Three essays on our planetary future

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Abstract

This thesis propounds a techno-environmentalist position. Seeking to combine the need for natural restoration with human development, the thesis explores to what extent more radical forms of ecological modernization can offer a basis for political compromise and open new paths to global long-term sustainability. Based on three published articles, the thesis engages with existing literature on (a) intergenerational justice, (b) sustainable development, and (c) political economy.

Written as a normative inquiry, the thesis advances the "planetary future" as a generative political metaphor. Reflecting the tension between natural dependency and human freedom, this metaphor aims not only to remind us of our shared vulnerability, as engendered by ecological decay and omnicidal weapons, but also to inspire a sense of global political agency. By taking the Enlightenment idea of a self-directing democratic future to the planetary level, the thesis hopes to turn our attention to the possibilities of human agency and help to spark a debate about what we, as an emerging planetary civilization, can hope to achieve in the century ahead.

At the same time, the thesis seeks to offer an epistemological and political critique of its own macro-level perspective on human history, arguing that a one-sided focus on the "big picture questions" of humanity can risk relativizing local struggles for sustainability and trivialize more grounded forms of knowledge. Contrary to the managerial approach of Earth System Analysis and other similar perspectives, the thesis emphasizes the need for political deliberation and the value of diversity, both in its own right and as a source of social innovation.

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"The eyes of the future are looking back at us
and they are praying for us
to see beyond our own time"

Terry Tempest Williams

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This book is my doctoral dissertation. As such, it also reflects my personal journey through the world of higher learning. It is a journey that has taken me from the green college fields of America to the industrial heartland of China, from the seminar room in Lund to a number of international conferences, but most of all, deeper into scholarly reflection about the future of humanity.

For many parts, it has been a depressing journey. Never before has one species come to dominate the biosphere, ruthlessly destroyed natural habitats and put its own existence at risk to such an extent. The more we understand about the gravity of our predicament, the less optimistic we become about our chances. Yet, if anything, this book is a challenge to think boldly about what could be possible, to imagine what the future could be if there existed a sense of global political agency, and a call for us to make good on the promise of the Enlightenment.

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1. INTRODUCTION

Unlike more traditional dissertations in political theory, this thesis is not written as a monograph but consists of three articles already published in academic journals. The articles are preceded by an introductory chapter.

Taken together, the thesis aims to (a) establish the need for a long-term planetary perspective in politics, (b) illustrate how such a perspective can help redefine the current debate on sustainability by shifting the focus from the risks engendered by modernity to the possibilities provided by accelerated socio-political globalization and radical technological innovation, and (c) situate these arguments in relation to existing theories on intergenerational justice, sustainable development and political economy.

While the articles engage with these issues at a substantive policy-oriented level, the introductory chapter aims to provide a meta-level critique of the long-term planetary perspective which implicitly informs the articles. In the introduction I will argue that, beneficial as such a perspective may be for inspiring a sense of global political agency, it is a perspective that also risks relativizing local struggles for sustainability and trivialize more grounded forms of knowledge.

Throughout the articles, I have come to propound a techno-environmentalist or "eco-Promethean" position which ultimately seeks a complete decoupling of human and nature, a disengagement of economy from ecology in order to simultaneously enable both habitat restoration and human development.[1] This position differs from established interpretations of ecological modernization theory both in terms of its radical scope and its dependence on the making of bold political decisions. Many readers will most certainly disagree with this radical normative position and disdain about its chances for success. Far from seeing this as a failure for my argument, I hope that any sincere attempt to identify the causes of disagreement will help to elucidate our current historical situation and, with it, the difficult choices we have to make in these times of rapid environmental and human change. In the end, I want the thesis to be read essentially as a call for a new democratic debate about the future of humanity.

2. SETTING THE STAGE

The more we learn about the vulnerability of our planet and the risks ahead, the less appropriate it seems to embrace a spirit of hope. Yet, having spent the last half decade studying the politics of sustainability, I have become ever more convinced about the need for a new "provocative optimism" regarding the human prospect. Without a doubt, the challenges ahead are staggering. We are living through a time when many of our previous gains have proven illusionary or untenable, a time in which modernity itself has come under siege and a time in which we have to seek out radically new pathways to freedom and prosperity.

