, with respect to the particular case of climate change, and formulate my thesis accordingly:

A model of science or expertise in a democratic society is pertinent insofar, and only insofar, as it improves the consideration of knowledge about climate change in public policy.

There are several necessary annotations and premises for this thesis: Firstly, it is necessary to have a specific problem at hand, for which philosophical tools can be developed, or the pragmatic perspective has no point of reference against which to judge the success of these instruments. The focus topic of climate change is defended and specified in section 3.1.

Secondly, the preliminary premise is accepted that climate change is rightly judged the most significant problem for a democratic society. Kitcher explicitly assumes that given knowledge of the facts close to everyone would want to preserve the world as we know it. If climate change is indeed the problem of the highest social significance, then it stands to reason that a normative account of science in society will need to improve on that problem.

Thirdly, a critical discussion of the concepts and approaches employed is necessary to ensure coherence when speculating on the impact of Kitcher's model on the problem of climate change.

2.2 The Ethical Project

The ethical project is a fundamental but ambiguous concept. It serves at least two connected functions in the argumentation of SDS: It provides an ideal of collective decision-making and a theme of a progressive history that naturalizes this ideal through its equation with ethics. This section focuses on the naturalized justification of the ethical ideal, while the next section discusses the specifics of the ideal for collective decision-making.⁴

The "original function" of the ethical project is presented as "the remedying of altruism failures" (57), in the prehistoric stage of humankind. This is an evolutionary perspective that understands cooperation as an advantage for survival. Cooperation emerged in response to a hostile environment. In a first step, humans acquired the capacity for cooperation and, in the second step, the capacity for normativity.

The earliest humans "required a capacity for psychological altruism. That is, they had to be able, on occasion, to respond positively to the perceived wishes and intentions of those around them, to recognize what another band member was attempting to do, and to modify their own plans so as to help the other realize a goal" (41-42). This initial psychological capacity simply provides the ability to cooperate for mutual benefit, as is common amongst animals. Creatures do not cooperate if egoism leads to higher rewards, which is what Kitcher refers to as 'altruism failure.'

Subsequently, humans developed "a capacity for normative guidance" [emphasis removed](43) that supplemented our limited psychological capacities and "practices of rule giving and rule following" (42) emerged. Somehow, it became possible to agree on rules (norms) that provide abstract guidance. This marked the beginning of Kitcher's ethical project.

Prompted by anthropological studies of contemporary human tribal societies, Kitcher paints the image of an original mode of ethical guidance. This "authoritative conversation" was an egalitarian deliberation amongst adult members of the tribe who determined the appropriate conditions for a social order that solves pressing problems and is acceptable to all its members (43-44, 49). Considering the pragmatist premise, however, deliberations on ethical theory are secondary to particular solutions. This had to be, therefore, a kind of human proto-democracy.

⁴ Kitcher wrote an additional book collecting his ideas on *The Ethical Project* (Cambridge Mass., Harvard UP: 2011). I do not consider this book here because my main interest lies with science. Chapters two, three, and four of SDS detail Kitcher's ethics sufficiently.

It is central to Kitcher's understanding of social organization that the two practices, ethics and democratic discourse, are considered to originate in the same tribal practice.

Based on this philosophical anthropology, Kitcher terms ethics a "social technology" (47) that originally expanded the possibilities of social organization through cooperation. It is an instrument of progress, which Kitcher explicitly takes to be prior to truth. Kitcher's pragmatic notion of ethics is made explicit here while reintroducing a pragmatic notion of truth:

"Progress [...] is progress *from*, measured in terms of our ability to solve problems – both the original problem that set the enterprise in motion and those that emerge from our responses. [...] Truth is constituted in terms of the tools that solve our problems. More precisely, true ethical statements are those corresponding to precepts that are introduced in progressive transitions and that continue to be maintained under an indefinite further sequence of progressive transitions: a rule enjoining honesty was almost certainly a progressive step in our ethical past, and something like it (albeit vague) will almost certainly be preserved in our future progressive steps. The truth of the statement 'Honesty is good' *consists* in just that relation between the rule and ethical progress." [original emphasis] (48)

A conceptual analysis clarifies the defining elements of this approach: The three central concepts are progress, ethical truth, and norms:

- (a) 'Progress' is defined as 'solving our problems.' A transition is progressive if a problem of ours is successfully overcome.
- (b) 'Norms' are the instruments (rules, ethical statements, or moral precepts) that function with the normative capacity to govern behavior.
- (c) 'Ethical truth' is defined as instrumental success between norms and progress; additionally, a norm is true only if it is indefinitely maintained under all further progressive transitions.

Provided that it is possible to delineate a transition between two points in the history of a community in which a single problem was attended to. Such a transition has to introduce one or more instruments in response to the problem. Kitcher uses 'ethical progress' explicitly in analogy to 'technological progress.' Considering the more general definition (a), this suggests two different kinds of instruments of progress: community-regulating norms and environment-manipulating technologies (47). Thus:

- (d) Instruments employed in a transition are either norms or technologies.

The term 'ethics' is fuzzy in this account, which creates an ambiguity. On the one hand, there are norms employed as instruments. They are moral precepts enforcing a particular behavior. The attribute 'ethics' describes the socio-technical nature of these instruments.

On the other hand, there is the authoritative deliberation which defines the instruments to employ and to what end. This matches the general understanding of ethics, as the search for the good to guide human conduct. This ideal deliberation embodies Kitcher's answer to the question of what is good. The altruism failure remedied by the ethical project lies in the egoistic habit that individuals cooperate only in those cases where higher rewards can be expected. Therefore, Kitcher abstracts a process by which individual subjectivity is retained and a shared perspective developed. It is an explicit exchange of individual goals and a negotiation of priorities – the negotiation of significance.

Indeed, per definition (a), 'progress' is necessarily 'ethical progress,' in the sense of advancement through collective self-governance, because it requires a specification of "our problems," which presumes a negotiation. Moreover, Kitcher seems to employ "ethical progress" and "progressive transitions" synonymously to refer to the same class of historical events (46). For increased clarity, (a) can be redefined as:

- (e) A transition is progressive if it is ethical and successful.

Developing a purpose in collective discourse leads to the inevitable issue of identifying the discourse community and the long-standing issue in political theory on how to make a public will manifest. In SDS, it is evident that Kitcher assumes a specific kind of collective decision-making and a corresponding social organization to be properly democratic. Most strikingly, even the organization of epistemic labor in SDS is qualified as preliminary, as the "ultimate authority resides in ideal deliberations" (227). Because of this insistence on a negotiation of interests and purpose, Kitcher should be considered a proponent of a kind of discourse ethics, in which the collective of individuals continuously generates its ends.

The next section will return to this organization and its procedure. For now, it is important that Kitcher understands democracy to be defined by "discussion on terms of equality" (67). Kitcher rejects simple majority decisions, that do not consider minority interests adequately, as undemocratic. This identifies a democratic essence of communal decision-making regardless of present democratic procedure (65). Its absence constitutes the "tyranny of ignorance" (113), where ignorance does not relate to facts but interests and needs.

Kitcher does not endorse the dictate of any absolute goal. The notion of ethical experts, i.e., people who prescribe norms, is firmly rejected. Their prescriptions of particular norms idealize the instruments, which are then maintained regardless of present problems (49). The proper procedure, however, is set absolute:

- (f) A transition is ethical only if it is developed in an ideal deliberation.

If it is the proper discourse that is good, it would be preferable not to refer to (moral) norms in general as ‘ethical’ entities because that creates inconsistency within this account. Then the ethicality of a norm can be inherited from the transition of which it is an element:

- (g) A norm is ethical only if it is an instrument in an ethical transition.

The example given is the moral norm promoting honesty. Honesty is discussed as a necessary condition for sharing knowledge amongst the tribe, suggesting this to be a major progressive transition (87). So, there is a successful and ethical transition towards a shared knowledge system for which the norm is instrumental. The norm is ethical only in a transitive sense, as part of an ethical transition. Honesty is an ethical norm if it is employed with the intention to facilitate the collectively desired exchange of reliable information. If honesty was introduced to, say, to make the population more malleable for a malevolent government, the norm would be unethical.

The same has to apply to technological instruments. Kitcher clearly subordinates even the earliest epistemic labor, and consequently knowledge-based applications, to a socially negotiated value framework that directs the efforts towards significant goals (86ff). Hence,

- (h) Any instrument is ethical only if employed in an ethical transition.

The notion of instrumental success as the condition of truth is clear but controversial. Richardson reports that “Bertrand Russell lampooned Dewey” (2014: E-109) for such an instrumentalist notion of truth because it would allow for ridiculous facts to be true as long as success follows.

There is no elaboration on the additional criterion in (c). The indefinite maintenance of norms might be understood in light of Kitcher’s ontological agnosticism. A relation of success allows for a plurality of true representations of the world (106-107). If some constructs continue to represent nature adequately throughout all future transitions, they might prove ultimately true. Similarly, some parts of the social order (i.e., norms) may persist indefinitely under progress and thus prove true⁵. This, however, is speculative and unnecessary for a pragmatic perspective. It is only success that is required:

- (i) A transition is successful if the instruments employed provide the intended functionality.

It is important to differentiate between the measures positively taken and the intended function. As discussed in the previous section, science and philosophy are valued for their utility in providing instruments. Their knowledge increases the chance of transitions being successful.

⁵ Alternatively, it might be part of Kitcher’s pragmatist background that exceeds my knowledge. Apparently, C.S. Peirce’s ethics contained a similar element (cf. Pieper 2007: 273).

Yet, if a particular instrument is successful or not depends not on their truth. So, sacrificing to a sun god was certainly a functional tool to avoid another solar eclipse but any alternative action would have yielded the same result. Only the observation of the causality failing would reveal the falsehood and improve knowledge.

If success in the real world is treated as an indication of truth, the situation can be understood as a very wide version of underdetermination. Instrumental success is required, so the quality of knowledge is measured by its manipulative power. The instances to evaluate any instrument are rare if there needs to be a collective affirmation first and there will rarely be a transition with just one instrument introduced. Primarily, empirical precision is needed here to document the manipulative effects of various instruments under various conditions and infer on their truth. This corresponds to the rigor and reliability in Kitcher's definition of science, as discussed in the previous section.

Kitcher ultimately desired to expunge religion from public knowledge because it is incompatible with alternatives, as discussed further down. The theories it is based on false and it actively inhibits knowledge that collides with its postulates. However, religion provides adequate functionality under some conditions. (c) cannot be maintained.

This functionalism leads to the final conceptual issue if some transitions may be called 'ethical' in another sense than (f). The second example of ethical progress, the abolition of slavery in modern times, should, in Kitcher's view, be considered an obvious example of "ethical progress," because the norms changed to "liberate[...] us from the difficulties of a human predicament" (46-47). This is inconsistent with the pragmatics of the historical situation.

In the United States, Abraham Lincoln decreed the abolition of slavery in the Confederate territories with the goal to stop the secession (Depkat 2008: 225). The prior maintenance of slavery was driven by the very same reason, making it easy to identify the unity of the states as the purpose of both policies, and Lincoln's principal agenda. Then again, the abolition could be considered progressive because it was a morally progressive goal in the eyes of many people at that time - including Lincoln. Yet, this opinion was not strong enough to lead to respective policies and thus must be considered a minority agenda in the discourse prior to its introduction.

Regardless of questions of legitimacy, it is a fact that the political process at this time prioritized the goal of reunification over the abolition of slavery. Lincoln, as its principal agent at this point, introduced the abolition as an instrument. The transition was successful because the secession was avoided. However, this cannot be considered an ethical, and thus progressive, transition because the terms of equality were not met in the political process. Condition (f) is not met here.

Alternatively, as Kitcher sees it, the abolition of slavery is considered progressive because it restored some equality to the human community. It is progressive because it moved the discourse community closer to a condition under which ethical decisions can be made, even though it was not the intended purpose. Hence,

- (j) A transition is progressive if its end state is closer to the ideal discourse community.

This circularity marks the fundamental argumentative problem with Kitcher's 'ethical project.' If the ideal conversation is an obligatory requirement for selecting progressive goals, it cannot be a goal itself. If progress requires an essential deliberative core, then attaining that deliberative core is prior to progress and any transition that diverts from it is counter to progress. Progress towards an ideal discourse community thereby receives priority over any positively negotiated goals.

Thus, it needs to be concluded that the ethical project is not a developing pragmatic politics, in the sense of situated, collective decision-making. It requires a strong deliberative-democratic foundation that would allow for such a pragmatic process to be both egalitarian and well-informed.

2.3 The Ideal Conversation

SDS elaborates extensively on the ideal discourse. Kitcher imagines a simple state of communal decision-making and scales it up. In this section, I discuss the structure of this procedure and the views of democracy around which it is constructed, before considering the element of specialist knowledge in the next section. Following the previous argument, the fundamental question here is if this ideal is useful in guiding the present social organization towards a more progressive state.

Based on the structure of authoritative conversations of compact communities, Kitcher abstracts an "ideal conversation under conditions of mutual engagement" (49-58) An ideal deliberation amongst ideal participants, this procedure adaptively generates a "collective will," from the variables of interests and knowledge (114). The result serves as an explicit collective value position for actual decision making.

Kitcher uses the terms 'ideal conversation' and 'ideal deliberation' in slightly different contexts. The former is the ideal mode of negotiation of norms, as seen in the quote below, while the latter is the ideal mode of negotiating ends with the interface to science added. Their hypothetical nature and substantial structural overlap make it redundant to differentiate, which is why they are treated as synonyms in this thesis.

The ideal conversation is defined through three characteristics. Firstly, the body of discussants consists of all members of the species, present and future (53). Secondly, it aims to provide everyone with opportunities for a good life. And, finally, a set of conditions is met:

“[T]he general good is a state in which all people are offered serious, and equal, opportunities for worthwhile lives, where worthwhile lives are understood in terms of free choice of projects, some of which involve interactions with others. Decisions about norms and values should be reached in a panhuman conversation under conditions of mutual engagement” (112).

The “conditions of mutual engagement” define the limits of the negotiation of interests (51-53, 114-115). It includes two types of conditions: “epistemic” and “affective” conditions. The former group consists of the condition not to rely on “false beliefs about the natural world” (51), a power to recognize the consequences of actions for people and the issues under discussion, as well as an ability to identify the interests of other participants.

The latter group contains just the imperative to give the desires of others equal weight in the conversation, which implies a requirement to share interests during the conversation (51-52). Kitcher terms this balancing “mirroring,” which basically requires seeking a consensual solution. In a nutshell, the participants in such a conversation share their interests, discern acceptable interests of others and refine their own interests accordingly to develop the best collective path of action.

Thus, the structural elements of that conversation are the inclusion of every human alive or expected to be living (‘panhumanism’) and serious equal opportunities for all (‘egalitarianism’). On the individual side, there are the cognitive capacity to comprehend consequences (‘comprehension’), the willingness and capacity to be receptive for contributions (‘receptiveness’), the willingness and capacity to contribute their interests (‘openness’), and sympathy for the interests of others (‘compassion’). In addition, there is a condition to rely on facts (‘validity’).

Kitcher is strongly influenced by John Rawls as evidenced by the numerous references to Rawls in SDS and STD, as well as the analogy in terminology between the “well-ordered science” and the “well-ordered society” (Rawls 1999: 4–5). The differences in justification and structure of an ideal society, however, indicate little substantial overlap with Rawls’s theory.

Rawls imagines a hypothetical deliberation to find the structural design of a just society. The particularity of the participants is hidden behind the famous veil of ignorance so that the participants have to reason ignorant of their actual standing in society (Rawls 1999: 118). Because of this move, inequalities are expressions of collective well-fare rather than personal benefit.

Kitcher, in contrast, does not reduce individuals to generic deliberators but proposes to represent their particularity. The goal of the deliberation is not a just political order, because that is the supposed nature of the ideal deliberation itself. Furthermore, under the conditions posed there seem to be necessary conclusions on specific items following from the ideal structure. This is indicated by Kitcher's "strangely disembodied subjunctive mode of argument" (Brown 2013: 395), manifest in repeated declarations of what any of Kitcher's ideal institutions "would" recommend.

It is Kitcher's central liberal tenet that each individual has the right to judge their own goals in life because that is the essence of a "worthwhile life" (54-55; also 21, 118, 200). The strength of this conviction is obvious in Kitcher's discussion of democracy as an efficient instrument in providing the necessary conditions of freedom and equality (65ff) and providing the means to exercise some control over the social policies that affect these goals (70, 172). Even then, the deliberation is to provide opportunities to attain these goals rather than their collective satisfaction. While the term is missing in SDS, Kitcher clearly understands the central component of a good life to be its autonomy.

Here, democracy is understood as a political institution supportive of its citizens setting and achieving their goals. The goal of the ideal conversation is to balance the interests of all the autonomous subjects and generate a collective will, which directs collective institutions. If only the respective individual has the right to judge their own interests, it follows that Kitcher includes the whole population in such a balancing act. The ideal conversation seems necessary to govern democratic institutions, not only science, in a fully rational and liberal way. It is the attempt to "create a space in which the entire range of our inquiry could be soberly appraised" (127). Then, after everyone presented their situation and detailed what their political interests mean for their life projects, a deliberation could be truly egalitarian because it would feature "the ideal of full representation" (200). It would be "enlightened collective problem solving" (Moore 2012: 816).

There are various problems with that ideal. First of all, the ideal proposed is politically more extreme than the numerous references to liberal theory suggest. In an amusing simile, Richardson identifies egalitarianism as a suitable principle to build an argument on: "Rhetorically, since the ideal of treating persons fundamentally as equals is even more popular than eating meat, [Kitcher] is on strong ground here" (2014: E-106). However, the notion of equality employed by Kitcher goes much further than the principle of equal opportunity that is a widely accepted principle in the western world.