Under such disorienting circumstances, it is not surprising that sentiments of fear and bewilderment have come to dominate much of our thinking about the future. Catastrophic visions of runaway climate change, ecosystem collapse and worsening resource scarcity have all helped to paint a grim picture of the century ahead. Meanwhile, far less attention has been given to the question what we, as an emerging planetary civilization, can hope to achieve over the course of the same time. Sparked by that initial question, the three articles comprising this thesis can be read as an attempt to reclaim the Enlightenment idea of a self-directing democratic future (Bronner, 2004, pp. 17-40; Habermas, 1989; Johnson, 2004). Though anchored in different literatures, the articles are unified in the belief that a safe passage through the twenty-first century will require not only robust knowledge about the risks we face but also an informed political debate about what kind of planetary future it is that we collectively want to achieve. While much of that debate will always have to be in the negative as in how to avoid some truly dystopian futures (Baccolini & Moylan, 2003), competing positive visions appear equally crucial, not only from the perspective of democratic theory (Karlsson, 2005), but also more generally as means of orientation in times of unfolding contingency and existential risk (Bostrom & Cirkovic, 2008; Grunwald, 2007).

Unlike a placeless "global present", the "planetary future" then becomes a strong generative metaphor as it merges the limitations of the natural world with the fundamentally open character of the human enterprise into a site of political activity (Dobson, 2009; Schön, 1993). Epitomized in the whole earth

iconography, as in the planet seen from outer space, it is a political perspective that mirrors not only the shared vulnerability engendered by ecological decay and omnicidal weapons but also our common responsibility for the future of humanity (Deudney, 1995, p. 140). Yet, just like a local short-term perspective, such a planetary long-term perspective does not in itself imply any specific normative orientation. It is merely an empty container, a cognitive space onto which we can project and debate competing political visions. But unlike more limited local perspectives, a long-term planetary perspective does imply the existence of a homogenous isotropic global space with a continuous nature of extension or, in the language of historiography, the existence of a shared, universal history of humanity, a notion that clearly is not without its own problems (Chakrabarty, 2008, p. 187). We know that eco-feminist, post-structural and post-colonial theorists have all voiced legitimate concerns about its epistemological foundations and inherent biases (Sardar, 1999; Vázquez-Arroyo, 2008). At the same time, I remain convinced that a long-term planetary perspective is worth exploring even as we must engage in a critical dialogue about its rightful limitations. More specifically, I hope to provide a critique of both the empirical and normative reasons as to why the articles have come to adopt this particular perspective on time and space. Before doing that however, I would like to say something more general about what kind of scientific project this thesis represents and also briefly discuss the methodological assumptions of the individual articles.

2.1 Methodological approach

From the beginning, my research interest has been more oriented towards the normative-analytic than the empirical-predictive aspect of future studies. Instead of forecasting the future, I have been asking what a *desirable* planetary future would look like. Yet, even such a normative inquiry depends on the making of certain empirical and probabilistic assumptions and we cannot therefore judge its value entirely independent of these prognostic elements. In concrete terms, many of the normative arguments made in the following will rest on the environmental realist claim (Dunlap & Catton, 1994) that the world is in a state of worsening ecological overshoot by which its resources and sinks are exploited beyond their sustainable levels (Meadows, Meadows, & Randers, 2004). At the same time, much is written

in the hope that this state of overshoot is neither so acute nor so irreversible that all political action has already become effectively meaningless.

Between these positions one can imagine there to be a window of civilizational opportunity during which a range of different futures may be attainable, some of course more probable than others. The main thrust of my normative argumentation has been to bring attention to the political nature of this situation and to argue that the variety of possible planetary paths reflects a number of underlying ideological choices that ought to become subject to democratic decision-making. By taking up that position, I am not only rejecting more deterministic or post-modern theories but also trying to make a positive case for the view that the planetary future should be seen as a domain of human choice, albeit one which is subject to certain bio-physical limitations. Any attempt to more specifically define those limitations or, in other words, to form the explanatory base necessary to estimate the range of possible futures, will inevitably take us outside the "comfort zone" of political theory and into the contested terrain of climate models, technology forecasts and other similar projections. Though obviously perilous I believe that, in order to remain policy relevant, a project of this kind must to some extent engage with these kind of constrains, even if it makes it susceptible to a wide spectrum of possible criticism.

As for the analysis of the more genuine normative issues at stake, the brevity of the article format has occasionally made it difficult to provide sufficient grounding and justification. To some extent I hope to use this introduction to compensate for these externally imposed restrictions since I am of the belief that, unlike unmediated political opinion, the value of normative political theory ultimately depends on its criticizability, intelligibility and openness to counter-arguments. Though these standards of intersubjectivity should apply to all scientific activities, they clearly take on a special significance in a project which sets out to study something as expansive as the "future of humanity". Despite such efforts it is obvious that we cannot help telling one possible story while ignoring others. That however does not by itself render such a bold stroke approach meaningless, but it should remind us that, when working at this high level of abstraction, our aim cannot so much be scientific closure as an invitation to further debate and knowledge production.

Turning to the individual articles, each is somewhat different in terms of underlying normative logic or methodological approach. The first article, *Reducing Asymmetries in Intergenerational Justice,* is the most philosophical in the compilation, being set within the popular tradition of Rawlsian contractualism. In the article I suggest that present generations have come to exercise a disproportional influence on the life prospects of future generations and that justice requires us to seek a more symmetrical distribution of responsibility.

Operating with the notion of a hypothetical contractual situation known as the "original position", the logic of Rawlsian contractualism serves to substantiate our ethical and political reasoning within a framework that would be acceptable to everyone from a position of equality. Since real-world interactions between humans rarely take place from such a position of equality, Rawlsian contractualism famously suggests that we imagine the original position to be situated behind a "veil of ignorance", a veil that effectively occludes all knowledge about our particular place in society, our class position or social status, and even our own personal abilities, assets or liabilities (Rawls, 1999b, p. 11). Then, instead of thinking of how to advance our own standing, we are to formulate principles of justice that are suitable to govern the basic structure of society over time.

While other interpretations certainly are possible, I would say that the primary aim of Rawlsian contractualism is to provide a pragmatic exercise in impartiality (Kymlicka, 2002, p. 63), a powerful tool capable of uncovering social injustices and taking the perspective of the least advantaged. With its insistence on fair procedure, democratic equality and the attribution to "each person an inviolability founded on justice that even the welfare of society as a whole cannot override" (Rawls, 1999b, p. 3), contractualism firmly leads our thinking towards reciprocity and reflection about our own partiality.

Intergenerational contractual justice tries to extend this call for reciprocity beyond the present (Shrader-Frechette, 1991, pp. 67-81). By doing away with temporal limitations on who constitute our moral community, it reminds us that present actions have come to increasingly determine the life prospects of future generations and that this may give rise to entirely new ethical

obligations (Jamieson, 1992). At its core lies the deceptively simple question: "what would we want the present generation to do if we were in the shoes of some future unborn generation?" (Epstein, 1992, p. 84). While it may seem straightforward enough to simply widen the original position so that it also includes future generations, the resulting issues of futurity have proven to be extremely difficult to accommodate while maintaining overall theoretical consistency (Mulgan, 2006, pp. 39-50). Familiar notions of justice, equality and utility that all yield "reasonable conclusions for fixed population sizes over short periods begin to produce bizarre results once cohort sizes or total population sizes or both vary over time" (Laslett & Fishkin, 1992, p. 1). One problem that has proven to be particularly intricate is what, in the terminology of Amartya Sen, is called "focal group plasticity":

> "Suppose there are two institutional structures *A* and *B* that would yield, respectively, five million or six million people. Who, we have to ask, are included in the original position in which social decisions are made that would inter alia choose between *A* and *B* and thus influence the size and composition of the respective population groups?" (Sen, 2002, p. 461)

While this paradox is briefly mentioned in the article, I am afraid that it is given far from the attention that it deserves. Though I have tried to rectify that elsewhere (Karlsson, 2007), it is clear that contractual conceptions of intergenerational justice remain haunted by a whole set of different repopulation paradoxes, including the notorious non-identity problem (Beckerman & Pasek, 2001; Page, 2006; Parfit, 1984). In the name of fairness it should be noted that this situation is by no means unique to contractualism (Humphrey, 2009). In fact, competing approaches such as utilitarian consequentialism tend to lead our thinking into even deeper waters, often arriving at conclusions that rightfully have been classified as "repugnant" (Parfit, 1984, p. 388; Ryberg, 1996).