Kitcher assumes that historical inequalities are a mistake – a deviation from the proper path of the ethical project. Kitcher clearly sees collective action, even in its crudest prehistoric

form, as an empowering strategy to expand the freedom of the individual, i.e., the capacity for action. This requires a just distribution of goods to advance opportunities in practice. Kitcher clearly sees collective action, even in its crudest prehistoric form, as an empowering strategy to expand the freedom of the individual, i.e., the capacity for action. This transgresses liberal theory, which primarily focuses on rights that provide liberty, i.e., safeguarded opportunity only (Berlin 1969: liii–liv). Moreover, as a just order, the outcome of an ideal deliberation need not be protective of individual rights, because they would have been adequately considered in the conversation.

The goals for research, as most resources, are currently not distributed equally and therefore require a cosmopolitan approach (116–118). This is necessary to satisfy the basic needs that Kitcher assumes to be obviously prioritized in an ideal deliberation (122–123). The next chapter mentions that meat production needs to be substantially reduced to reach an equitable solution to climate change. It is doubtful, pace Richardson, that the ideal of equality prevails for long if average citizens have to restrict their carnivorous pleasures. Yet, the egalitarian of Kitcher’s ethics necessitates this restriction of the freedom of some to increase the freedom of many.

Secondly, the notion of altruism encountered in SDS is inconsistent. Kitcher’s justification for aiming at the ‘good life’ for all is the avoidance of the “altruism failure whose presence causes social tension and unease” (54). With the capacity for normativity, as discussed above, came the option to follow rules that do not immediately benefit a person. If failure leads to social tension, this seems to indicate that norms are stabilized by a promise of profit maximization. Yet, such strategic thinking is merely a more imaginative variant of the fundamental capacity to cooperate. However, to deal with an external threat in a manner beneficial to all members of the group is not ‘altruistic’ in the sense of ‘personal sacrifice.’

This alternative meaning – acting for someone else’s sake at personal cost – is used in the discussion of more concrete questions of collective endeavors (103, 203, 217). It can hardly be imagined how waiving certain privileges would benefit one personally. It is therefore not simply a strategy to maximize benefits. It has to be concluded that this refers to an alternative trait. Such strong virtuous characters cannot simply be presupposed (Koertge 2013: 1118, Richardson 2014: E-109) but the ideal deliberation does require some initial demands to be reconsidered, as will be discussed shortly.

The first interpretation can be understood as a constitutive element of community. The features of the prehistoric community are highly conducive to consensual collective decision-making: negotiations amongst all members, the limited number of members, the external pressure of survival, the limited amount of knowledge available, and the personal and local

proximity that promotes trust through the daily experience of reliability (43-44, 78). Similarly, Kitcher uses a modern family to illustrate “responsible decision making” (114) which is marked by the same egalitarian attitude to address the various interests, by an ability to maximize success under uncertainty, and by a rational deployment of collective resources in a collective project (113-115, 120, 194).

Both images, family and tribe, exemplify an essential element of a community of individuals, i.e., the recognition of the others’ interests and an inclination to accommodate those. Only if all members are convinced of their due consideration, can cohesion of the community be expected, because only then norms may be considered consensual. The examples are primitive insofar as the goals are determined by external factors and the group is compact.

In addition, Kitcher is strangely oblivious to the power relations that exist in even the smallest of communities. This is another similarity to Rawls, who was criticized for excluding the private domain from considerations of justice, although he considered family to be the context in which justice was learned (Holzleithner 2009: 68–69). While a progressive family may strive to have an egalitarian balancing of interests, intimacy creates opportunities for oppression just as opportunities for compassion.

The proximity in small groups is conducive to openness and reception because those are the conditions under which others can be compassionate. However, the essential element is the willingness to accommodate other autonomous subjects. Hence, the participants indeed need a virtuous character because the element of egalitarianism manifests in the compassion extended towards others. A virtuous community is then defined by its internal solidarity.

The adequate representation of interests is a key problem of democratic theory. Until now, I did not attempt to specify the notion of ‘interest’ out of convenience, using it vaguely to refer to all intentions and intentional behavior. Kitcher uses various terms to denote the preferences of individuals and introduces qualitative criteria to classify them.

For deciding on norms, the ideal participants transform “factually well-grounded desires” (52) into “sympathetic desires” (51) that respond to the desires of all (53). For deciding on lines of inquiry in a well-ordered science, preferences show a similar progression (113-115). Individual preferences are epistemically validated through tutoring by specialists. The individuals in this procedure develop their raw preferences into “tutored preferences” that concur with the evidence available. In a second step, they deliberate to arrive at “refined preferences” which are solidary.

The fourth class of preferences is used by Kitcher to provide a negative delineation. These are termed - in mostly non-ideal terms - “short-term wishes,” “distorted desires,” “misguided preferences” (128), “uninformed and rash impulse[s]” (64), or “raw and untutored, typically self-

directed [needs]” (126). The desirable preferences are, in contrast, referred to as “*interests*”[original emphasis] (128), “settled preferences” (64), “deeper and more central wish[es]” (128), “life projects” (182), or an individual “set of consequential issues” which we should be invested in (80).

The primary difference is between superficial and refined goals. The separation between impulses and misguided preferences is not precise because the same contextual information constrains what is desired and what is considered possible. However, Kitcher is adamant about minimizing manipulative influences that hamper the individual’s ability to decide on their goals and the selection of appropriate measures. These influences include dogmatism as well as deliberate misinformation (102, 125, 159, 183). As Kitcher puts it, the individual wishes need to be “enlightened” (128), prior to the deliberation, through a rational assessment of the possibilities and consequences of the relevant paths of action.

This is the classic enlightenment demand to exercise reason and be autonomous. In the first stage of collective decision making, ‘impulses’ and ‘desires’ are developed into ‘projects’ based on their persistence and how integral they are to the individual. In the second stage, the individual considers the evidence to generate rational ‘interests’ to argue for in the political domain. Finally, the egalitarian deliberation takes place, in which egoistic interests are made compatible by generating a consensual solution. This part of Kitcher’s ideal procedure of decision-making is similar to a liberal democratic mode of politics as an undistorted discourse amongst a community of rational equals but without the competitive politics of voting. It should be noted that, Kitcher reserves the term ‘politics’ for partisan politics that lack adequate negotiation (102, 164, 178, 182), which is put in contrast to the ideal situation.

There are several, non-ideal, components to the ideal deliberation. Kitcher’s egalitarian premise demands increased consideration of marginalized perspectives. This appears to be the driving reason behind designing the conversation as a hypothetical procedure, as actual conversations would reproduce the real power differences, which Kitcher understands as distortions to be avoided.

The “index of human needs” (128) exemplifies how the proclaimed pragmatist and clearly discursive approach is undermined by a rationalist’s desire for completeness. Such a collection of settled preferences ought to be composed to act as a reference for all further decision-making. This appears to be nothing less than a complete account of the diverse nature of man. If the autonomy of the individuals is not to be violated, the account must be revisable, which turns it into a function of all interests. Furthermore, unless that index is specific to a certain issue, it would only perpetuate the objectivization of ends, which Kitcher tries to avoid using a pragmatic

perspective. Hence, such an index would need to be complete, revisable, and specific. That would be equal to the ideal deliberation.

Kitcher's aim of a panhuman conversation, "embodying all human points of view" (106) or "perspectives" (116) including future humans (50, 116) only exaggerates the problem of adequately deliberating, because it requires consideration of people that have no interests. Autonomy requires the possession and manipulation of interests. Thus, future generations do not have interests in this sense. 'Not wanting to die,' for example, can be considered the same strong interest for, e.g., elderly people in the affluent world, malnourished people in developing countries, and various sentient animals, whereas it is absent in future or comatose humans – as discussed in contemporary accounts of utilitarianism (cf. Pfeifer 2009: 52–55). Since Kitcher considers some interests as higher in priority, it can be assumed that the ideal structure would not only provide a forum for enlightened decision-making but result in a set of basic rights.

Kitcher explicitly discriminates in favor of the human species as the discourse community. In the same way as humans that are incapable of participation, sentient animals should be "included through representation by involving people who know them intimately and who are devoted to their interests" (132-133). For these trustees, similar conditions legitimate their representation that were identified previously as being essential for his concept of egalitarian decision-making: intimacy, which is a communication of and about interests (openness and reception), and compassion. The more information was shared beforehand, the more likely a path of action might be acceptable to the represented if they were to enter the conversation. Nevertheless, to decide in the likeness of another remains an emulation of the subject and is justifiable only for a limited range of relations and issues. Future generations can obviously only be stereotyped in the most basal terms.

Some loss of information and autonomy is inevitable for any kind of representation. The objection raised against elected representatives, that they are not likely to stand for the full set of preferences of any person (80-81), applies to any reductive account of interests. Analogous to Kitcher's view on the representation of the world (cf. Kitcher 2001: Ch. 6), all representation is dependent upon a specific purpose. Just as no map can represent the terrain completely, no index can represent the interests of all people.

The same applies if representatives are chosen only by resemblance with their constituents. The assumption is that this would increase trust in the decisions made; trust that is continuously declining under the current mode of delegation. This trust would need to be based on the representative's resemblance to the community.

The selection of discrete sets of people may be possible along the perspectives on a given issue. Theoretically more challenging is the required capacity for transformation in a

deliberation. When prior ignorance of needs or facts is remedied in tutoring or deliberation, the refined preference of the representative loses its resemblance to the ignorant preferences of the constituency. If there is no active authorization of representatives, in addition to their similarity with the community, the relation of representation collapses at this moment of development. Representation on the grounds of similarity with the constituents, thus, creates the expectation that the ignorant positions persist, which is not acceptable under the conditions of the deliberative ideal.

There cannot be a discourse between points of view or perspectives because they are static. If representatives waive their autonomy to embody a static perspective, they cannot have sympathy for others or communicate and refine their interests. This point needs to be stressed because the procedure would change from discursive negotiation to utilitarian calculation.

In general, a representation that matches some state of preferences at a given time may be trusted but it is undemocratic unless it remains mutable in deliberation. The issues with the representation of interests posed here show that a hypothetical procedure is incompatible with a deliberative approach.

Concerning the questions initially posed, Kitcher's ideal procedure generates a stereotypical collective will. To the extent that Kitcher designs it to have, it cannot be an actual exchange of people and thus remains his rational design. It thereby violates the primacy of autonomy, which is indispensable for Kitcher's view of democracy. This contradiction surfaces in Kitcher's paradoxical position that an ideal deliberation can be both unpredictable and never actual (Brown 2013: 393; Douglas 2013: 903). Kitcher simply assumes his specific egalitarian proposals would be the probable outcome of such a procedure.

Yet, as will be discussed in section three of this thesis, the threat of CC also provides an opportunity for developing a proper global community. It may be the first genuine case of an external impulse that demands global action. As discussed above, external threats are integral to the evolution of communal living. In Kitcher's narrative, these external challenges might stimulate the ethical project. In terms of discourse theory, CC requires to find a structure for rational ethical discourse on the global scale, which is the transcendental foundation of global ethics (Apel 2000). Nevertheless, negotiating interests on a global scale is not comparable to the prototypical situations discussed above. As Dupré observes, scaling up the authoritative conversation to a global community is exactly the current problem. Hence, Kitcher's thought experiments "too accurately reflect the actual obstacles to agreement on an issue such as climate change" (Dupré 2013: 410). P

Based on my interpretation of the ethical project in the previous subsection, progress requires proceeding towards an ideal discourse community. However, Kitcher designs his ideal

after a fundamentally different discourse community and it is unclear how the features of a collaborative negotiation can be retained under the present conditions. Hence, the proper question needs to be how a diverse global community can be communicative and compassionate, i.e., what a genuine global community could be like.

2.4 Public Knowledge

Kitcher's ultimate research interest is the way science contributes to a global discourse community. As discussed in the previous section, Kitcher's ideal conversation requires the individual participants to possess knowledge of two kinds: the interests of other participants and facts pertaining to the issue. The former information is shared in the ideal conversation; the latter is found in the body of shared knowledge. Kitcher thus maintains a functional, but interdependent, fact-value divide.

Kitcher calls his position a "modest realism" (STD:17), which might alternatively be called 'moderate constructivism.' Categories, and thus perceptions of types, are considered to be culturally acquired but experience advances knowledge through the reconceptualization of representations that do not match the external world. Natural kinds may exist but there is, historically, little reason to assume that our current categories match those (STD Ch. 2 & 5).

Kitcher's conception of science emphasizes the instrumental aspect of knowledge for the community, which means that, ideally, the production of knowledge should accord with the needs of the deliberators in the conversation and with the collective will generated therein. The central concepts in Kitcher's account are the system of public knowledge, well-ordered science, and the division of epistemic labor. The central questions to pose here are whether the proposals treat the fact-value divide in a manner that promotes autonomous refinement of interests through knowledge and collaborative global decision-making.

Kitcher's genealogy of ethics outlines how professions and organized knowledge emerge out of cooperative ventures and evolve into a highly sophisticated social organization. Of foremost interest here is that collaborative activity requires some kind of shared knowledge. The inevitable information gap between individuals is the source of a "primitive" division of epistemic labor (86, 44). The division proper occurs when someone begins to manipulate the content and boundaries of a system of public knowledge (86-88). Kitcher sees the first such manipulations in "norms of sincerity and competence" as a response to perpetuated falsehoods and lore in the oral tradition (87-89).

The classical era introduced the idea of knowledge as an end (95), which was subsequently equated with knowing the Christian god in medieval times (96-97). With the rise of professions

that mastered esoteric skills – especially writing – appear social casts in the early high cultures (90-93) and, much later, the gentleman-scientist communities (98-100). Throughout history, knowledge was created and shared overwhelmingly undemocratic. Increased specialization limits contribution and validation of content to a small educated minority, which often profits substantially from their privileged position (85, 93). The departmentalization of the SPK into specialist domains expands its content but limits both contributory and receptive access.

Whatever the particular composition, some shared and thus externalized knowledge is common to all these forms of organization. Kitcher considers sharing knowledge integral to the ethical project because it provides additional instruments for solving problems (‘innovation’) and the means to evaluate goals and means in the deliberation (‘evaluation’).

Kitcher defines the SPK as “that body of shared knowledge on which people draw in pursuit of their own projects” (85), properly limited to the part of it that is “actually true” (87). The SPK thus maintains a “depository” (91) of facts and epistemic norms by which those are validated.

The SPK is a central structural element in SDS. It is described as being composed of four stages of interaction with the depository of facts (89-91). “Investigation” refers to the selection of goals for inquiry, as well, as a specification on means and constraints. “Submission” deals with the actual contributions, i.e., the qualities of contributing agents and the knowledge they provide. “Certification” considers acceptance, storage, and elimination of knowledge in the depository. Finally, “transmission” considers the limitations of access and modes of distribution.

All of these involve value-judgments and should, therefore, be subject to democratic control. Kitcher considers science to be the obvious custodian of the SPK because it creates the most reliable knowledge, as proven by manipulative and predictive successes (157). Consequently, most of the argument in SDS discusses issues of value judgments in relation to science only, therefore the analysis is focused on the interactions between the ideal deliberation, the SPK, and science.

As discussed previously, the discourse community requires external knowledge at several stages in the ideal deliberation. Conversely, the production and application of knowledge require communal value-judgments at various points to be significant. Kitcher’s pragmatism allows for this overall dialectic relation between the political and the scientific domain because there is no primacy of present ends or facts⁶.

The particular exchanges are designed as unidirectional transfers of facts or judgments. Science and the SPK are epistemically privileged and the ideal deliberation has the authority

⁶ Although, as discussed previously, Kitcher’s ethical project equates a particular mode of social organization with the general good.

over value-judgments. The elitist “deficit-model” of science communication evident in Kitcher’s practical proposals is thus a deliberate feature rather than a “slip” (Brown 2013: 394). It is one of the fundamental assessments in SDS that a complex human society needs specialists, designated to know better. While the public determines the values guiding science, science determines the facts guiding public deliberation and action.

In the ideal conversation, there are two ideal and one obvious non-ideal procedural interfaces for external knowledge. On the one hand, prior to the negotiation, the transformation of preferences requires knowledge of facts and alternatives. Ideally, individuals enlighten their own preferences prior to deliberation. In a non-ideal approximation, the peers would additionally need to evaluate each other’s preferences during the deliberation (165). In both cases, easy access to knowledge pertaining to the issue is required.

On the other hand, the direction of innovation has to be guided. This is the process of investigation. An ideal deliberation would start with settled preferences then have representative participants tutored on the opportunities and probabilities of further research so that they arrive at tutored preferences (115-116). These would be deliberated on, in the manner discussed previously, so that the participants arrive at refined preferences. This leads to the ideal of a well-ordered science: “[S]cience is well ordered when its specification of the problem to be pursued would be endorsed by an ideal conversation, embodying all human points of view, under conditions of mutual engagement” (106). A problem so endorsed would be of social significance. Science is only justified to be the privileged epistemic institution if the direction of research accords with this public will. Thus, as a consequence of the previous sections, a science of authority can only be an egalitarian institution.

Decisions, ignorant of facts, cannot be considered “free,” because these limit the individual capacity to pursue their goals (180-183). This is the reason Kitcher rejects both free discussion (180-183) and Feyerabend’s demand for unconditional public control over science (139-140, cf. Feyerabend 1982: 96–98). Such “vulgar democracy” lacks the mediating element of knowledge that promotes better judgment; it would promote a “tyranny of ignorance” or “mob rule” (139-140).

Deciding on research goals ignorant of prior or similar attempts would be an irrational waste of resources. Only experts are considered able to provide “significance graphs” that inform the deliberating public about possible outcomes and opportunities for specific paths of inquiry (STD 117-118). A complete collection of such graphs would be an “atlas of scientific significance” (127). Thereby, deliberators would be enabled to select a promising agenda matching their settled preferences. Even more than the previously discussed index of human needs, such an atlas is impossible. The complete atlas would need to provide all research paths,

opportunities, and their significance as required by every conceivable person because otherwise certain positions are marginalized.