To the non-specialist reader, all this may seem rather academically remote from real-world political debates. Yet, there is something disturbing about the fact that our leading moral theories appear to be failing when confronted with what many perceive as the most pressing ethical problems of our time such as

global climate change. While considerable progress has been made in recent years on a number of these problems (C. Hare, 2007; Heyward, 2008; Partridge, 2002; Reiman, 2007), it is nonetheless clear that much philosophical groundwork remains to be done.

Moving on to the second article, *Inverting Sustainable Development?*, its normative logic may appear fairly primitive in comparison. Trying to avoid some of the abstruse technicalities of contractualism, the article is built around a basic consequentialist norm of "quality survival" for present and future generations (Cocks, 2003, p. 143). Intuitively appealing as such a norm of intergenerational conduct may sound, it leaves a lot of loose threads in its wake. Not only does it remain agnostic as to the more specific meaning of "quality survival", it also fails to give any guidance on thorny issues such as preferred future population size (Räikkä, 2000), the moral status of the non-human natural world (Eckersley, 1992) and the fair sharing of burdens associated with environmental change (Page, 2008). Despite these and other short-comings, I believe that the norm of "quality survival" is appropriate for the article since it helps putting the focus on the substantive ideas rather than their meta-ethical foundations.

Inspired by the discipline of future studies, this second article sets out to (re)construct three different visions of the future, two found in the existing literature on global sustainability and one that I suggest has been discursively excluded in contemporary policy debates. Such visions of the future, constituting modal narratives about what could be possible (Booth, Rowlinson, Clark, Delahaye, & Procter, 2008), are inevitably somewhat speculative in nature. The farther we look into the future, the larger does the dialectic gulf between necessity and possibility become (van der Helm, 2009, p. 101). The picture is further complicated by our epistemological limitations; given the complexity and non-linearity of many biophysical systems, we cannot for instance know how resilient the natural environment will ultimately turn out to be nor what absolute limits there may be to our own ability to adapt (Adger, et al., 2009). Taking such cognitive constraints into account, it is obvious that our focus must again be on the substantive ideas. Instead of constructing imaginative and detailed fables of alternative worlds, the future is

primarily used as a visualization tool to bring out possible ramifications of existing ideas.

Finally, turning to the third article, *A Global Fordian Compromise?,* it represents yet another step away from the philosophical towards the political. Written as a critical literature review, its normative elements are not situated within any overarching ethical framework capable of providing further justification for the values it advocates. Some may dispute whether it is at all possible to do political philosophy in this way without references to moral philosophy, especially once we introduce an intergenerational dimension (Mulgan, 2006, p. 21). Others may see this as a strength rather than a weakness since it allows for the building of political consensus in spite of remaining disagreement on deeper philosophical issues (J. Barry, 1999, p. 26). By shying away from often interminable foundational debates, the article tries to bridge polarized positions on global sustainability and on that basis articulate a possible provisional compromise. Inspired by the grand historical compromise of welfare capitalism, its aim is to find similar ground for pragmatic agreement (Nachi, 2004) and thereby avoid the closure and perfectionism characteristic of more utopian reasoning (Pepper, 2005).

Worthwhile as such an objective may seem, it also accentuates a host of methodological questions about the proper relationship between philosophy and "real politics". Unlike Raymond Geuss and others who reject the need for abstract "ideal theory" and argue that all political thinking should be historically situated and action-oriented (Geuss, 2008), I believe that it is rather the interaction between universal principles and pragmatic considerations that gives life to political theory and makes it a fascinating activity. The gradual shift from theory to practice in the articles should therefore not be interpreted as a renunciation of more "aspirational" theories (Estlund, 2008) or the need to think systematically about what could be possible under idealized circumstances (such as full-compliance). Instead, my ambition has been to provide arguments at different levels of abstraction and to let the three articles complement each other by offering different approaches to the same substantive issues.