The knowledge required for evaluation is of a destructive kind. Secularity, Kitcher assumes, is linked to discovery and showing “the reality behind old illusions” (166) and is, thus, a necessity to increase the adaptability of participants in the conversation. The autonomous individual needs to be able to acknowledge when the premises are false. Kitcher is verbose in his attack on religions, which satisfy basic human needs but only at the cost of irrational dogma (156–161, 165–168). That could be considered a violation of liberalism and value-pluralism (Bätge et al. 2013: 85–88). Yet, it is only the justification of religious preferences exclusively through tradition that is considered incompatible with collaborative reasoning. Moreover, I tried to show that Kitcher’s views do not simply fit into the liberal tradition.

Kitcher proclaims that, as soon as the decisions affect the lives of others, “the willingness to leap to a standard for judgment, to commit yourself in the absence of reasons, deserves *ethical scrutiny*” [original emphasis](160). It is a failure of the public certification of knowledge if a “chimeric epistemology,” i.e., claims to knowledge based on infallible scriptures, is allowed to compete with arguments based on knowledge derived with secular procedures (157–161). Scriptural revelation supports the arbitrary denial of otherwise accepted epistemic procedures. Like all dogmatism, it is a kind of reasoning incompatible with the ideal deliberation. Considering the qualities necessary for ideal participants, as developed in the previous subsection, dogmatic participants primarily fail because they rely on knowledge of questionable validity and cannot revise beliefs prescribed by dogma.

The strong influence dogma can have on large proportions of the population causes Kitcher to propose mandatory warnings for firmly refuted dissent (222). After due consideration, any audience should be made aware that they are listening to a mere reiteration of dissent that disregards contrary evidence. Even more controversial, Kitcher demands secular substitutes for the functions religious institutions provide as these functions allow the dogma to persist (165–168). This demand to frustrate unsustainable prior beliefs is strong evidence that Koertge is mistaken to call Kitcher’s ideal “communitarian” (2013: 1119) because particular traditions are of little value to both ethical and epistemic elements of this ideal discourse. Kitcher considers the ideal conversationalist to be mature and reflective enough to reconsider beliefs in light of substantive evidence. In a non-ideal deliberation, these beliefs have to be scrutinized during deliberation or the source of dogmatism remedied by political intervention. Any approximation to the ideal conversation needs to create the conditions under which the conditions of a rational and egalitarian debate were not violated, even if that goes against the beliefs of substantial parts of the population.

The epistemic privilege raises suspicion of heteronomy. The value-judgments needed for the SPK are ideally the result of such well-informed and considerate deliberations. They are not the prerogative of scientific institutions or the individual researcher. This distrust is based on the perceived illegitimacy of value judgments, which are inevitable in knowledge production. Therefore, “[t]o restore public confidence in Science, the problem to be solved is that of locating and eradicating the bias of illegitimate values in a way that convinces the outsiders that this has been done” (146). Value-judgments are legitimate if they align with the ideal collective judgments and this alignment needs to be transparent enough to establish trust in the knowledge produced⁷.

As a consequence of the above, the motives currently guiding research become less relevant. Curiosity, ambition, or disciplinary quests are then just the preference of a single person or a fact about the social mechanisms at work in science (107, 124, 134). These mechanisms have to be considered in devising research strategies (120, 193-197, 203). Attaining knowledge for understanding, in particular, is justifiable only through its potential in attaining practical improvements (107, 171, 196).

The value of such goals of epistemic significance must not be neglected but they cannot be a justified purpose anymore. Nevertheless, Kitcher discusses “pure knowledge”⁸ as something that is highly valuable in itself (174). The prospect of these problems of purely epistemic significance motivates researchers and creates an appreciation for the scientific tradition (191). Kitcher clearly understands science as a cultural achievement, even though that cannot be a normative argument.

Closely related is the counterintuitive esteem in which Kitcher holds Vannevar Bush for initiating the post-war era of institutionalized scientific autonomy in the U.S. (112, 118). The separation of science and democracy that emerged there seem to be in fundamental conflict with Kitcher’s integrated structure. The famous “social contract for science” promised that unregulated scientific research would provide more commodities, health, and wealth (Kitcher 2001: 139–141, cf. Bush 1945)⁹. This materialized primarily as commercialization (Brown 2009: 9–10). Science was put in debt of particular values while institutional separation implied a value-free science. This development increased the standing of science, but it also prepared for the present distrust. By defining science as the social institution behind cultural progress, it became accountable for the absence of tangible results.

⁷ See the discussion in section 2.1

⁸ Qualified in SDS by apologetic quotation marks.

⁹ The U.S. president Roosevelt sought advice on “how scientific research might be used for the improvement of the national health, the creation of new enterprises bringing new jobs, and the betterment of the national standard of living”(Bush 1945: 8–9).

Kitcher reprimands the “misleading advertising” (173) that is used in competition for funds because research possibilities need to be assessed soberly. Yet, exaggerated expectations of practical application, such as with genetic research, can be understood as a necessary consequence of the promise made in the informal contract. The gentlemen scientists probably would have deferred publicity until some demonstration was feasible. In an ideal deliberation, this overselling would need to stop. The research possibilities presented would have to follow similar criteria as the participants, especially being honest about the possibilities.

The second stage, submission, has an odd place in Kitcher’s four-step model. The ideal judgments there are not discussed in as much detail even though it touches the central question of what defines an expert.

Questions regarding submission are supposedly concerned with the contribution of knowledge to the SPK: whom to grant the privilege to submit knowledge, on what topics, their training, and the standards for their investigation (90-91). Section §21 (“constraints on pursuit”) deals with questions arising “at the phase of inquiry that follows the setting of the agenda” (131) before the discussion of certification in section §22. However, because the correct scientific procedure is already a matter of certification, contributions to the SPK have to be certified according to the “methodological guidelines” devised there (148).

Other questions are primarily ethical constraints, which are elsewhere considered part of the investigation stage (91), and considerations about the relation between research optimization and obligations of researchers. The internal mechanisms of science are discussed primarily under the heading of “diversity” (esp. Ch. 8). Thus, it appears ‘submission’ is an umbrella term for the various aspects of inquiry not related to defining ends or managing results. I will consider the necessary judgments for ethical constraints, the privilege to contribute, and the choice of research strategy separately.

The examples of ethical constraints show two classes: obviously unethical conduct and specific cases. Kitcher presents racist medical experimentation and experimental child development studies as obviously intolerable (131). No explanation is given but the foundation of a discourse community clearly explains such cases. The subjects would be strongly adverse, and everyone would need to be sympathetic.

The situation in other examples is not as final. This includes such issues as animal experimentation or voluntary participation in dangerous experimentation (131-133). The ideal would require generating ethical constraints that accord with the public will and consider relevant possibilities and facts. Kitcher applauds the contemporary style of ethical consultation in science:

“Contemporary practice, especially in the biomedical sciences, already embodies a healthy approximation to the ideal and even the procedures I am recommending. [...] Institutional review boards provide good ways of elaborating and applying constraints on research. [...] decisions should not be made by wielding abstract principles (of the sort medical specialists absorb from simple philosophical textbooks and struggle to apply) but through deep immersion in the case from a variety of human perspectives. [...] Promising practices of research review could be improved by finding ways to bring deliberation closer to conditions of mutual engagement (perhaps by increasing the diversity of perspectives) [...]” (134)

Kitcher considers such advisory boards an approximation to the ideal deliberation because of the specificity of the deliberation, the immersion in the facts, and the thorough consideration of diverse perspectives. It is discursive, informed and egalitarian. The particular issue and a specific location in time and space provide the context in which individuals can be clustered by interests, rather than persistent characteristics. Not further specified modes of reasoning provide a wider range of options. The power relations in such committees are not addressed.

Diversity is discussed extensively with regard to the composition of the research community. Kitcher is aware of the historical and current limitations in joining the scientific community (199). He recommends an increase of diversity because of the inevitable judgments and “outside representatives [are not as good] at articulating the distinctive needs and predicaments of particular groups” (200). In addition to this political argument, the diversification of the research community has the epistemic advantage to provide alternative background assumptions. In the investigation of phenomena, this reduces blind spots and prejudiced assumptions (150, 200-201). This matches current insights in the philosophy of science. For example, it is largely in line with the emancipatory values for science that Helen Longino proposes (Douglas 2009: 90–91) or Miriam Solomon’s discussion of dissent as “epistemic desirability” (2006: 36) because that broadens the evidential base with alternative perspectives.

For the body of researchers, Kitcher states that an increase in diversity would converge on the ideal of a well-ordered science and that the ideal should not be understood as a “surrogate” for increasing diversity (201). This is a rare instance, where the ideal procedures are declared secondary to a particular practical improvement. In both ethical committees and scientific communities, diversification is necessary to reach a more balanced outcome, because the ideal that would govern in perfect balance is impossible.

For the optimization of research strategies, Kitcher presents personal ideals, explicit norms, and structural constraints as relevant factors (195-196, 208). The present allocation of credit is presented as productive but harmful (197, 203). The public does not perceive the nuanced internal differentiation and detaches merit from expertise. Consequently, some

scientists enjoy an “aura of expertise” (214) and claim the epistemic privilege on topics in which they are not experts. This is a distortion of the proper division of epistemic labor because there are others that would know better.

It is surprising that Kitcher chooses to discuss deliberate fraud in a similar manner, as a phenomenon to be balanced between impeding research and the deliberate introduction of illegitimate values (144-147). Such an approach seems to be detrimental to the idea of a depository of true statements.

Positive specifications of the qualities of scientists are sparse. Scientific training is only a necessary but not sufficient condition for being granted the contributory privilege. It is a non-ideal requirement for the privilege of contributing to an ongoing specialist discussion, due to limited resources in the processing of submissions (136-137, 140).

Requiring scientific training limits the contributions of laypeople to reporting experiences or menial tasks. Kitcher is mistaken to consider these a democratization of science, as such passive roles cannot actively introduce alternative value-positions. In the section on education, Kitcher perpetuates the binary distinction between scientists and laypeople (189-192). People on a scientific career path need to develop skills for reasoning, observation, data analysis, and experimentation. Everyone else just needs to comprehend the scientific facts they receive and embrace the importance of science. That an admiration for science should be taught is a problematic proposal. On the one hand, it sounds dangerously like indoctrination, which would be unacceptable. On the other hand, the importance of science should be evidenced in the continuous exchange about values and the utility of solutions provided. Without this experience, the trust needed to maintain a stable division of epistemic labor is absent.

Kitcher is not explicit on whether scientists should be personally certified as an authority for specific subjects or if that authority is a consequence of successfully contributing certified knowledge. It would stand to reason that any scientist is the primary authority regarding the particular facts they contributed. It is, therefore, the successful certification of a contribution that provides a scientist with authority and thus the epistemic privilege – regardless of prior training. There seems to be no necessity of attributing a contributory privilege in the ideal because contributions need to be certified according to methodological guidelines to be accepted into the repository of knowledge.

Kitcher discusses the large potential benefit of diverse approaches within a discipline as a matter of efficiency (193-195), but this does not contribute to the diversification of perspectives. To embrace contributions from outsiders of the scientific community is maybe ineffective, in terms of research pace, but it will certainly be productive in balancing and diversifying value positions.

Collins and Evans (2006: 41–43) propose a definition of ‘expertise’ based on experience and special skills, rather than the profession as a scientist. They present a lucid description of why it is the specialized knowledge a person draws from experience that should be the criterion for selecting experts. Regarding any issue, a person can have either no expertise, “interactional expertise,” or “contributory expertise”(Collins & Evans 2006: 48, 57-59). Those that actively engage with the phenomenon provide useful knowledge and thereby contribute to the SPK. Others can have the skills to engage with this knowledge or not. Most significantly though, Collins and Evans additionally discuss “non-certified” (alternatively called “experience-based”) experts who are not scientists (2006: 46). Localized observations are important contributions to aggregate human knowledge. Even if those are derived by non-scientist, they are relevant expertise nonetheless: specific and non-trivial knowledge about a subject.

An interesting example is presented by Groth (2001) regarding false but certified medical knowledge about the female sexual organ. Medical textbook knowledge at the time of publication still reproduced the misogynist ignorance of the 19th and early 20th centuries. Independent from medical research, accurate information has been researched, collected, and published since 1970 by the Women’s Health Movement. This knowledge should have had a large impact on medical practice. The fact that it did not can be attributed to institutional gender bias or the unwillingness to consider even substantial knowledge contributed by outsiders.

In this example, a deficit has been actively remedied by those requiring the knowledge, because the medical community did not. In response to the failure to remedy this deficit by the official epistemic authorities, an alternative knowledge system was established. For exactly such an issue, aligning the individual researchers’ agenda with public need, Kitcher proposes an ethos to require “periodic reflection on their actual and potential contributions” (217) for the area in which they work. This non-ideal norm is far from the ideal, in which there would be external governance of research agendas. Also, Kitcher observes elsewhere that norms work best if they are easy to follow (211), which is not true for this norm, because it would require something like the index of human needs to help the researchers avoid blind spots. Alternatively, a norm that welcomes contributions from outside the scientific community would provide an opportunity to diversify and realign research efforts with public interest without relying entirely on the virtue of individual researchers.

More generally speaking, if science, in its elitist configuration, is to remain the primary epistemic authority, then science must actively seek to incorporate reliable knowledge generated outside its institutions. Otherwise, science is bound to overlook entrenched biases and necessary questions to investigate.

The stage of certification is a novel element compared to *Science, Truth, and Democracy*. There were already three stages of inquiry identified for which public judgment was warranted: Allocation of resources, pursuit, and application (STD 122-123). These correspond largely with the phases of investigation, submission, and transmission.

The main reason processes internal to epistemic labor are now included for public governance appears to be the widespread rejection of scientific knowledge (146). A lack of trust is one of two “functional defects” (151-152) Kitcher identifies. If the knowledge is incorrect, it is unable to manipulate successfully. If it is mistrusted, it is rejected and consequently also unsuccessful.

Kitcher posits that “a democratic society needs a shared notion of public reason, a common agreement on what kinds of evidential considerations count and on their relative weight” (167). This is the epistemic equivalent to the notion of a public will derived through the same kind of deliberation. The SPK maintains a depository of true statements. The stage of investigation specifies which statements are needed and the stage of certification specifies the truth of these contributions. Kitcher allows for different standards for the various fields of research. Following reliable methodology supposedly “generates correct conclusions” (148) and, by the same guidelines, the conclusions are certified.

As discussed initially, Kitcher deals with the certification of knowledge in two ideals: well-ordered certification and ideal transparency. Well-ordered certification requires the ideal deliberation to agree on a “range of reasonableness” (149). This range of reasonableness is a specification of “reliability” for judgments, which consist of two parameters: “Reliable standards and processes are those giving rise to conclusions that are true *enough*, at a frequency that is high *enough*” (148). Kitcher specifies further that these various standards are basically different research strategies, favoring either quick or stable results (203). Ideal transparency would be met if everyone could agree with the procedures and judgments used in certification – surprisingly without a prior refinement of interests (151).

There are several, closely related, issues with these ideals. The first problem lies in the missing refinement of interests for ideal transparency. It is inconsistent to demand that everyone has their – possibly vulgar – standards met. The significance of problems is allocated in an ideal deliberation which may overrule specific individual interests. Contrary to Kitcher’s explicit stance (151-153), it cannot be ideal to have a system of public knowledge set up for everyone’s private standards. This is not a matter of feasibility, but one of elevating democratically negotiated positions over individual positions. As discussed above, dogmatic belief formation, for example, conflicts with basic democratic reasoning and can therefore not yield valid standards for public knowledge generation. The ideal of “evidential harmony” (151, 186)

obtaining in public certification procedures is thus incompatible with Kitcher's ideal conversation.

Secondly, Kitcher makes the general mistake that was already exposed by Rudner (1953: 4). Rudner argued that it is not objective, in the strict sense of avoiding judgment, to avoid accepting or rejecting a hypothesis and only providing the level of probability. The determination of accurate levels of probability is, nevertheless, accepting a hypothesis that the level of probability is true. This, however, appears to be the assumption underlying Kitcher's proposal to provide generic levels of probability or proximity to the truth. Even if such levels can render judgments less arbitrary, the judgment that those levels are met is not removed from the investigator. The process thus remains vulnerable to challenges concerning the values of the investigators.

These judgments are not inevitable, but necessary in practice. Scientists could present a highly nuanced account of their belief and thus avoid making such a choice, but for pragmatic reasons, they will need to translate their complex belief into a tangible form (Steele 2012: 896–899). Put facetiously, a researcher could hand over their raw data, but that would be of little use to others.

The highly simplified examples that Kitcher advances, in which the notion of proximity to a true value makes sense, are not at all representative for the problems faced in policy decisions. As Bluhm (2012: 3) comments, the more complex problems are, what counts as an answer to a scientific question depends crucially on how the question is framed. Therefore, a negotiation of criteria requires a particular answer for anything but trivial cases.

It is a central premise in this argument that science is valued for its utility in solving communal problems. Researchers asked for advice are required to deflate all their data and judge whether the evidence warrants certain practical conclusions. Thereby value-judgments that are implicit to the research are naturalized.

Similar issues of deflation of knowledge occur during what Kitcher calls “higher level of certification” (147), i.e., the inclusion in textbooks, in teaching, and public communication. As Collins and Evans observe, “[c]ore scientists are continually exposed, in case of dispute, to the counter-arguments of their fellows and, as a result, are slow to reach complete certainty about any conclusion. In general, it is those in the next ring [...] – the non-specialists in the scientific community – who, in the short term, reach the greatest certainty about matters scientific” (2006: 50). Which happens because they receive digested reports from the core group, the few scientists actively research a particular matter. The public is even more remote from the particular research situation.

The process of knowledge creation, with all the corresponding disputes and tacit decisions, is experienced by those involved, who should, therefore, be able to give a detailed account of the decision and possible alternatives. Research at this stage is therefore potentially highly transparent. As the dispute is settled, a state of normal science is entered and information that is not translated into propositional knowledge, methods, or tools is lost to others. Thus “the nature and history of science are turned into a mythology” (Collins & Evans 2006: 52) and knowledge becomes decontextualized.

So, as the third and most substantial problem, a depository of facts is not pragmatic, because it removes facts from their context. To apply such facts to a novel problem, the original context and decisions have to be either reconstructed or ignored. The second alternative simply perpetuates the naturalized judgments and is therefore not acceptable in this ideal. For the public to draw on these facts, they would require an interpreter able to explain the judgments made, i.e., someone from the core group, or reflective personal accounts, supplementing the facts, to arrive at an immersed comprehension of facts and their value-laden aspects. Assuming that most controversial facts come from contemporary research, consulting researchers directly seems preferable to a reconstruction.

Kitcher’s desire to create a single authoritative system of knowledge appears misguided. First of all, the general issues on reasoning and knowledge seem to conflict with the particular and instrumental approach employed initially. Kitcher calls his definition of reliability, as a range of reasonableness for the reliability and validity of procedures, “thoroughly pragmatic” (148) because it does not define absolute levels. However, to be pragmatic in the sense used throughout this thesis, processes of certification need to reflect the significance of the matter under investigation and therefore be specific to the particular research. All research of strictly epistemic significance might have such standard levels for certification, but these are of little public concern. As soon as there is social significance to consider, the particular standards need to be democratically controlled. Closely related research could be subjected to markedly different standards if there is a difference in social significance. As reported above, Kitcher praises the undogmatic and particular work of bioethical boards exactly because these do not rely on abstract ethical principles and consider plural views on the particular problem.

As mentioned, this already touches the fourth stage of research, at which the knowledge created is distributed. Laypeople need to access reliable knowledge for their own projects and for participating in public discourse. Knowledge has to be communicated, received, and applied.

This authoritative system of knowledge encourages pluralism only in steps prior to certification. In application, a plurality of accounts is to be avoided, as that would weaken the utility of that knowledge. While this can be viewed as a problematic oversimplification of the

issue of pluralism (Bluhm 2012: 3), Kitcher considers dissent, in particular from outside the specialist community, as a distraction from implementing the solution to an ideally specified goal (171, 218-219).

The primary concept at this stage is ‘ignorance.’ If the knowledge created is not received, then the ignorant people are limited in their autonomy due to a lack of options. People need to be able to recognize the issues relevant to their goals and to acquire knowledge about these. This feeds into the practical issue of urgency. The division of epistemic labor has failed if expert assessment about the urgency of a threat is ignored by the public (171). In this case, awareness of facts and the judgment of significance rest entirely with the specialists who become aware of an issue. Once again, it is unclear how this would fit with the ideal deliberation, which is unable to handle temporal constraints.

Kitcher discusses three types of ignorance (181-182). “Remediable ignorance” means that the individual is able to locate sources and learn for themselves – presumably by accessing the depository of facts. “Indirectly remediable” is the ignorance of individuals who lack the skill to learn for themselves but know how to locate experts. “Irremediable ignorance” obtains with those individuals who can do neither.

Scientific knowledge can be distributed by the media, by scientists, and through educational institutions. In addition, Kitcher proposes to immerse laypeople in scientific work so they can act as mediators between science and the public. This will be discussed in the following section in detail.

Science education in SDS includes processes that aid the reception of reliable knowledge and thereby reduce ignorance and, if applicable, technical education to develop the skills needed for a scientific career. For the former, Kitcher demands to develop basic reading skills, insight into the intricacies of scientific disagreement, the ingenuity and impact of past scientific work, and the conviction that policy requires expert advice. Insight into scientific work and historical knowledge are supposedly required for building trust in science, whereas insight and reading are fundamentals for remedying ignorance. (190-191)

For non-ideal conditions, this short list of skills seems to lack fundamental reasoning skills required for responsible decision making, as discussed in the last section: a rejection of ethical heteronomy (167), the maxim to develop the privately important questions and answers to that question (180), caution about being distorted by distractions or diversions (i.e., unidentifiable oppression), or a primer on rhetoric for navigating the persuasive forces in a public debate (177-178).

The difficult issue with these basic skills and Kitcher’s model lies in the tension between the social character of knowledge creation and individual agency. Kitcher considers autonomous

removal of ignorance unrealistic (181) and, hence, develops an authoritative system of public knowledge. However, these individual skills I just added – and others – are presupposed in the ideal conversation, making such a conclusion incoherent. Only if science were governed ideally, could it have unquestionable epistemic authority. Kitcher is outspoken that his ideals are impossible but suggests conferring such authority to the institution of science nevertheless.

Consequently, Kitcher aims to reduce resistance against expert judgment. Science ought to be more transparent about the values employed in judgments (164) and to consider public objections within their own procedures (219). Communicating how and why certain decisions were made provides the public with the option to agree, which Kitcher assumes they would in general. Curiously, Kitcher also approves of withholding preliminary results if they are likely to cause hasty responses, which is contradictory to transparency (Brown 2013: 395), although it seems to fall within the proper authority of the investigator to judge an argument ready for publication or not.

An additional advantage of scientists being transparent with value-judgments is that dissenting paths of research (214) and the illusion of controversy created by dishonest scientists (144) may be much easier to expose if they are not discussed in epistemic terms. The same is true for research in favor of egoistic interests, be it profit or curiosity (202). That, however, would require selfless humans.

For the transmission of knowledge, Kitcher favors scientists to educate the public directly, because mass media increase public ignorance, rather than reduce it (128, 183, 187-188, 245). Kitcher claims that their commercial nature causes them to communicate knowledge inadequately. Consequently, Kitcher considers the media another social institution that, in its current configuration, fails its purpose and therefore needs to be under democratic governance.

Indeed, financially it is beneficial to exaggerate controversy or focus on the people rather than the science. Journalism, as a social institution, is expected to assess the reliability of information and keep unwarranted arguments out. This so-called gatekeeping function is impaired by commercial objectives but alternative. However, the exaggeration of controversy can also be attributed to norms of quality. Boykoff & Boykoff (2004) analyze the consistent misrepresentation of the unequivocal scientific consensus on climate change and arrive at such a conclusion. Quality journalism maintains the norm of objectivity. Alternative viewpoints can be considered necessary to meet this norm and thereby overstate minority dissent. The issues with public media appear similar to those experienced in science: exaggeration and a false sense of objectivity.

For practical application, it would be necessary to investigate why scientific sources failed to cater to the public in the past. One and a half centuries ago, the periodical *Nature's* “first

stated objective was ‘to place before the general public the grand results of Scientific Work and Scientific Discovery, and to use the claims of science to a more general recognition in Education and in Daily Life’,” and only secondly to aid scientific investigations (Harmon & Gross 2007: 238–239)¹⁰; so did *Science* in the US. If the leading scientific journals today originally intended to distribute reliable scientific knowledge to the public but abandon this mission now, while the authority of science erodes, this path does not look promising.

2.5 Citizen Juries

The argument culminates in the suggestion to institutionalize citizen juries to bridge the gap between the scientific and the political sphere. Kitcher proposes to progress through a quasi-ideal conversation within a mirror-public, because “a philosopher who proposes an ideal should be able to point to the initial steps we might take”(125) for this ideal to be meaningful in a pragmatic theory.

Kitcher uses various terms and descriptions to refer to these citizen juries. Groups of “citizen representatives” (128), “citizen juries” (222), “oversight groups” (186), and even – maybe facetiously – “council of impartial citizens” (222). While the terms vary, these appear to be the same groups assigned with various tasks regarding the system of public knowledge. They will be referred to collectively as ‘citizen juries’ throughout this thesis. There is also mention of “deliberative polling” (225) as an alternative mode of citizen involvement.

The citizen juries are structured to approximate the ideal conversation in three aspects. First and foremost, the juries are well informed. They receive tutoring on the present state of knowledge in a particular field of science and are introduced to internal procedures, methods, and available counterarguments (128, 186, 207, 225-226). Thereby, Kitcher supposes, they comprehend the certified knowledge and its rationale, for a selected field of research. This removal of epistemic ignorance is their primary task so that they can function as mediators with the public (185, 219). Their informed state is also the precondition for having a free debate amongst each other.

Secondly, the jury members are proponents of the various points of view in the population on a given issue (185-186) and they are not experts – they are “outsiders” (222). Kitcher does not specify how these representatives ought to be selected, except that they represent a large variety of distinct points of view. Concerning the numbers, Kitcher remarks that there should be more deliberators than in the citizen juries of the Jefferson Project, which

¹⁰ *Nature*’s original mission statement from 1869 has been revised in 2000 and now explicitly prioritizes scientific exchange over public education (<http://www.nature.com/nature/about/index.html> [20.08.2017]).

uses groups of 18 to 24, to include all affected perspectives (224). The assumption is that such diverse juries will be accepted as legitimate representatives of the people. Therefore, in contrast to the expert elite, their assessment of scientific knowledge will be accepted as well.

Thirdly, the juries ought to govern processes of knowledge production and knowledge transfer. Examples given are rulings on technical controversies that cannot be decided within scientific reason (177-178), defining standards for the media (186), “scrutinizing certification procedures” (187), especially regarding their value-judgments (219), “supervising and appraising sources of technical information” (187), the selection of productive levels of diversity within scientific communities (207), and – as “grand juries” – the official delegitimization of unproductive public (219-222). In these functions, the citizen juries are clearly more than just mediators. They would shape the production and distribution of public knowledge and have to be considered a new democratic institution.

When considering the characteristics of the ideal conversation, these juries resemble the ideal insofar as they can be considered in a beneficial situation to make refined decisions: Their compact nature allows for a compassionate deliberation and the close involvement in epistemic processes provides unmitigated access to relevant knowledge. The selection of representatives for distinct perspectives strengthens minority positions, which is beneficial to an egalitarian approach. The individual cognitive and affective components of the ideal conversation are not discussed. Apart from the direct access to scientific knowledge, there is no specification about how to implement the conditions of mutual engagement.

Problems with these citizen juries are the justification based on ideal considerations, the prescribed tutoring, the mode of representation, and their function as a democratic institution.

In political theory, the questions posed by a non-ideal theory are how to treat non-compliance, matters of feasibility, and long term approximation of the ideal (Brown 2013: 396–397). Kitcher’s ideal of full participation is impossible to realize as Kitcher repeatedly states (51, 79-80, 115). Yet, the theoretical issue of how to derive practical recommendations from ideal constructs is not elaborated. In particular, the ideal deliberation invariably fails to generate specific directives, because individuals cannot be rationally modeled without negating their autonomy.

Considering Rawls’s ideal theory again, an explicit and attainable ideal has to be considered the goal. The ideal and guiding principles for social institutions are distilled from the sentiments of the liberal populace, so that they may actually be endorsed (Simmons, A. John 2010: 7). Such modeling begins with a plausible psychological profile of the people and follows through with the implications. If the ideal state is the goal, then particular choices need to be evaluated by their contribution to attaining this state. Intermediate states that are less just are consequently

necessary if such a state is required to attain a superior state in consequence (Simmons, A. John 2010: 35–36). As I tried to show in section 2.2, Kitcher’s ethics necessitates working towards a certain ideal social structure as well.

The ideal deliberation, however, does not coincide with that authoritative conversation amongst equals. The ideal state itself is impossible to attain, so any actual target state can only be an approximation. This is clearly evident in the stages of submission and transmission of the SPK, for which there are no comprehensive ideals proposed at all. The underlying discourse ethics could not be expanded to include an epistemic authority and, consequently, the deliberative aspect is reduced. In one instance, Kitcher explicitly prioritizes increasing diversity over the contemplation of a well-ordered science. While this will certainly be beneficial to overall egalitarianism, other issues, especially those regarding representation, remain unchallenged.

In a review of deliberative democratic approaches, Bohman suggests to focus on feasibility as a normative element: “more than just practically necessary devices or second-best approximations, they must be the best way of achieving widespread deliberation in a large and diverse citizenry” (1998: 412), because this improves democracy. This requires that deliberative democratic concepts consider the current democratic institutions such as voting and delegation because that is the current context on which to improve on.

Delegation, the power to decide, is a necessary part of “a complex, *democratic* division of labor” [emphasis added] (Richardson 2014: E-109). A design for a new democratic institution would need to consider how to establish public credibility and legitimacy (Brown 2013: 394). Maintaining public credibility is central in Kitcher’s final proposals for the organization of such juries (222–225). However, Kitcher merely assumes legitimacy, manifest as trust, to be inherited through resemblance with the ideal deliberative procedure.

Kitcher refers to only two examples of participatory democratic processes (the Jefferson Project and James Fishkin’s account) (130) and recommends further experimentation (125), whereas Brown reports that there is already “an enormous literature on citizen engagement in sociotechnical controversies” (2013: 393) to be drawn on. Bohman (1998: 420–422) reviews a few empirical studies that show how deliberation may be efficiently established. One surprising observation is that the US Congress used to be a much more deliberative institution, decades ago, because of informal norms promoting cooperation and trust, as well as less publicity. Debates under public observation tend to be less cooperative and less open about self-interests. This corroborates the assumptions made about the elements of responsible decision making. Collaborative decision-making, aiming at a solidary agreement, requires candor and proximity, but not publicity.

In contrast to current modes of political organization, the members of the proposed committees are not electees. The assumption seems to be that citizens without an entrenched agenda would be able to work towards a consensual solution, while the confrontational style of professional politics – not only in the US – prohibits this. It can be expected that, if such juries were equipped with the power to make legally binding decisions, everyone involved would be under the same kind of pressure that political actors always are: “the lobbying, bullying and bribery” (Wilholt 2014: 170). However, this kind of pressure will persist, no matter what institutions make binding decisions. It is possible that such a body of semi-professional committees might be more resilient to these pressures than career politicians. That would be an issue to investigate.

A connected issue is the necessary tutoring about the facts pertaining to a situation. One problem is the collapse of representativeness discussed at length in section 2.3. Kitcher predicts accusations that the participants have been “brainwashed” and thereby unable to represent the non-scientific public (223). Kitcher proclaims deliberative citizen involvement to be most successful when raising knowledge without skepticism¹¹. Yet, such an “objective primer” is impossible if it is accepted that knowledge cannot be fully objective, i.e., value-free (Wilholt 2014: 170). The difficulty is that “either the tutoring will be entirely inadequate to engender understanding, or it will effectively transform the ideal deliberators so that their ability to represent the outsiders is highly suspect” (STD: 125). The transformation is inevitable, however, because of increased knowledge about facts and interests.

It could be preferable that trusted representatives deliberate prior to tutoring. Thereby, the deliberation frames the tutoring and selection of experts, rather than the other way around. Considering the deliberative foundation on which Kitcher builds his argument, this should be the preferred order, even though that means accepting some initial ignorance and the uncertainty which sources of knowledge the citizen juries are going to draw upon.

Where certified knowledge is under debate, Kitcher dismisses the deliberative element found in the more confrontational tutoring of the Jefferson Project and prefers the rigid presentation and vote found in Fishkin’s deliberative polling, so as not to recreate the widespread confusion about trustworthy sources in public today (224). This, however, would negate the advantage of deliberative institutions. As previously discussed for ethical advisory boards, small and diverse groups are conducive to an actual exchange of interests. Thereby broadly acceptable solutions can be found. To cast a binary vote after deliberation has been

¹¹ Kitcher presents the misleading example of “explaining the structure of the budget” to find the right amount of US foreign aid (224). If the amount of foreign aid would be considered a function of its goals and not the surplus budget, the discussion would be extensive.

shown not to reflect the trust and comprehension of alternative views, which deliberation promotes amongst the participants (Bohman 1998: 417). Where the outcome of deliberation is restricted to a simple choice, the development of a consensual solution is abandoned. Then it would be questionable whether the term ‘deliberative’ indeed applies to Kitcher’s juries.

The integration of such citizen juries into present institutions, with their unique modes of representation and their functionality, should be a key consideration. However, this is seriously hampered by Kitcher’s distrust of present politics. For example, many of the functions Kitcher envisions for citizen juries are performed by politicians, who need to be proficient in negotiating between various interests and in acquiring reliable information, although they are not necessarily truthful about the content. Hence an approximation to Kitcher’s ideal could be a diversification of the body of politicians or an increase of collaborative boards in present institutions.

For example, the notion of ‘citizen juries’ could be taken literally: “The public arena does not function as a court in which ideas can be tried fairly and disputes can be resolved but in which it is not permitted to bring the same case twice” (221). Clearly, this quote expresses concern about the lack of resolutions in the public arena. However, this simile is flawed because courts do not try ‘ideas.’ It is the function of a court to resolve disputes by assessing whether the facts match a legal statute. It is conceivable that policies could be subjected to a trial by a jury of peers given their proclaimed purpose. Having the significance of the required knowledge anchored through a specific policy or statute could focus the discussion on evidence and implications. If designed akin to the juries in the judicial branch, such an institution could draw on their legitimacy. This, however, would probably preclude a controlled diversification.

Kitcher’s proposal that citizen juries should publicly repudiate dogmatic dissent introduces an element to regulate public discourse. It is not unthinkable to introduce standards of reliability for the media, for example through an expanded liability, and extend these to public speech. However, this will be received as an unjustified attack on the freedom of speech – a well-established institution. Judgments about the justification and functionality of policies would be much more specific in range and would not affect the public sphere in general.

The fictional ideal requires the whole of humanity to govern science. Miniature publics, the proposed approximation to the ideal, institutionalize external governance of aspects of science and knowledge transfer that are currently problematic. Because science is modeled as a deeply embedded social institution, the influence of these juries reaches far. The juries are composed of diverse laypeople, i.e., not scientists or professional politicians, to achieve egalitarian and nonpartisan governance. However, the immersion into complex topics and disciplines necessitates long terms for these councils, which allows for manipulation by interest groups similar to those experienced by current politicians. A strong conviction is expressed that these

councils would improve public acceptance of expert knowledge because they are more similar to the public than experts and politicians. However, political legitimacy rests solely on the assumption that the public perceives this as an improved engagement in technical decision-making. I tried to show that more feasible options may exist that have the potential to improve on current institutions and, therefore, would not require to build legitimacy from the ground up.