To conclude this brief methodological primer, I would like to return to the question of how this scientific project relates to existing work on the future of humanity. It is my impression that while different risks associated with environmental and technological change have attracted a lot of scientific interest, relatively scant attention has been paid to the possibilities of human agency and initiative, in particular with regard to our chances of consciously and democratically deciding our common future. In very simplistic terms, it seems as if there has been far more focus on the risks than the possibilities of the future. It is not difficult to think of a number of reasons for this imbalance. First, while many of the risks we face are possible to quantify or estimate, Karl Popper and others have persuasively shown that since the future course of human history will (at least to some extent) depend on the growth of scientific knowledge, which per definition is unknowable in advance, there are absolute epistemological limits to our ability to predict the future (Lagerspetz, 2004; Popper, 2002). Second, in the social sciences, it has for some time become much more fashionable to deconstruct and criticize existing power structures than to construct positive visions of the future. While this may partially reflect a sound scepticism about macro-level theorizing and the possibility of keeping political meaning constant over time (Freeden, 2009), I think it is also warranted to talk about a prevailing "utopophobic" tendency, a tendency which does not seem to be in keeping with a broader historical perspective and the fundamental socio-political changes that de facto have taken place over the last centuries. Finally and somewhat more speculative, it is conceivable that our collective imagination is simply more easily stirred by dystopian vistas and cataclysmic events than by the hard work of institution building and the gradual improvement of the human condition.

Yet, few would deny that, in the past, aspirational visions have played a profound role in human history. Ideas and ideals that grew out of the Enlightenment have to come to shape the very constitution of our societies, as evident in everything from legal equality to representative democracy. Looking ahead it seems as if our ability to reignite our sense of historical agency and once again to formulate new bold visions will be highly dependent on to what extent we will be able to reclaim the future as an imagined space of collective action.

3. SPACE

The following two chapters will engage specifically with the *long-term planetary perspective* as it can be inferred from the articles, critically examining both its empirical and normative foundations. Moving from the spatial to the temporal, my aim is to establish the historical relevance of this perspective and to argue its continuing value to progressive thinking on global environmental change. At the same time, I wish to give voice to some of the criticism that has been levied against this kind of universalization of human history, including its blindness to its own epistemic location. Without jumping too much ahead here, I believe that such critical perspectives can offer important correctives to the way we understand our planetary future and remind us about the crucial role of self-reflection within the Enlightenment tradition (Allenby, 2009).

3.1 Empirical reasons for adopting a planetary perspective

I will begin this chapter by discussing some of the empirical reasons behind the choice of the planetary as the implicit spatial category in the three articles. I will then turn to the normative side of the issue, investigating the corresponding philosophical and moral reasons for adopting this particular scale level.

An initial word on terminology may here be in order. When talking about, respectively, empirical and normative reasons, I am trying to draw an analytical distinction between those reasons that are contingent on the external world and those reasons that are derived from normative theory. Obviously, this is a division made more for pedagogical purposes than in reflection of some unambiguous ontological dualism. As clear-cut as the Humean distinction between "is" and "ought" may seem when analyzing primitive propositional statements, every additional semantic layer makes it more difficult to disentangle descriptive and evaluative statements. Just as value judgements are involved in the selection of what empirical problem to investigate, few normative theories can subsist independently of all factual claims. Even so, I believe that working with these two analytical categories can help in structuring and evaluating the different kind of justificatory claims that can be made in support of a long-term planetary perspective in politics.

From the outset it is clear that the modern world has come to increasingly reflect human activities (Turner, et al., 1993). While many natural and social processes remain distinctively local, the last hundred years have fundamentally changed the spatial extension of our actions, all up to a point where anthropogenic drivers have become the dominating factors at the planetary level (Vitousek, Mooney, Lubchenco, & Melillo, 1997). Affecting a range of biophysical systems, the impacts of human actions have become so broad and deep that some have suggested that the planet has entered into an entirely new geological epoch, appositely referred to as the "Anthropocene" (Crutzen, 2002). Warranted or not, the math alone is daunting. With the world's population approaching seven billion and the per capita rate of environmental exploitation continuing to rise, ever greater strain is placed on the planet's ecological carrying capacity (Meadows, et al., 2004). In particular, accelerating land transformation, the rapid destruction of natural habitats and the alteration of numerous biochemical cycles, most notably the global carbon cycle, are worrying signs that we have began to tamper with the basic planetary life support systems, ultimately undermining the conditions that make our own existence possible (Rockström, et al., 2009b; Walker, et al., 2009).