3 The Challenge of Climate Change

3.1 The Focal Topic

A brief justification is in order, why the topic of climate change was chosen over other examples before discussing the parameters of this challenge.

CC is the only of the four major topics Kitcher discusses in Ch.9 of SDS, that encompasses the full variety of issues identified and allows Kitcher's argument to be discussed to its full extent. It is also the only issue that depends essentially on scientific expertise, as there would be neither widespread awareness nor discussion without specialist knowledge. The projected impact is exceptionally high for the general population. As discussed above, this threat requires coordinated global action and, therefore, a global community that mediates value-conflicts. Besides, Kitcher identifies a few propositions that summarize the crucial knowledge, which makes it easier to discuss their justification as well as their reception in society and impact on policy.

The other examples lack some of these qualities. In the case of biomedical technology (230–237), the ethical dimension is very complex and a central epistemic question is missing. Prenatal diagnosis is closely related to the question of abortion, which in turn hinges on the conception of a person and what gives them worth. These easily conflict with considerations on the limits of individual freedom. Similar issues apply to stem-cell research and animal ethics or, in general, how to treat sentient creatures. All these problems are entangled in metaphysical assumptions, power relations, and ethical beliefs. As fundamental as these issues are, the topic is too complex for this thesis.

The debate of evolution (227–230) is not in itself a significant scientific problem. Instead, it is a symbolic assault, “an affront to the proper authority of Science” (228). As discussed in section 2.4 above, dogmatic beliefs distort the process of deliberating. If the theory of evolution can be contested, Kitcher argues, the position of science, in general, is in peril. However, as there is no significant problem for which knowledge about evolution is needed, there is no mandate to address the irrationality behind a chimeric epistemology¹². If it were needed, the rationality and irrationality of knowledge traditions need to be discussed by their contribution to solving specific problems.

The last example, genetically modified organisms (GMOs) (137–146) stands as an example of the technocratic perspective that Kitcher sometimes exhibits. GMOs are presented as a solution to world hunger because genetic engineering creates crops that are resistant to, for

¹² See p30.

example, drought and parasites. Because there are clear risks ahead (present agriculture becoming unsustainable as the climate continues to change) and large parts of the world suffer from hunger, Kitcher considers GMO research necessary. There are two major objections discussed: the risk of such new organisms and socioeconomic dominance.

Kitcher dismisses the first objection with the claim that “[t]here is nothing special, or especially risky, about *genetic* modification of organisms” [original emphasis] (240). Just like other new organisms, both newly introduced and newly created, their use should be “evaluate[d ...] according to *recognizably* high standards of agricultural experimentation and trial” [original emphasis] (240). Thus, transparent and proper scientific inquiry should resolve the issue.

For the other issue, Kitcher proposes to limit the economic dominance of agricultural corporations. GMO crops are patented and deliberately modified to be sterile, so farmers are dependent on resupply while the supplying agricultural corporations maximize profit. Kitcher proposes to restrict or disallow private ownership of such technologies, “urgently needed by the poor” (242). The specifics are left to the ideal deliberation that needs to balance the advancement of agriculture with public welfare.

While Kitcher is undoubtedly right about the public bias towards GMOs, this particular innovation is not necessary to solve the problem. Industrialized agriculture is already highly effective in producing food but much of it is used for producing luxury articles, especially beef, and it is not nearly as sustainable as traditional methods of farming like the field rotation systems or mixed farming (Agarwal & Narain 1996: 6–7). This problem can be viewed as entirely political, regarding the global distribution of food, or as a matter of social policy, as systemic hunger is often related to unchecked population growth.

Similarly, Kitcher seems to significantly underestimate the political effort needed to limit the highly problematic methods of profit maximization employed by the respective corporations. If a political institution were able to deal with these matters effectively, it is not conceivable why the primary causes of global power imbalance and poverty should not be addressed directly. The proposed technological solution merely mitigates the symptoms. Ironically, this case for GMOs appears to be an example of what Kitcher himself identifies as the “problem of parochial application” (STD: 123), i.e., a bias towards a particular solution to an accepted goal, even though ready solutions may be more fruitful.

Kitcher discusses the challenge of expert knowledge and climate change in §41 (243–248) and at various other points in SDS. Kitcher describes four “levels at which informed public exchanges are needed” (245), which are blocked by the actions of “climate deniers” (243) and the unsatisfactory organization of the public knowledge system. These levels provide an initial model of the pragmatics of this challenge.

On the first level, the truth of the fact of dangerous anthropogenic climate change needs to be acknowledged. This, Kitcher claims, would have already been accomplished in a system of well-ordered science, with the proper authority of science established. On the second level, predictions of the consequences of climate change are collected and assessed. Because there will be high levels of uncertainty and localized effects, the ultimate product should be a catalog of effects and estimates of probability.

After recognition and elaboration of the problem, “an ethical framework within which policies for apportion of sacrifices can be assessed” (247), needs to be developed on the third level. The human population ought to lead a deliberation about the allocation of costs and consequences. Kitcher identifies economic interests and ignorance of the suffering of others as the main obstacles to an egalitarian solution (247). Finally, on the fourth level, the world population will need to have an actual deliberation about risks, consequences, and the distribution of impacts and burdens for our descendants, based on the results of the previous levels (245–248).

The static nature of Kitcher’s account of the present problem is artificial and puzzling. The hierarchical levels appear inconsistent with the dialectic nature of any kind of deliberation and so does the strict separation of receiving knowledge and debating its consequences.

Finally, if level 1 requires only a transfer of available knowledge, it should not be called an ‘exchange.’ Level 2 is dependent on level 1 only if science needed an explicit consensual mandate to conduct research. That may be the ideal case, but it does not match reality. There is already plenty of research available on the effects and consequences of CC, even though there is no final public agreement on CC being true, anthropogenic, and dangerous. The actual division of epistemic labor, in which elites govern research, represents the interests of the public through these governing elites. The required catalog is already provided by the IPCC reports, even if there is a high chance of some perspectives being marginalized.

The description of the last two levels contains a contradiction. There can be either an ethical framework for apportion of sacrifices (level 3) or the deliberation on how to distribute the impacts (level 4) but not the latter depending on the former. The framework on level 3 would be an account of distributive justice, i.e., how to allocate the burdens created by CC and countermeasures. Such an account could be derived by experts, through principles or analysis of case studies, but goals and prescriptions would be independent of democratic judgment.

Kitcher explicitly forbids ethical experts and puts the authority on ethical issues exclusively in an egalitarian deliberation of the people, as discussed previously. When the participants deliberate on how to distribute the burdens, any preconceived ethical accounts can only provide tools to improve deliberation but are neither necessary nor a substitute. Hence,

the “ethical framework” on level 3 would ideally need to deliberate on the solution of the problem with due recourse to facts and ethical reflection, which is identical to the actual deliberation on level 4.

Kitcher’s explanation for the misapplication of this knowledge involves several aspects (243-248). First, there is genuine ignorance about the facts and their significance. There are issues with the communication of reliable information. One is the commercial nature of the media, as discussed above, and another is the active disinformation through climate deniers. Some people are unable to comprehend the significance of this knowledge for their own interests and, finally, others are genuinely concerned about value-judgments embedded in science.

To summarize, the issue of climate change provides a specific problem of knowledge transfer, where the scientific explanation for rapidly progressing global risks is accessible only by a minuscule subset of the population. A solution, as modeled here on ideal considerations, requires the initial acceptance of expert judgment and an egalitarian deliberation to govern policy decisions and further research. These next sections will discuss first the scientific consensus, its reception, and major perspectives invested, and then evaluate the utility of the modeling encountered in SDS.

3.2 The Core Fact

For the initial call to attention, society has to rely on experts. The following fact needs to be accepted by the public to have a meaningful deliberation, even though the greatest part of the population cannot comprehend its justification. Kitcher suggests that superior knowledge and the experts’ judgment of urgency should compel action and influence policy decisions. That this did not happen is attributed to the lack of a “reasonable division of epistemic labor” and an “erosion of scientific authority” (248). Science is not taken as seriously as would be expected.

Kitcher’s wording differs slightly in the three instances expressing “the statement at the heart of the consensus among climate scientists” (243), which will be referred to as the ‘core fact.’ As a consequence of the emission of greenhouse gases (GHG) by humanity, the mean temperature on the planet’s surface will rise by (at least) two degrees, even if countermeasures are taken immediately (34, 162, 243-244); if not, the rise will be significantly larger. The core fact can be analyzed into these components:

- (a) There is a continuous rise in mean global temperature.
- (b) This is caused predominantly by greenhouse gases from human activities.
- (c) If GHG emissions are drastically and immediately reduced, the increase in mean global surface temperature will amount to 2°C by 2100.

The propositions (a) and (b) are commonly referred to as “detection” and “attribution,” respectively. Together they describe the fundamental cause-and-effect relationship of CC. The conditional (c) is a scenario for the coming century, which is dependent on (a & b). It predicts a radical change in the environmental conditions and, thus, severe consequences for all humanity. This constitutes the significance of the core fact. The consequences implied, and the urgency expressed, justify reliance on expert judgment without initial recourse to the public domain. Additionally, Kitcher considers the core fact consensual in the expert community:

(d) The core fact is consensus in climate science.

It is difficult to assess the reliability of any of these statements without substantial knowledge and research. Neither the global development nor its causality and consequences are casually observable. Hansen et al. (2013) describe the most reliable method of measuring the earth’s energy imbalance as a system of 3000 floating probes, which have been collecting data on 90% of the oceans over decades. This data is then compared to historical records of temperature and controlled for the variation caused by solar circles. Without climatological knowledge, there would be no explanation of climate change, although various other professionals would undoubtedly be aware of various changes.

As discussed previously in 2.4, it is difficult for the public to assess which scientist is qualified to support or challenge the consensus, because the internal division of science is not obvious. For a systematic observer, databases of peer-reviewed articles provide a source of data by which the consensus can be quantified. Cook et al. (2013) find almost unanimous support for the reality of anthropogenic climate change. Cook et al. argue that even the large subgroup not stating a conviction in the abstract should be considered supportive of the consensus, as their authors moved on to more specific research topics (Cook et al. 2013: 5).

A similar study, conducted a decade earlier, shows no dissent in the body of over 900 abstracts (Oreskes 2004). There, about 75% percent of the sources affirm anthropogenic climate change explicitly or implicitly, while the remaining sources treat historical or methodological issues. Hence, there is a consensus about (a & b) within climate science.

The IPCC documents the evidence for (a & b). The climate has significantly changed over the last decades and the changes are unprecedented over decades or millennia¹³. GHG concentrations exceed the levels of “at least 800,000 years” and, combined with other human influences, they almost certainly have been the dominant cause of the observed warming since

¹³ Geologists are already debating the term ‘Anthropocene’ as a new geological epoch. This is contested but highly symbolic. It emphasizes that the current climate trends are significantly outside the relatively stable variability of the Holocene, during which human civilization developed. (Diane Ürge-Vorsatz. *A brief history of humankind*. Presentation at “Women for Future”, University of Vienna, 2 July 2015)

the mid-20th century (2015: 2–5). Furthermore, by combining the various lines of evidence, it is concluded that “it is *virtually certain* that human influence has warmed the global climate system.” [original emphasis] (Stocker et al. 2013: 73), signifying a 99 percent certainty¹⁴. In the previous assessment report, it was already reported to be “very likely” (> 90%) that global warming is not a natural phenomenon and that GHGs have been the dominant cause (Hegerl et al. 2007: 1-2). Moreover, not a single climatological model was able to generate the actual rise of temperature without taking human agency into account.

The danger posed by CC cannot be evaluated as clearly as the fact of CC. All predictions carry uncertainty and there are inevitable value-judgments required to specify what interferences are considered harmful and at what magnitude. The IPCC deliberately avoids the judgment of ‘danger’ to remain disinterested and instead presents risk assessments and projections to be judged by whomever it may concern (Field et al. 2014: 61; Stocker et al. 2013: 118).

The basic principles are clear, however. The future development of CC depends most of all on the cumulative CO₂ emissions, the single largest contributor. CO₂ causes 70 percent of the GHG effect, much of it will remain the atmosphere for centuries, and it is traceable to fossil fuels (IPCC 2015: 8–10). Carbon dioxide needs to be removed from the atmosphere, in addition to halting emissions, or the global mean surface temperature will rise more than 2°C, relative to pre-industrial times (IPCC 2015: 20–21). Consequently, the IPCC concludes that additional mitigation to reduce the drivers of CC is necessary to avoid “severe, widespread and irreversible impacts” on the global scale (IPCC 2015:17). This implies that substantial changes in energy production, consumer patterns, and investment are necessary (IPCC 2015: 28-30). If these measures are implemented, a distinct possibility remains that CC can be reduced to a level of moderate risk by 2100 (IPCC 2015: 20–25). This conclusion is of utmost importance, as a quick transition to a sustainable economy reduces the risk of serious consequences in the future.

Thus, (c) is not strictly true, even if the implications are. There are scenarios that are likely to restrict the increase to less than 2°C global mean temperature under optimistic conditions (IPCC 2015: 8). However, even under favorable conditions, serious consequences may occur and, currently, the trend points towards a far less favorable development. Obviously, Kitcher is concerned about the overall and particular challenges that CC poses and not the specific numbers. Hence, it might be more useful to substitute (c) with:

¹⁴ The IPCC uses a standardized vocabulary to express their expert confidence in or probability of findings (Mastrandrea et al. 2010). Only findings with a good quality of evidence and reasonable agreement throughout the scientific community are presented as numerical probabilities or a corresponding level of likelihood.

- (e) If GHG emissions are drastically and immediately reduced, the risk posed by CC will be significantly lower.

This fact has been incorporated in global climate agreements. Hansen et al. (2013: 1–2) report that the global declaration to reduce fossil fuel emissions was introduced in 1992, through the UN Framework Conference on Climate Change (UNFCCC), while the target reduction of global warming to no more than 2°C was proposed in the EU in 1996. Article 2 of the UNFCCC declaration states the ultimate objective to be the

“stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner” (1992: 3).

From this central objective, it is evident that the fundamental problem, the concentration of GHGs, is recognized in transnational structures. The reluctance of the IPCC to provide an assessment of danger is owed to the wording here, as recognition of danger would necessitate certain measures.

The survival of ecosystems, sufficient food production, and sustainable economic development are the objectives of a solution and already under threat. Vulnerable ecosystems like the Arctic, coral reefs, and the biodiversity of coastal regions are already affected and under very high risk (IPCC 2015: 70–73). Food production is threatened as well – even though some regions may benefit from the changing climate – and there has likely been a reduction in crop production already (IPCC 2015: 50–51, 69). Consequently, the recent *Paris Agreement* acknowledges that a temperature increase of 1.5°C would “significantly reduce the risks and impact of climate change” (UNFCCC 2015: 2).

To summarize, climate change is an accepted fact amongst climate scientists and is adequately reflected in global climate targets. The recipients of that knowledge in global climate committees are elites of some kind and not the whole population, as necessitated by a division of democratic labor. So far, the division of epistemic labor seems to be intact, albeit slower than desirable. The shift from ‘prevention’ to ‘risk reduction’ indicates a changed awareness. Apart from mitigating the central greenhouse effect, alternative lines of action can provide substantial benefits to the people under risk. This shift from simple causalities to systemic modeling allows for a broader view of existential dangers.

3.3 Belief Formation

As consensus is solid and reflected in the agreements of some elites, the problem appears to lie with the adequate understanding by the wider public and their influence on day-to-day politics. In various ways, elected representatives are required to act in the interest of their electorate even if that is ill-advised.¹⁵

Kitcher reports a fading public concern about climate change even in environmentally-conscious countries. He refers to an uncited “Yale survey of attitudes to climate change,” which reports that 63% of the US population believes that climate change is occurring, yet only 50% seem to believe in anthropogenic causes, “if it is occurring” (243). The latest “Yale survey” shows that Kitcher’s alarm over the significance of these survey questions is still warranted, as agreement levels remain similar at 70% for global warming, and 54% in anthropogenic causes “[a]ssuming global warming is happening” (Leiserowitz et al. 2012: 18).¹⁶ This data is largely in line with another recent poll, which reports an eighth of the population not convinced and another eighth in open denial (PEW 2013). The analysis also shows that, while roughly half the US population thinks there is a scientific consensus, the belief in such a consensus correlates overwhelmingly with the perception of anthropogenic CC.

In the EU, CC is perceived as only the third most pressing global problem, after “poverty, hunger, and lack of drinking water” and the economic situation (35, 24, and 16 percent respectively) (TNS Opinion & Social 2014: 7). While concern about CC is generally intense, worry is best predicted by the economic status of an individual (TNS Opinion & Social 2014: 19, 24, 61). Scruggs & Benegal (2012) show that all indicators of public concern over climate change (subjective worry over consequences, accepting the fact, and trust in the attribution to human influence) dropped sharply (between 10% and 20%) between 2008 and 2009, both in the US and the EU. An equally sudden decline of support and accompanying rise of skepticism during the great recession is evident in all reviewed surveys that cover this period (Leiserowitz et al. 2012, Scruggs & Benegal 2012, PEW 2011, Krosnick & MacInnis 2012). The studies reviewed here indicate roughly an eighth of the US population to change their beliefs under economic distress, to clear the cognitive dissonance:

“What is [...] puzzling is not that people’s *priorities* shift with the economic conditions, but that their *beliefs* about basic climate facts and their trust in climate science also appear to change. The condition of the economy should not alter perception of basic facts or the state of scientific opinion. And yet public opinion trends suggest that people are more

¹⁵ See the discussion on p25.

¹⁶ The institutional affiliation and perfectly matching data suggest this was Kitcher’s source, even though it was published slightly later than SDS.

likely to ‘deny’ various facts today than they were a few years ago.” [original emphasis] (Scruggs & Benegal 2012: 508)

Of course, surveys report professed beliefs, which may be strategically altered but this only means the significance of beliefs has to be considered as well. CC beliefs are not directly determined by scientific evidence, because disbelief and distrust can rise while evidence only increases.

The outrage over the ‘Climategate’ scandal follows a similar pattern.¹⁷ Climategate “mainly affected the views of those who were ideologically predisposed to be skeptical of global warming to begin with” (Leiserowitz et al. 2013: 827). The authors explain this effect as motivated reasoning, which means that for those predisposed to distrust experts, little evidence is needed to corrupt any trust built up. Kitcher appears justified to understand trust as central to an effective transfer of knowledge.

Psychological studies corroborate this difficulty to arrive at reasoned convictions. Swim et al. report the well-established psychological fact that “[a]lthough people are, for the most part, able to articulate their opinions, beliefs, and preferences accurately, they are notoriously poor at recognizing the causes of their behavior” (2011: 245). Some of the particular barriers against behavioral change are “hyperbolic discounting, which gives current outcomes more weight than temporally distant outcomes even when the latter are of greater value [and] reactance against policies perceived to reduce individual control; and perceived social norms that encourage energy use” (2011: 244). Energy-related decisions and behavior, for example, is more accurately explained as a result of alignment with previous norms than through a cognitive model, including affective components, or rational decision theory (Brosch, Patel & Sander 2014).

Furthermore, belief in climate change is often related to unreliable personal experience, such as local variations in temperature (Li, Johnson & Zaval 2011; Joireman, Barnes-Truelove & Duell 2010). This confusion of climate and weather is of grave concern with regard to communicating future risks. Common sense compares predictions of a few degrees rise in mean global temperature to a few degrees more ambient temperature, although they describe vastly different phenomena (Hansen et al. 2013: 3). Expressing the present changes as a rise of 2°C over a century is, therefore, dangerously ambiguous for the larger population.

¹⁷ Leiserowitz et al. (2013:219) describe this ‘scandal’ as theft of academic email correspondence in 2009, which then was used to discredit CC researchers as biased. The researchers involved discussed how to present data successfully and counter skeptical arguments, while cursing mildly on outspoken opponents. They were attacked and threatened by denialists but absolved of misdemeanor by scientific authorities.

Belief in expert consensus and measures of mitigation appears to be mostly based on personal predisposition and convenience of these measures. Therefore the highly promising measure of eliminating the use of fossil fuels over the next decades receives very low support; lower even than solar radiation management techniques (Bostrom et al. 2012; PEW 2013), which are extremely speculative (IPCC 2015: 89) but do not require individual sacrifice. Krosnick and MacInnis (2012) show mitigation options with the highest impact on CC and the individual lifestyle (e.g., taxes on gasoline or electricity) received the lowest support. People prefer policies that are “neither risky nor painful” (Bostrom et al. 2012: 220), such as planting trees or higher industrial standards of fuel efficiency, regardless of their effect on the climate. Although 9 in 10 Europeans report taking some kind of action against CC, mostly recycling and waste reduction, these are of little impact but provide tangible gratification. The majority considers the responsibility to lie with national governments, followed by businesses and the EU, and only about a third of the respondents see themselves responsible (TNS Opinion & Social 2014: 37-38, 24).

There is a different kind of ignorance at work than those discussed above. If a large proportion of the public in western democracies are receptive to economic triggers for changing beliefs, ignorance of the core fact is not merely a matter of failed knowledge transfer. The denial is purposeful, although not necessarily conscious. Denial of the core fact means avoiding the distribution of burdens and thus allows for more freedom to deal with immediate issues. In contrast to Kitcher’s claim, for many, an increase of knowledge would, therefore, correspond with a decrease in freedom.

That the burdens will be significantly larger in total, if the remedy is postponed, is a “prosaic public goods dilemma” (Scruggs & Benegal 2012: 512). Conversely, the surveys show consistently – although in varying terms – that people with an egalitarian worldview and members of disadvantaged groups (e.g., ethnic minorities, low-income, women) show less denial than those closer to the privileged center (Leiserowitz et al. 2013; PEW 2011; Scruggs & Benegal 2012). As noted previously, the IPCC places disadvantaged people at a significantly higher risk and, consequently, it is strategically rational for marginalized people to embrace climate action.

The process of denial just described has its equivalent on the policy stage. The linear model of expertise rests on three assumptions: more research leads to more certainty, more science can resolve political disagreements, and because science is separated from politics, political decisions that are evidence-based are considered more rational (Beck 2011: 298). This, however, requires adequate consideration of the evidence by decision-makers.

The IPCC provides a highly detailed account of their data and judgments. Unlike most private citizens, policymakers have the resources to evaluate the science and are therefore unable

to claim ignorance. However, a survey amongst a global elite reports significant concern that national governments, as well as firms, are myopic with regards to long-term and low-probability risks (WEF 2014: 26–27). Firms do not recognize system stability and economic sustainability as their responsibilities, while governments are limited by electoral cycles and the fragmentation of risk assessment across various institutional bodies. Hence, there are unfavorable limitations on actors that could assess the evidence.

Furthermore, if it is necessary to accept the core fact before devising policy, denying, accepting, and doubting it provides distinct strategic options. Boykoff & Boykoff (2004: 125,133–134) report that the conservative US government stalled climate action in the 1990s by calling for more research to reduce uncertainty, while industry-sponsored scientists emphasized scientific uncertainty in public media to reduce credibility.

Meanwhile, scientists are to blame for maintaining that uncertainty for a high-stakes issue like climate science can be reduced with additional research, even though there uncertainty, in the sense of the gap between the scientific understanding and the nature of the phenomenon, is caused largely by the various value-frameworks and disciplinary approaches (Sarewitz 2004: 393–396). In high-stakes issues, science is politicized because normative issues are discussed in terms of evidence and certainty, causing “proxy debates” (Beck 2011: 302). In these proxy-debates, political value-conflicts are translated into diverging levels of evidence or preferences in discipline, which creates the strategic options mentioned above. This is a problem for the ideal proposed here, as the availability of shared knowledge is considered a necessity for an informed debate. It seems that uncertainty here more accurately represents the diverging significance, in Kitcher’s sense, the knowledge has, than the relation between knowledge and phenomenon.

To summarize, knowledge generated by climate science is, in fact, widely received but the response is misguided. Public support for CC policies is largely vulgar because certified knowledge is denied or accepted according to its utility in reaching various goals. Moreover, there is no evidence that people, in general, consider the interest of others in devising their preferences. Even if knowledge is adequately considered, it can be consciously discredited to support particular interests or undermine opposing views. Climate science could only determine policy if there was no conflict of interests but since there is, the complex physics at the center of this knowledge provides a distraction from negotiating the conflicting interests. The motivated reasoning encountered in the reception of climate science requires that people must not be modeled by exclusively rational decision theories. Rather, people seem to build belief based on a mixture of beliefs, values, and emotions. This is highly relevant for considering the possibilities of citizen juries to improve the effectiveness of climate science.

3.4 Significance

Trust in science is, at least partially, a matter of motivated reasoning. It depends largely on a perception of shared interests or, more generally, a commonality of values. For climate science to be globally trusted, it would need to be perceived as meeting everyone's values. This is what Kitcher desires from ideal transparency, but as demonstrated in section 2.4, this ideal is inconsistent with collective, democratic decision making.

Unlike Kitcher's fully rational ideal, particular communities have distinct procedures to accommodate knowledge in their collective decision making. Jasanoff calls these procedures "civic epistemologies" (2010: 240). Climate science operates at a level of abstraction and a temporal and spatial frame that is alien to customary reasoning (Jasanoff 2010: 241–242) and therefore, already problematic to integrate into public discourse.

However, inaccessibility is not the only problem. Other highly esoteric fields of science, say particle physics, do not cause that much destabilization. Jasanoff observes that procedures of certification, especially transparency of construction and justification, are not enough for the integration of knowledge, because "the fit of social practices matters as much, inducing a sense of ownership and responsibility toward the smooth operation of the system in question" (2010: 243). Sociologically, the successful integration of science requires the value-frameworks underlying the goals and parameters of research to match those dominant in the particular community. This 'fitting' of science is what Kitcher would have an ideal deliberative society do explicitly and collectively to avoid the unidentified oppression of risks callously ignored or alternatives disregarded.

Commercial mass technology offers immediate justification through the experienced utility of technical applications. Collins and Evans (2006: 70–74) describe commercial development to create – in Jasanoff's term – an immediate fit between science and society. The design process considers consumers' desires or even presents opportunities for cooperation. The resulting artifact validates the science and hides all non-designated decisions in its material manifestation. This technology of knowledge creation, validation through visible manipulation, was already fundamental to early modern science (Brown 2009: 56–58). Technical appliances are typically experienced to increase freedom, i.e., provide additional options, and can be literally owned. Already a century ago, Max Weber (1995: 18–19) observed that average people believe the promise that comprehension of the tools provided, e.g., a tramway, is possible but that they rarely possess such comprehension.

Hence, in our present civic epistemology, trust and belief in science, are a function of the perceived reliability of the tools and the overlap with the dominant value-framework. However, climate science is currently disruptive in a way that other branches of science are not. Brown provides an insightful definition under which condition science and other social institutions become political: “Ideas, practices, or institutions become political when both power and conflict appear where previously either or both were either lacking or suppressed, accompanied by a shared interest in reaching a binding resolution to the conflict” (2009: 188–191). Thus, it would stand to reason that the destabilization caused by climate science originates in presenting a substantial conflict that was previously not apparent.

To understand the balancing a citizen jury could achieve, it is required to specify the value-conflicts surfacing around climate change. Of particular interest are where comparable power levels appear that allow climate science to become politically exposed and how these various perspectives are reflected in climate science.

The central perspective in western countries is probably the issue of heritage, i.e., interest in the well-being of our descendants, which matches the ethical concept of “intergenerational injustice” (Hansen et al. 2013: 19): the next generations will inherit a highly problematic situation, which they did not cause and will be largely unable to control. If widespread life projects are threatened, such as the happy grandchildren that Kitcher (183, 243) and Hansen et al. (2013: 7) invoke, the evidence should be evaluated and integrated into public policy. This coincides with a desire to preserve the habitat of humanity. It conflicts, however, with the values and priorities of the presently dominant economic system, which promotes a steady growth of consumption and convenience – call this the commercialist perspective. As long as the costs for growth were outsourced, social tension was low. Now, the knowledge generated by climate science shows a conflict between fundamental values within the affluent nations, which was formerly not apparent. This is likely the cause of the politicization of climate science because there is sufficient political power behind these diverging perspectives.

A contrasting perspective is discussed by Agarwal and Narain (1996), who analyze global environmental politics from a postcolonial point of view. While their argument is a contribution to policy debates in the early 1990s, the observations about value positions embedded in climate science remain relevant. The authors show how the responsibility of industrialized nations is hidden through climate modeling in an influential report, which understates the role of fossil fuels and exaggerates that of tropical deforestation and animal husbandry¹⁸. Simple rules of

¹⁸ The report is cited as “World Resources Institute 1990, World Resources 1990-91: A Guide to the Global [sic] Environment, Oxford [sic] University Press, New York.” (Agarwal & Narain 1996: 20).

reduction per country ignore what different activities these emissions represent in developed and developing countries, as well as the historical responsibility of the industrialized countries (cf. Hansen et al. 2013: 17). Statistics and calculations relative to nations and normalized at recent values are strongly biased in favor of the developed countries. In addition to deliberate misinformation, this bias can be attributed to both a lack of original research in developing countries and the dominance of Western media (Agarwal & Narain 1996: 14–19). Without original research, the authors fear that mitigating measures negotiated by the developed could again outsource the costs to the developing countries.

In addition to the political aspect, more regionally diversified research is a technical necessity. localized knowledge is crucial for successful adaptation and mitigation because most possible measures are inherently local (IPCC 2015: 96, Table 4.2.). While the IPCC may provide the assessment that, e.g., diversification of crops is advisable so that the risk imposed by a future increase of extreme weather events is reduced, the question if and how can only be answered in a local context.

Another distinct perspective are inescapable threats. The current rise of average sea levels, for example, is an existential threat to many Pacific islands and other low-lying coastal regions. At only one meter of sea-level rise, relative to a recent average, many locations will have exceeded their limit for adaptation (IPCC 2015: 65–66). For such regions, e.g. the Federated States of Micronesia, the declaration to improve “capacity-building” (UNFCCC 2015: 9) through global policy is cynical, if the community’s capacity to adapt is severely restricted by topographic limitations. For these communities, a long-term risk-reduction strategy is of little use because of the high-probability high-risk scenario of their land being submerged. Unable to commit, the IPCC suggests that there may be “ethical implications for mitigation decisions” (Field et al. 2014: 86–87) due to limitations to adaptation. In line with the egalitarian notion in Kitcher’s ethics, these fundamental needs ought to precede any negotiation. Completely cutting global GHG emissions might benefit this perspective the most because it would halt global warming at the lowest possible level. This, however, strongly disrupts commercialism and might severely impact the development of marginalized regions that still depend on the mobility of fossil fuels.

A final perspective is that of gender inequality. The IPCC is conscious of the intersectional nature of inequality based on various social processes (Field et al. 2014: 50). Due to limited adaptive capacities, all people affected by inequalities are more vulnerable and less likely to benefit from responses to climate change. Gender inequality, in particular, is likely to be reinforced by both the consequences of climate change and policies inconsiderate of these inequalities (Vincent et al. 2014). Vincent et al. suggest that “[r]ights-based approaches to

development can inform adaptation efforts as they focus on addressing the ways in which institutional practices shape access to resources and control over decision-making processes” (2014: 108). This appeal to rights must also be understood as an attempt to institutionalize a necessary level of equality that, presently, does not occur naturally in the debate of policy options.

As noted above, marginalized people are likely to bear the costs of any issues related to climate change unless their interests are explicitly considered. A fundamental problem appears to be the prominence of economic modeling in all discussions of climate action. The IPCC claims that “[e]conomic methods can reflect ethical principles, and take account of non-marketed goods, equity, behavioral biases, ancillary benefits and costs and the differing values of money to different people” (2015: 77). However this is calculated, the ethical issues are objectified, and the participatory element eliminated. For example, the report predicts massive economic impacts to occur because of reduced human productivity through disease, malnutrition, or displacement; the loss of agricultural productivity; possible large-scale infrastructure breakdowns; an increase of poverty and the related risk of violent conflict; and so on (IPCC 2015: 69–73). Those exposed to these risks would presumably judge even low levels of probability unacceptable. Therefore, these issues would also take priority in collective measures, while modeling them in economic terms conceals their significance.

In addition, economic predictions are much less reliable in the long term than climate predictions because of the high sensitivity to changing circumstances and the assumptions this reflexivity necessitates (IPCC 2015: 79; Jasanoff 2010: 242). The IPCC reports the accumulated costs per ton of CO₂ equivalent emissions, i.e., a standardized measure for any GHG emission, to be calculated between a few dollars and a few hundred. Thus, a discussion of monetary costs is more speculative and diverting attention from the negotiation of interests.

On a local scale, this relation is turned around. Local policies are easier to implement than global ones because local requirements can be met and thus opposition reduced. However, they are less cost-efficient and climate-effective in total (IPCC 2014: 28). As discussed in the previous section, measures are met with opposition if there are burdens involved. A steadily rising carbon tax is a specific and effective measure of mitigation (Hansen et al. 2013: 17) and would be in line with sustainable economic development because it is a long-term plannable process. However, an increased price on fuel is widely met with resistance as there is a high value placed in individual mobility, and hence, a restriction would be highly inconvenient.

Local policies allow for a negotiation which increases acceptance. In particular, ‘co-benefits’ can be identified and allocated, i.e., additional advantages of environmental policies.

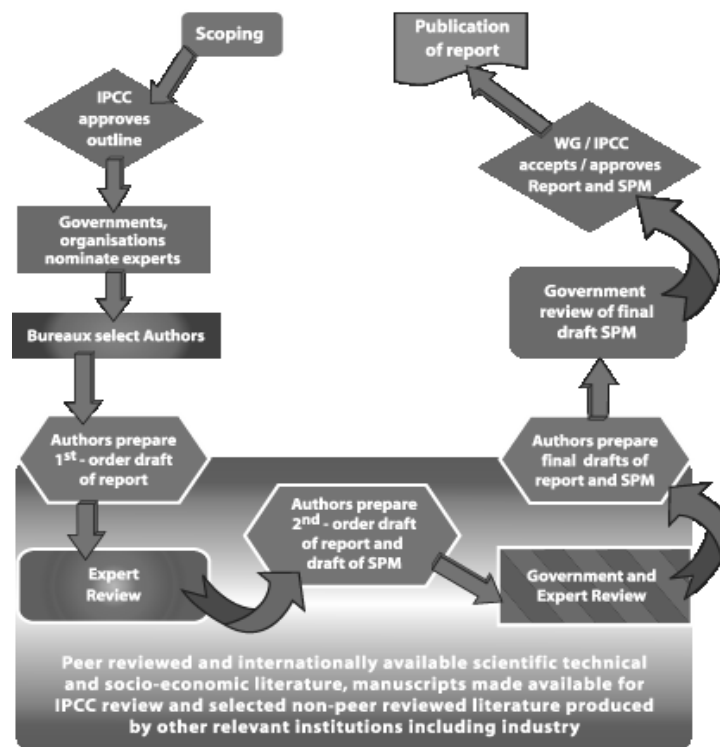


Figure 1 The process of composing an IPCC report

However, the short-term nature of economic concerns and political accountability undermines the pursuit of the most promising and cost-effective option.

Finally, the institutional structure of the IPCC also provides some insight into the overt representation of value positions. CC-related research has increased massively over the last decades and the population of researchers has diversified. However, authors from developing countries are still underrepresented (Field et al. 2014: 38) as are female authors, with 36 and 21 percent respectively¹⁹. This presents the risk that inequalities are entrenched in the reports used to negotiate policy.