It is this stark imagery of planetary crisis that motivates the political logic of the three articles. Unlike earlier more localized crises of ecological sustainability, I believe that the current situation owes its specificity precisely to its planetary proportions. While some authors have tried to build a case around analogous reasoning, comparing the present environmental crisis with the collapse of, for instance, the Maya or the Anasazi (Diamond, 2005), I would argue that the planetary scale in itself presents us with a number of unparalleled challenges (Coates, 2009). First, the planetary reach generates immense collective action problems not seen in any past local context (Andreou, 2006; Thompson, 2006). Second, since the impact of one individual or even one entire community remains negligible on the planetary scale, our sense of agency or moral responsibility becomes particular vulnerable to spatial fragmentation (Gardiner, 2006, p. 399). Third and finally, the planetary scale means that the survival of humanity itself may be at risk, something which, depending on one's moral outlook, may warrant specific ethical considerations (Leslie, 1996).

It is in response to these and other challenges that the planetary perspective has become the instinctive scale level in the articles. Not only are the articles informed by this planetary outlook on the risks facing humanity, the strategies for sustainability that they propose are also in themselves expressions of a visionary approach to planetary politics. Though easily conflated, it is worth pointing out this implicit leap, if nothing else as a reminder that the mere global scale of a problem does not necessarily mean that it calls for a global solution. In fact, the prospects for sustainability often explicitly depend on local knowledge and participation (Mauro, 2009, p. 117; Ruddle, 2000) or for that part on the enforcement mechanisms currently only available at the state level (Eckersley, 2004). At the same time, and as hopefully evident from especially the third article, the opposite can also be true, namely that by widening our quest for sustainability to the planetary level, new and hitherto unforeseen political strategies may become possible.

More generally, I believe that it is first when we lift our eyes towards the planet as a whole that we fully realize the fragility of the human enterprise. Thinking of our planet floating through the dark immensities of space, the commonality of our destiny becomes physically apparent (Heise, 2008, p. 22). As that mental image is turned into hard scientific data through space exploration, the "one world" metaphor becomes further solidified and substantiated (Fisk, 2008). However, important as this grand-scale view may be for humanity's ability to constitute itself as "humanity" (Hullot-Kentor, 1989, p. 13), it paradoxically carries the seed of one of the more powerful objections against the planetary perspective. With its panoramic view, concerned with macro-level processes and "big-picture questions", it runs the risk of rendering individual human beings invisible and stereotyping their experiences. As precedence is given to quantifiable decontextualized data derived from remote sensing systems, more contextually grounded forms of knowledge may become marginalized and leave vulnerable groups without voice (Kende-Robb & Van Wicklin, 2008; Pickles, 1994). This would be especially problematic in relation to environmental change where the impacts exhibit great spatial variability, falling disproportionately on the developing world and in particular on the "poorest of the poor" (Heltberg, Siegel, & Jorgensen, 2009; Mendelsohn, Dinar, & Williams, 2006; Olsson & Jerneck, 2008). As Karen Litfin puts it:

> "[T]he view from space renders human beings invisible, both as agents and as victims of environmental destruction. It also erases difference, lending itself to a totalizing vision. The 'global view' cannot adequately depict environmental problems because the impacts of these problems vary with class, gender, age, and race" (Litfin, 1997, p. 38)

Criticizing the abstractness of the planetary view, Litfin and other eco-feminist authors have called for an increased sensitivity to the particularism of place. Such a sensitivity seems crucial to remind us that even if global in scope, environmental problems always manifest themselves in the local realm and in relation to existing social power structures (Dodge & Perkins, 2009, p. 500; Seager, 1993, p. 272).