The value-free ideal causes the IPCC to remain disinterested. When touching the aspects related to policy-making, the IPCC aims to “[...] support a rational public debate about value conflicts [by making] implicit value judgments and ethical viewpoints as transparent as possible” (Edenhofer, Pichs-Madruga & Sokona 2014: ix). However, references to ethical issues are sparse in the summaries of the IPCC reports analyzed for this thesis.

Explicitly considered to pose ethical questions are limitations on adaptive capacity, the manner of transformation, the judgment of danger, selection of policies, balancing economic evaluations, equitable sharing of efforts, balancing mitigation efforts and development in developing countries, the necessary amount of mitigation, intergenerational sharing, historical

¹⁹ https://archive.ipcc.ch/img/Statistics_ar5.png (1.3.2019)

responsibility, and the development of new technologies to counteract CC (Field et al. 2014: 85-87, 89, 114; IPCC 2014: 5; Edenhofer et al. 2014: 37–39, 61).

For these value-conflicts, the IPCC suggests involving ethical experts, as defined by Kitcher. Social and normative sciences, including economics and ethics, are supposed to support decision-making by capturing the actual values involved, their mutability, making them comparable, and how to mediate between them (Edenhofer et al. 2014: 37). This points to a technocratic understanding in which representatives merely need to make the right choices with the support of the sciences. As discussed for economics above, ethical aspects can easily be objectified in such accounts, while the ideal suggests that such elements be decided in an egalitarian discourse. Furthermore, the recipients of such supporting assessments are political representatives, which are assumed to act under partisan influence.

Regardless of their actual values, these representatives are involved heavily in drafting the assessment reports, as Figure 1 shows. This iterative review by government officials and experts who are not authors of the reports allows for scrutiny through feedback loops, without widening the body of participants too far (IPCC 2013: 4–10). It is the function of political representatives to identify the implicit value positions embedded and presumably exert some influence over them. Therefore, a clearly identifiable interface for value positions exists in the process of crafting these reports.

Consequently, if certain value positions are not adequately represented, diversity has to be increased amongst researchers and representatives. This is particularly obvious when a particular perspective cannot be tied to a national agenda. The Federated States of Micronesia can convincingly convey a perspective of imminent threats, for example, but a feminist perspective is secondary in every nation. For such perspectives, activists are needed in the review process or the explicit and implicit values are going to represent the dominant mainstream.

3.5 Well-ordered Climate Science

As specified by my working thesis, the measure of success for a pragmatic theory of science in society is an improved utility of the knowledge created. From the topics considered in SDS, climate change is the most significant problem and can be understood as a problem of knowledge transfer for a limited set of facts. Consequently, the measure of success for SDS is an arguably improved consideration of the knowledge generated by climate science in public discourse, because a free and rational discussion of policy options amongst the whole population is envisioned as ideal. The particulars of the problem of climate change can be applied to the ideal of a well-ordered science. First, the ideal itself and then the proposal of citizen juries will be evaluated.

From Kitcher's description of the problem, as discussed in detail in section 3.1., it follows that there are two steps required for improvement. On the one hand, the best knowledge available needs to be applied, and this means that the core fact has to be accepted. On the other hand, the interests of all people are to be considered in further research.

What an ideal deliberation about climate change would look like is difficult to imagine. Put concisely, in an ideal conversation, all relevant human perspectives would be represented and deliberate to develop a considerate solution. The individual interests are evaluated against the best available knowledge – including diverging results and estimates on future possibilities – to arrive at refined interests. These refined interests are then exchanged amongst all participants to arrive at the most widely accommodating option. The knowledge needed for refinement of interest ought to be drawn from the SPK. The authority of science and the knowledge contributed to the SPK are acknowledged because the interests encoded in the stages of knowledge generation are those dictated by an ideal conversation.

Initially, however, an unsanctioned judgment of urgency about CC is unavoidable because various aspects of a novel situation could not have been preapproved. The first level, therefore, needs to direct and constrain research agendas that should enable the participants to refine their interests on this topic. The problem is not the core fact itself, but that a relevant scientific body of experts judges the facts they discovered to pose a significant problem. Without understanding, it is impossible to pass judgment, but without judging particular facts to be a problem there is no conversation, ideal or otherwise. Kitcher is right to reject strict adherence to the ideal of value-free science (34). The core fact itself would be irrelevant, if not for the particular dangers posed to humans, so the first topic has to be the criteria for a body of knowledge that enables the participants to arrive at refined interests. In Kitcher's terminology, the social significance of the problem has to be decided on, because it is a novel situation.²⁰

Put into practice, a set of human perspectives on this topic needs to be created to appoint representatives.²¹ Yet without an understanding of the significance, there are no criteria to classify distinct perspectives. Hence, the only people qualified to select the affected perspectives are the warning scientists. Otherwise, the representatives of any kind of deliberation will represent historically grown bodies, such as the nation-states and activist groups that presently shape the public debate.

²⁰ See p29 for the significance of problems.

²¹ See p24 for a more detailed critique on reducing autonomous subjects. For the sake of argument, it is assumed that a satisfying solution can be found.

However selected, the deliberators are required to evaluate methods, evidence, and judgments thoroughly, instead of merely receiving it passively, to avoid the various biases encountered in the present debate.²² Shortcomings in methodology, illicit values, or perspectives not considered can thereby be addressed so that all participants can educate their interests with knowledge according to their own value positions. The participants would have to offer their requirements for certifying the warning. This would have been the ideal response to the warnings, at least after the first IPCC report in 1990.

It appears that the topic of the first ideal deliberation has to be the allocation of resources available in science and other sources of knowledge to gather evidence on climate change that accords with these requirements. Devising these requirements by each participant corresponds with participants developing their ‘raw preferences’ into ‘tutored preferences,’ after receiving the initial briefing. In the next step, the deliberators need to form ‘refined interests,’ according to the relative danger of the various perspectives, and finally, the deliberation arrives at an agreement on what knowledge should be collectively created.²³ To conclude, the first level challenge already requires a deliberation for the public to accept the core fact.

At least for a novel problem, it seems that the ideals proposed for a shared notion of public reason are unnecessary since they need to be negotiated in context.²⁴ Once the initial information supplemented and evaluated, a body of shared public knowledge specific to the problem has been created based on a plurality of notions of reason.

The second level deliberation requires a collective position on how to react to the threat. In this case, the prototypical ideal deliberation can be applied because the significance is now known and reliable knowledge available. However, the fundamental problem here remains, as concluded in section 2.3, that there is no compassionate global community. The high risk of rising sea level and rapid increase in natural disasters, for example, should be enough to justify an immediate stop for the largest CO₂ sources. In a compassionate and informed deliberation, no amount of inconvenience could reasonably deter intervention.

Secondly, as these are Kitcher’s principal proposals for improvement, it needs to be discussed whether there is evidence for climate juries to improve on the application of knowledge about climate change. The civic epistemologies²⁵ present in western industrialized countries appear to be incapable of processing this kind of indemonstrable knowledge with the necessary urgency. Hence, the first challenge is that

²² See p50.

²³ See p22 for the progression of preferences in the ideal deliberation.

²⁴ See p36 for details on these ideals.

²⁵ See p58. The procedures through which a community incorporates knowledge.

- (a) A solution accelerates the core fact becoming publicly accepted.

It is not important in what manner that knowledge is incorporated, as long as it is used as a foundation to reason about further decisions. The universal informed consent that Kitcher envisions would be an enlightened solution but is, of course, quite utopian. It seems more likely that the core fact becomes convention, i.e., generally accepted as fact even if most people could not explain why. This seems the probable result if trust in science is reinforced. However, even a dogmatic prescription would be an improvement if the fact is accepted.

As discussed above, mere acceptance of the fact is not enough, because facts alone do not carry significance. In contrast to the ideal, however, neither egalitarianism, compassion, or truthfulness can necessarily be expected in global politics. Even the search for facts can be selfishly used to argue against effective climate policies.²⁶

Hence, the more necessary improvement is an increasingly egalitarian governance of further research and debates about policy. As concluded in sections 2.2 and 2.3, Kitcher's ethics require progress towards a more egalitarian global community. A mode of negotiation needs to be found that is more compassionate, collaborative, and truthful than presently. Regarding CC, this requires first and foremost that

- (b) A climate jury improves the consideration of marginalized perspectives in climate policy and the guidance of additional research.

If climate juries can reasonably be expected to improve on these two challenges, that would be substantial progress towards ideal decision-making.

Briefly put, Kitcher proposes to employ citizen juries to remedy various deficiencies in the present interaction of the epistemic and value domains. The primary purpose of citizen juries is to comprehend a particular field of science and act as a mediator with the public.²⁷

To meet target (a), the jury needs to either understand the facts and the urgency of the matter first and then convince the public or, alternatively, enable a scientific authority to do so. For these tasks, it is sufficient to design these councils as advisory boards without decision-making power. It should be possible to teach a compact group the basic methods and reasoning behind climate science, even though the diverse educational backgrounds might require various didactic approaches and support for the scientists in charge.

Scientists can inform the jury of the urgency as well, but an argument about urgency is part of the value domain and other rules apply. The scientists could easily speak for their own interest in intergenerational justice or continuing commercialism, both of which can certainly

²⁶ See p57.

²⁷ See section 2.5 for a detailed elaboration of these juries in Kitcher's philosophy.

be found. This would require for scientists to drop the mantle of objectivity and expose the values that motivate them.

For the discussion of perspectives not represented amongst the scientific body, it would be preferable to have representatives of the affected parties in the jury. These can provide a firsthand account of their interests, which they should be able to relate to CC after having been tutored. Here again, it is a fundamental problem that the affected perspectives cannot be selected until the significance is known and, hence, the only people qualified to do so initially are the warning scientists themselves.

Of the perspectives discussed above, the availability of representatives depends on the context. A feminist perspective can be found in all western countries, but representatives of distant locations can hardly be members of such a, presumably national, council. Such interests might be represented through outsiders, but that remains an insufficient integration of these perspectives.²⁸

A similar effect can be expected regarding the distribution of knowledge. The people furthest from academic research are not likely to be reached by intellectual journals or popularizers of science. As discussed in section 2.4, the transparency of judgments in research erodes quickly beyond the core research group. For most people, there is no viable way to gain access to the production of scientific knowledge. Those of irremediable ignorance, as Kitcher calls this position, could suddenly find a reliable source nearby on which they could draw. The stage of transmission in Kitcher's SPK ignores that, for large parts of the population, a reliable source can be a priest, a mayor, or an internet celebrity. A few people distributed throughout society who are involved with the field of research can, figuratively speaking, shorten the distance between the average individual and scientific knowledge production.

The acceptance of climate science ought to be improved by such a measure, as distrust of climate science correlates with distrust in scientists. If more outsiders are able to comprehend the epistemic work done, some could be remedied by their fear of ideological dominance and might develop a deeper trust in various institutions.

To meet target (b), a jury might require decision-making power. As discussed at length in section 2.5, if a jury ought to make binding decisions, it requires legitimacy and becomes a target for political manipulation. A similar kind of political haggling over short-sighted interests, like in present climate politics, can be expected. Even if the engagement in these juries were to remain shielded from immediate public scrutiny, to improve collaboration, public accountability, and thus exposure, is required from a democratic institution.

²⁸ See p24.

Furthermore, the scope of power also limits the inclusion of marginalized perspectives. It cannot be expected that marginalized communities from distant regions would be represented in national committees of those countries where most research is conducted, or the funds are allocated.

As an alternative to standing councils, I proposed to take the notion of juries literally. Citizens juries could judge the consistency between facts and the goals proposed for policies. The governing bodies would still remain as little or much ignorant as they are, but they would be forced to be sincere in their goals, and this improves deliberation. The juries would need to direct their own tutoring, regardless of established disciplinary boundaries. Self-directed study and engagement in controversies are likely to improve the knowledge of those citizens even more than mere participation. The persistence of climate change makes it necessary to appoint juries repeatedly, as new issues arise because permanent councils are more exposed to political pressures than temporary councils are. In addition, standing councils would be much more difficult to legitimize democratically.

In conclusion, there are good reasons to consider citizen juries an improvement for the social embedding of science. Target (a) can be met without any changes to the democratic system. For target (b), more effort will need to be spent on devising an institutional design. The parochial politics that Kitcher spurns are likely to persist in any institutional scheme that requires virtuous conduct, instead of structurally inducing the candid and compassionate deliberation that Kitcher's ethics aim at.

4 Conclusion

The description of science as a democratic institution found in SDS is deeply embedded in questionable assumptions about the way science and society work. The repeated mismatch between unlimited ideal processes and context-dependent real processes weakens the overall argument. Most irritating is the absence of a comprehensive ideal for science. Kitcher discusses science almost exclusively as a real institution consisting of realistic individual actors, who, for example, exhibit strategic reasoning. Considering that public decision making is a superordinate process, it would stand to reason that designing science to fit the ideal is a simpler task than redesigning public decision-making and leaving science untouched.

Furthermore, this distinction between ideal and real entities seems to undermine the pragmatic philosophy. If science is understood as a problem-solving endeavor, its knowledge is value-laden and dependent on the specification of the problem. Therefore, an educated recipient of such knowledge should be aware that, based on an alternative value-framework, the facts of any given situation can be constructed in quite a different way.

In line with the ethical foundations expressed in SDS, increased deliberation of the value-domain of epistemic labor is likely to achieve more considerate scientific labor. Citizen juries are a specific promising intervention to free scientists from some responsibility for the value-domain of epistemic labor. In addition, a closer involvement of the citizenry would strengthen the legitimacy of science. The various participatory democratic approaches recommended in this book are plausible improvements of the current workings of knowledge creation and application, because the ethical ideals necessitate a more egalitarian governance.

Finally, the application of scientific knowledge remains a problem of action. Science can always generate more facts and more detailed descriptions, but science has to refrain from discussing the value questions outright, even though that does not apply to individual scientists in their role of citizens. It is the task of democratic institutions to pinpoint the value conflicts involved and utilize available knowledge because for a problem as epistemically and ethically complex as climate change there is no single answer: “choices must be made.” (Sarewitz 2004: 390). Science will be less controversial once decisions have been made.

5 References

- Agarwal, Anil; Narain, Sunita. 1996 [1991]. *Global warming in an unequal world: A case of environmental colonialism*. New Delhi: Centre for Science and Environment.
- Apel, Karl-Otto. 2000. "Globalization and the Need for Universal Ethics". *European Journal of Social Theory* 3 (2), 137–155.
- Bätge, Dennis; Blundell, Anna; Gerr, Wolfgang D.; Gotthelf, Andreas; Hüsing, Bianca; Liesert, Reinhardt. 2013. "Well-Ordered Science in a Not Well-Ordered Society". In Kaiser, Marie I.; Seide, Ansagar (eds.). *Philip Kitcher: Pragmatic Naturalism*. Berlin: De Gruyter, 77–90.
- Berlin, Isaiah. 1969. *Four Essays on Liberty*. Oxford: Oxford University Press.
- Berlin, Isaiah. 1969. "Introduction". In *Four Essays on Liberty*. Oxford: Oxford University Press, ix–lxiii.
- Bluhm, Robyn. 2012. "Book Review: Philip Kitcher's 'Science in a Democratic Society'". *The Journal of Philosophy, Science & Law* 12 (July 17), 1–4.
- Bohman, J. 1998. "Survey article: The coming of age of deliberative democracy". *Journal of Political Philosophy* 6 (4), 400–425.
- Bostrom, Ann; O'Connor, Robert E.; Böhm, Gisela; Hanss, Daniel; Bodi, Otto; Ekström, Frida; Halder, Pradipta; Jeschke, Sven; Mack, Birgit; Qu, Mei; Rosentrater, Lynn; Sandve, Anethe; Sælensminde, Ingrid. 2012. "Causal thinking and support for climate change policies: International survey findings". *Global Environmental Change* 22 (1), 210–222.
- Boykoff, Maxwell T.; Boykoff, Jules M. 2004. "Balance as bias: Global warming and the US prestige press". *Global Environmental Change* 14 (2), 125–136.
- Brosch, Tobias; Patel, Martin K.; Sander, David. 2014. "Affective Influences on Energy-Related Decisions and Behaviors". *Frontiers in Energy Research* 2, 1–12.
- Brown, Mark B. 2009. *Science in democracy: Expertise, institutions, and representation*. Cambridge Mass.: MIT Press.
- Brown, Mark B. 2013. "Philip Kitcher, Science in a Democratic Society: A Review of Science, Learning and Policy". *Minerva* 51 (3), 389–397.
- Bush, Vannevar. 1945. *Science, the endless frontier. A Report to the President [on a program for Postwar Scientific Research]*. Washington, DC: United States Government Printing Office.
- Clarke, L.; Jiang, K.; Akimoto, K.; Babiker, M.; Blanford, G.; Fisher-Vanden, K.; Hourcade, J.-C.; Krey, V.; Kriegler, E.; Löschel, A. 2014. "Assessing Transformation Pathways". In Edenhofer, O. et al. (eds.). *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, U.K.: Cambridge University Press, 413–510.
- D'Agostino, F. 2013. "Science in a Democratic Society: By Philip Kitcher". *Analysis* 73 (3), 593–594.
- Depkat, Volker. 2008. *Geschichte Nordamerikas: Eine Einführung*. Köln: Böhlau.
- Douglas, Heather. 2013. "Philip Kitcher: Science in a Democratic Society". *The British Journal for the Philosophy of Science* 64 (4), 901–905.
- Douglas, Heather E. 2009. *Science, policy, and the value-free ideal*. Pittsburgh, Pa: University of Pittsburgh Press.

- Dupré, John. 2013. "Science in a Democratic Society: By Philip Kitcher. New York: Prometheus Books, 2011. Pp. 270. Price £24.95". *The Philosophical Quarterly* 63 (251), 408–410.
- Edenhofer, O.; Pichs-Madruga, R.; Sokona, Y. 2014. "Preface". In Edenhofer, O. et al. (eds.). *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, U.K.: Cambridge University Press, ix–xi.
- Edenhofer, O.; Pichs-Madruga, R.; Sokona, Y.; Farahani, E.; Kadner, S.; Seyboth, K.; Adler, A.; Baum, I.; Brunner, S.; Eickemeier, P.; Kriemann, B.; Savolainen, J.; Schlömer, S.; Stechow, C. von; Zwickel, T.; Minx, J. C. (eds.). 2014. *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC. Cambridge, U.K.: Cambridge University Press.
- Edenhofer, O.; Pichs-Madruga, R.; Sokona, Y.; Kadner, S.; Minx, J. C.; Brunner, S.; Agrawala, S.; Baiocchi, G.; Bashmakov, I. A.; Blanco, G.; Broome, J.; Bruckner, T.; Bustamante, M.; Clarke, L.; Conte Grand, M.; Creutzig, F.; Cruz-Núñez, X.; Dhakal, S.; Dubash, N. K.; Eickemeier, P.; Farahani, E.; Fischel, M.; Fleurbaey, M.; Gerlagh, R.; Gómez-Echeverri, L.; Gupta, S.; Harnisch, J.; Jiang, K.; Jotzo, F.; Kartha, S.; Klasen, S.; Kolstad, C.; Krey, V.; Kunreuther, H.; Lucon, O.; Masera, O.; Mulugetta, Y.; Norgaard, N. B.; Patt, A.; Ravindranath, N. H.; Riahi, K.; Roy, J.; Sagar, A.; Schaeffer, R.; Schlömer, S.; Seto, K.-C.; Seyboth, K.; Sims, R.; Smith, P.; Somanathan, E.; Stavins, R.; Stechow, C. von; Sterner, T.; Sugiyama, T.; Suh, S.; Ürges-Vorsatz, D.; Urama, K.; Venables, A.; Victor, D. G.; Weber, E.; Zhou, D.; Zou, J.; Zwickel, T. 2014. "Technical Summary". In Edenhofer, O. et al. (eds.). *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, U.K.: Cambridge University Press.
- Feyerabend, Paul. 1982 [1978]. *Science in a free society*. London: Verso Editions.
- Field, C.B.; V.R. Barros; D.J. Dokken; K.J. Mach; M.D. Mastrandrea; T.E. Bilir; M. Chatterjee; K.L. Ebi; Y.O. Estrada; R.C. Genova; B. Girma; E.S. Kissel; A.N. Levy; S. MacCracken; P.R. Mastrandrea; L.L. White (eds.). 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability: Summaries, Frequently Asked Questions, and Cross-Chapter Boxes. A Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC. Geneva: World Meteorological Organization.
- Field, C. B.; Barros, V. R.; Mach, K.J., Mastrandrea, M.D.; van Aalst, M.; Adger, W. N.; Arent, D. J.; Barnett, J.; Betts, R.; Bilir, T. E.; Birkmann, J.; Carmin, J.; Chadee, D. D.; Challinor, A. J.; Chatterjee, M.; Cramer, W.; Davidson, D. J.; Estrada, Y. O.; Gattuso, J.-P.; Hijioka, Y.; Hoegh-Guldberg, O.; Huang, H. Q.; Insarov, G. E.; Jones, R. N.; Kovats, R. S.; Romero-Lankao, P.; Larsen, J. N.; Losada, I. J.; Marengo, J. A.; McLean, R. F.; Mearns, L. O.; Mechler, R.; Morton, J. F.; Niang, I.; Oki, T.; Olwoch, J. M.; Opondo, M.; Poloczanska, E. S.; Pörtner, H.-O.; Redsteer, M. H.; Reisinger, A.; Revi, A.; Schmidt, D. N.; Shaw M.R.; Solecki, W.; Stone, D. A.; Stone, J.M.R.; Strzepek, K. M.; Suarez, A. G.; Tschakert, P.; Valentini, R.; Vicuña, S.; Villamizar, A.; Vincent, K. E.; Warren, R.; White, L. L.; Wilbanks, T. J.; Wong, P. P.; Yohe, G. W. 2014. "Technical Summary". In Field, C.B. et al. (eds.). *Climate Change 2014: Impacts, Adaptation, and Vulnerability: Summaries, Frequently Asked Questions, and Cross-Chapter Boxes. A Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: World Meteorological Organization, 35–92.

- Gaillard, Maxence. 2013. "The governance of 'Well-Ordered Science': from ideal conversation to public debate". *THEORIA* 28 (2), 245–256.
- Groth, Sylvia. 2001. „Die Klitoris: Das verlorene, fragmentierte und wiederentdeckte Lustorgan der Frau“. In Groth, Sylvia; Rásky, Éva (eds.). *Sexualitäten: Interdisziplinäre Beiträge zu Frauen und Sexualität*. Innsbruck: Studien-Verlag, 93–107.
- Groth, Sylvia; Rásky, Éva (eds.). 2001. *Sexualitäten: Interdisziplinäre Beiträge zu Frauen und Sexualität*. Innsbruck: Studien-Verlag.
- Hansen, James; Kharecha, Pushker; Sato, Makiko; Masson-Delmotte, Valerie; Ackerman, Frank; Beerling, David J.; Hearty, Paul J.; Hoegh-Guldberg, Ove; Hsu, Shi-Ling; Parmesan, Camille; Rockstrom, Johan; Rohling, Eelco J.; Sachs, Jeffrey; Smith, Pete; Steffen, Konrad; van Susteren, Lise; Schuckmann, Karina von; Zachos, James C. 2013. "Assessing 'dangerous climate change': required reduction of carbon emissions to protect young people, future generations and nature". *PloS one* 8 (12), e81648.
- Harmon, Joseph E.; Gross, Alan G. (eds.). 2007. *The scientific literature: A guided tour*. Chicago, Ill: University of Chicago Press.
- Hegerl, G. C.; Zwiers, F. W.; Braconnot, P.; Gillett, N. P.; Luo, Y.; Marengo Orsini, J. A.; Nicholls, N.; Penner, J. E.; Stott, P. A. 2007. "Understanding and Attributing Climate Change". In Solomon, S. et al. (eds.). *Climate Change 2007: Working Group I: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, U.K.: Cambridge University Press. 663–746.
- Holzleithner, Elisabeth. 2009. *Gerechtigkeit*. Wien: Wiener Universitätsverlag.
- IPCC. 2013. *Principles Governing IPCC Work. Appendix A: Procedures for the preparation, review, acceptance, adoption, approval and publication of IPCC reports*. <http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-appendix-a-final.pdf>. (12 Nov. 2013).
- IPCC. 2014. "Summary for Policymakers". In Edenhofer, O. et al. (eds.). *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, U.K.: Cambridge University Press.
- IPCC. 2015. *Climate change 2014: Synthesis report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: IPCC.
- Jasanoff, Sheila. 2010. "A New Climate for Society". *Theory, Culture & Society* 27 (2-3), 233–253.
- Joireman, Jeff; Barnes-Truelove, Heather; Duell, Blythe. 2010. "Effect of outdoor temperature, heat primes and anchoring on belief in global warming". *Journal of Environmental Psychology* 30 (4), 358–367.
- Kaiser, Marie I.; Seide, Ansagar (eds.). 2013. *Philip Kitcher: Pragmatic Naturalism*. Berlin: De Gruyter.
- Keren, Arnon. 2013. "Kitcher on Well-Ordered Science: Should Science Be Measured against the Outcomes of Ideal Democratic Deliberation?". *THEORIA* 28 (2), 233–244.
- Kitcher, Philip. 2001. *Science, truth, and democracy*. Oxford: Oxford University Press.
- Kitcher, Philip. 2011. *Science in a democratic society*. Amherst, NY: Prometheus Books.
- Koertge, Noretta. 2013. "Science in a Democratic Society, by Philip Kitcher". *Mind* 122 (488), 1116–1120.

- Krosnick, Jon A.; MacInnis, Bo. 2012. *Trends in American public opinion on global warming policies between 2010 and 2012*. <https://woods.stanford.edu/sites/default/files/files/GW-Policy-Trend-2010-2012-1.pdf> (11 July 2014).
- Kuipers, Theo A. F. (ed.). 2007. *General philosophy of science: Focal issues*. Amsterdam: North Holland.
- Leiserowitz, Anthony; Maibach, Edward; Roser-Renouf, Connie; Feinberg, Geoff; Howe, Peter. 2012. *Climate change in the American mind: Americans' global warming beliefs and attitudes in September, 2012*. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication. <http://environment.yale.edu/climate/files/Climate-Beliefs-September-2012.pdf> (4 Aug. 2014)
- Leiserowitz, Anthony; Maibach, Edward; Roser-Renouf, Connie; Smith, Nicolas; Dawson, Erica. 2013. "Climategate, Public Opinion, and the Loss of Trust". *American Behavioral Scientist* 57 (6), 818–837.
- Li, Ye; Johnson, Eric J.; Zaval, Lisa. 2011. "Local warming: daily temperature change influences belief in global warming". *Psychological science* 22 (4), 454–459.
- Mahner, Martin. 2007. "Demarcating Science from Nonscience". In Kuipers, Theo A. F. (ed.). *General philosophy of science: Focal issues*. Amsterdam: North Holland, 515–575.
- Mastrandrea, M. D.; Field, C. B.; Stocker, T. F.; Edenhofer, O.; Ebi, K. L.; Frame, D.J.; Held, H.; Kriegler, E.; Mach, K. J.; Matschoss, P.R; Plattner, G.-K.; Yohe, G. W.; Zwiers, F. W. 2010. *Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties*. IPCC. <http://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf> (05 May 2016).
- Moore, Alfred. 2012. "Philip Kitcher: Science in a Democratic Society. 270 pp., bibl., index. New York: Prometheus Books, 2011. \$28 (cloth)". *Isis* 103 (4), 815–816.
- Oreskes, Naomi. 2004. "The scientific consensus on climate change". *Science* 306, 1686–1686.
- PEW. 2011. *Modest rise in number saying there is "solid evidence" of global warming: More moderate Republicans see evidence of warming*. www.people-press.org/2011/12/01/modest-rise-in-number-saying-there-is-solid-evidence-of-global-warming/ (16 Jul. 2014).
- PEW. 2013. *GOP deeply divided over climate change*. <http://www.people-press.org/2013/11/01/gop-deeply-divided-over-climate-change/> (16 Jul. 2014).
- Pfeifer, Volker. 2009. *Ethisch argumentieren: Eine Anleitung anhand von aktuellen Fallanalysen*. Braunschweig: Bildungshaus Schulbuchverlage.
- Pieper, Annemarie. 2007. *Einführung in die Ethik*. (6th edition). Tübingen, Basel: Francke.
- Rawls, John. 1999 [1971]. *A theory of justice*. (Rev. ed.). Oxford: Oxford University Press.
- Resnik, David B. 2000. "A pragmatic approach to the demarcation problem". *Studies in History and Philosophy of Science Part A* 31 (2), 249–267.
- Richardson, Henry S. 2014. "Science in a Democratic Society by Philip Kitcher". *Kennedy Institute of Ethics Journal* 24 (1), E-106-E-109.
- Rudner, Richard. 1953. "The Scientist Qua Scientist Makes Value Judgments". *Philosophy of Science* 20 (1), 1–6.
- Sarewitz, Daniel. 2004. "How science makes environmental controversies worse". *Environmental Science & Policy* 7 (5), 385–403.

- Scruggs, Lyle; Benegal, Salil. 2012. "Declining public concern about climate change: Can we blame the great recession?". *Global Environmental Change* 22 (2), 505–515.
- Selinger, Evan; Crease, Robert P. (eds.). 2006. *The philosophy of expertise*. New York: Columbia University Press.
- Simmons, A. John. 2010. "Ideal and Nonideal Theory". *Philosophy & Public Affairs* 38 (1), 5–36.
- Solomon, Miriam. 2006. "Groupthink versus The Wisdom of Crowds: The Social Epistemology of Deliberation and Dissent". *The Southern Journal of Philosophy* 44 (S1), 28–42.
- Solomon, S.; Qin, D.; Manning, M.; Chen, Z.; Marquis, M.; Averyt, K.B.; Tignor, M.; Miller, H.L. (eds.). 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC. Cambridge, U.K.: Cambridge University Press.
- Steele, Katie. 2012. "The Scientist qua Policy Advisor Makes Value Judgments". *Philosophy of Science* 79 (5), 893–904.
- Stocker, T. F.; Qin, D.; Plattner, G.-K.; Alexander, L. V.; Allen, S. K.; Bindoff, N. L.; Bréon, F.-M.; Church, J. A.; Cubasch, U.; Emori, S.; Forster, P.; Friedlingstein, P.; Gillett, N.; Gregory, J. M.; Hartmann, D. L.; Jansen, E.; Kirtman, B.; Knutti, R.; Krishna Kumar, K.; Lemke, P.; Marotzke, J.; Masson-Delmotte, V.; Meehl, G. A.; Mokhov, I. I.; Piao, S.; Ramaswamy, V.; Randall, D.; Rhein, M.; Rojas, M.; Sabine, C.; Shindell, D.; Talley, L. D.; Vaughan, D. G.; Xie, S.-P. 2013. "Technical Summary". In Stocker, T. F. et al. (eds.). *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, U.K.: Cambridge University Press, 33–118.
- Stocker, T. F.; Qin, D.; Plattner, G.-K.; Tignor, M.; Allen, S. K.; Boschung, J.; Nauels, A.; Xia, Y.; Bex, V.; Midgley, P. M. (eds.). 2013. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, U.K.: Cambridge University Press.
- Swim, Janet K.; Stern, Paul C.; Doherty, Thomas J.; Clayton, Susan; Reser, Joseph P.; Weber, Elke U.; Gifford, Robert; Howard, George S. 2011. "Psychology's contributions to understanding and addressing global climate change". *The American psychologist* 66 (4), 241–250.
- TNS Opinion & Social. 2014. *Special Eurobarometer 409: Climate change*. European Commission. http://ec.europa.eu/public_opinion/archives/ebs/ebs_409_en.pdf (08 Aug. 2014).
- UNFCCC. 1992. *The United Nations Framework Convention on Climate Change*. http://unfccc.int/files/essential_background/convention/background/application/pdf/convention_text_with_annexes_english_for_posting.pdf (02 Jul. 2015).
- UNFCCC. 2015. *Paris Agreement*. http://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english.pdf (10 Mar. 2016).
- Vincent, K. E.; Tschakert, P.; Barnett, J.; Rivera-Ferre, M. G.; Woodward, A. 2014. "Cross-chapter box on gender and climate change". In Field et al. (eds.). *Climate Change 2014: Impacts, Adaptation, and Vulnerability: Summaries, Frequently Asked Questions, and Cross-Chapter Boxes*. A Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva: World Meteorological Organization, 107–109.
- Weber, Max. 1995 [1919]. *Wissenschaft als Beruf*. (corrected reprint). Stuttgart: Reclam.

- WEF. 2014. *Global Risks 2014: Ninth Edition*. World Economic Forum. Geneva.
<http://reports.weforum.org/global-risks-2014/> (23 Jul. 2014).
- Weinberg, Justin; Elliott, Kevin C. 2012. "Science, Expertise, and Democracy". *Kennedy Institute of Ethics Journal* 22 (2), 83–90.
- Wilholt, Torsten. 2014. "Philip Kitcher: Science in a Democratic Society". *Philosophy of Science* 81 (1), 165–171.

6 Appendix - Abstracts

ENGLISH ABSTRACT

This thesis aims to provide a philosophical evaluation of Philip Kitcher's *Science in a Democratic Society*. Kitcher develops a normative system for integrating science and democracy even though they are fundamentally asymmetric: the former elitist, the latter egalitarian. The scope of this book is vast but the pragmatic perspective on which Kitcher rests his argument provides an opportunity for assessment. The proposals are assessed by their capacity to advance a solution to the problem of climate change. In particular, it is evaluated if the proposed citizen juries, as a participatory democratic tool can traverse the fact-value divide more successfully than present institutions.

The ideals in SDS only illustrate the characteristics of a solution. The rationalist elements undermine practical guidance, because the ideal becomes indeterminable. Thereby, the justification of science as the single epistemic authority is undermined, as it requires alignment with the value positions developed by that ideal procedure. Citizen juries plausibly lead to a more balanced governance and reception of science. However, the legitimization of such a completely novel democratic institution is severely neglected, even though the historical contingency of political institutions is discussed at length.

GERMAN ABSTRACT

Diese Diplomarbeit untersucht das normative Model präsentiert in *Science in a Democratic Society* von Philip Kitcher. Dieser kombiniert Wissenschaft und Demokratie in einem System, das den essenziellen Unterschied in deren Organisationsformen, elitär und egalitär, zu verbinden sucht. Das Thema ist also sehr umfassend, jedoch bietet Kitcher's Pragmatik unmittelbar einen Ansatz zur Bewertung. Die Vorschläge werden daher an ihrem potentiellen Beitrag zur Klimadebatte gemessen. Im speziellen ist zu erforschen ob Bürgerkomitees (citizen juries) als partizipativ-demokratisches Werkzeug die Trennung zwischen Tatsachen und Werten besser überbrücken könnten, als dies gegenwärtige Institutionen tun.

Die Ideale umreißen eine mögliche Lösung nur grob. Die rationalistischen Elemente verhindern praktische Handlungsanweisungen, weil der Idealzustand unbestimmbar wird. Folglich kann dieses Verfahren auch nicht die Autorität der Wissenschaft stützen, weil dies eine Ausrichtung anhand der Werte aus dem Ideal benötigen würde. Bürgerkomitees überzeugen als sachkundiger Dialog, der eine Alternative zu gegenwärtigen Entscheidungsprozessen bieten könnte. Allerdings wird die demokratische Legitimation solch einer neuartigen Institution gänzlich vernachlässigt, obwohl die Kontingenz politischer und epistemischer Institutionen ausgiebig besprochen wird.