These issues take on a particular pertinence in the context of Earth system analysis (Schellnhuber, Crutzen, Clark, Claussen, & Held, 2004). Having established itself as the leading transdisciplinary approach to the study of global environmental change, Earth system analysis aims to provide a comprehensive predictive model of all the fundamental planetary processes, covering everything from oceanography and geology to atmospheric chemistry. Given the importance of anthropogenic drivers discussed above, there has been a growing desire to integrate not only natural but also human factors in these formalized models, ultimately enabling predictions about the "coupled human and ecological system" (Kotchen & Young, 2007, p. 149). Unsurprisingly, this expansion into the social domain has triggered a host of critical reflections (Clifford & Richards, 2005; Lövbrand, Stripple, & Wiman, 2009), especially in relation to the recent discursive shift from "monitoring" to "managing" the Earth system (Biermann, 2007). While something like Earth system analysis is obviously needed to make, for instance, climate-modelling at all possible, it is easy to see why its integrative ambitions depend on rather sweeping generalizations about human behaviour. In its striving for ever more parsimonious models (Cox, et al., 2006), it is simply not possible to take in all the overwhelming complexities of the social world. This may not necessarily be a problem for the modelling as such but if the resulting analysis is later used to inform policy, its reductive approach risks leading our thinking in a homogenizing direction and possibly away from more radical

ideas for sustainability. This risk is further accentuated by the excluding effects of formalized modelling. Once all the equifinal predictions and uncertainties have stifled into fixed policy options, it becomes very difficult for non-experts to challenge more basic premises and epistemological assumptions (Clifford & Richards, 2005, p. 381). That being said I believe that the most serious problem with Earth system analysis remains its aspiration for a God-like view of the planet (Garb, 1990, p. 266), a view not unlike that of many computer strategy games. Such a view easily lends itself to utilitarian calculations by which the overall mission, to operate or even optimize "the Earth system" (Schellnhuber, 1999, p. 23), is given priority over the tedious task of democratic deliberation across different cultures and worldviews.

To avoid this, and to remain attuned to the spirit of the Enlightenment, I believe that the planetary perspective must be paired with a vision of universal democracy capable of recognizing the value of diversity, both in its own right as a matter of democratic equality but also as a source of social innovation. Instead of trying to reduce the transition to sustainability into a kind of management problem best solved by technical experts, we should remember that despite all its complexities, the choice of our planetary future remains a profoundly political decision.

On an epistemological level, I think it is crucial to maintain a critical sensibility towards all claims of universal knowledge. That does not mean giving up on the emancipatory project of expanding universality or that we should stop resisting different exclusionary logics, but it means that we should remain aware of the Hegelian split between the *ideal universal* and the *concrete universal* (Balibar, 2002, p. 172). Especially when imagining something as expansive as the "planetary" as a political space, we should remember that many of our dreams or aspirations are embodied in our own particularity and that it will require a continuous critical effort to confront our own partiality (Aradau, 2004, p. 403). It is in light of this wider context that I think the story of Earth system analysis tells us something about the contentious epistemological questions that are at stake when moving between different scale levels and also why we should be careful about oversimplifying and stereotyping complex social processes (Shannon & Diehl, 2007).

3.2 Normative reasons for adopting a planetary perspective

Up till now, I have talked about the planetary perspective primarily as a reaction to an increasingly globalized world. This is also the way it is most often understood in the literature, that the global view is called for in response to the transboundary character of the problems we face. Given the extent to which our conceptions of human association remain essentially national (Bartelson, 2009), this line of thought should not be surprising. However, if we instead were to begin with a cosmopolitan ethic, the argument would start to flow in the opposite direction, that it is because of our moral allegiance to the world at large that we ought to consider the impacts of our actions even if these fall outside of our national context.

From a cosmopolitan viewpoint, the planetary perspective is warranted regardless of its instrumental value. It is a scale level that follows intuitively from the belief that all of humanity belongs to the same moral community. While presumably all cosmopolitans would affirm the intrinsic value of the global perspective along these lines, it is worth remembering that they would differ considerably as to its more precise political meaning (Caney, 2005, pp. 4-5) and as to what extent it is possible to even imagine a "democracy of mankind" (Abizadeh, 2005). In the articles, I take up a somewhat extreme position, defending a radical form of political cosmopolitanism which envisages a future that has transcended the war system (Held, 1995, pp. 276-277) through world federalism and in which human rights have become universally entrenched. Undoubtedly, one can think of a myriad of possible objections against this view, both philosophical and practical-political. Instead of rushing into the task of unwinding the vast literature on these objections, something that I believe has already been done with virtually unsurpassable mastery (Caney, 2005), I plan to take a somewhat different route, focusing my attention on to what extent it is possible to find a contractual grounding of political cosmopolitanism. That question matters, not only because the first of the three articles operates within a contractual framework, but because contractualism more generally allows us to think about what institutional arrangements free and equal persons would agree to under ideal conditions.

From the introduction we remember that Rawls introduced his hypothetical contractual situation behind the "veil of ignorance" as a kind of ethical lens that would filter out all knowledge capable of potentially distorting our moral judgements. The aim of the exercise was to arrive at a set of impartial principles of justice, principles that could be reflectively endorsed by all participating individuals autonomously and form the basis of social cooperation. From the very beginning, Rawls specified that while the veil of ignorance would occlude knowledge about such factors as gender, religious affiliation, wealth and even one's own conception of the good, it would not conceal what society the parties of the contract collectively belonged to. More correctly, the entire contractual exercise is premised on the assumption that it takes place within the context of one single "bounded society" (O'Neill, 2000) thought of as a scheme of mutual cooperation. This spatial restriction, that the scope of justice is limited to reciprocal relations *within* one state, puts Rawls's theory immediately at odds with more cosmopolitan conceptions of justice. When the restriction first appears it is in the shape of some rather innocent simplifying assumptions: "[l]et us assume, to fix ideas, that a society is a more or less self-sufficient association" (Rawls, 1971, p. 4) and, a few pages later, "I shall be satisfied if it is possible to formulate a reasonable conception of justice for the basic structure of society conceived for the time being as a closed system isolated from other societies" (Rawls, 1971, p. 7). However, later works (Rawls, 1993, pp. 255-288, 1999a) tell us that these assumptions are better understood as an expression of metaethical particularism than as a temporary philosophical scaffold (James, 2005). This is also the reason why critics of Rawls to such an extent have zoomed in on these assumptions.

In his 1979 book *Political Theory and International Relations*, Charles Beitz already argued that principles of distributive justice should apply to the global realm and that the assumptions made by Rawls are both empirically incorrect and theoretically misleading. For this he gives two main arguments. First, it is clear that the spatial distribution of natural resources is highly arbitrary. No country can make a moral claim that it deserves the minerals, hydrocarbons and other natural resources that it has been endowed with. Likewise, countries deprived of valuable natural resources suffer from an unfair disadvantage that limits their prospects of economic development. Fairness, according to

Beitz, therefore requires a global principle of distributive justice that can provide "assurance to persons in resource-poor societies that their adverse fate will not prevent them from realizing economic conditions sufficient to support just institutions" (Beitz, 1979, p. 142). Second, empirical data tells us that no state is self-sufficient in the manner that Rawls assumes (Arribas, Perez, & Tortosa-Ausina, 2009). Instead, all states are woven into a complex global web of exchange and cooperation as well as of exploitation. To assume self-sufficiency then becomes morally problematic since it means to disregard the extent to which the most abject class divisions have been externalized out of the welfare state. Given the continuing globalization of the world economy, Beitz concludes that "international economic interdependence constitutes a scheme of social cooperation like those to which requirements of distributive justice have often been thought to apply" (Beitz, 1979, p. 154) and if "evidence of global economic and political interdependence shows the existence of a global scheme of social cooperation, we should not view national boundaries as having fundamental moral significance" (Beitz, 1979, p. 151).

Yet, as Beitz himself was quick to note (Beitz, 1983, p. 595), there is something rather unsatisfactory with this way of criticising the assumptions made by Rawls. Instead of accepting that the scope of justice is turned into a contingent matter, dependent on the volume of international trade or whether that trade is mutually advantageous or not (B. Barry, 1991), a more fundamental line of criticism would be to ask why we at all should accept the Rawlsian premise that matters of justice only arise within one society (Cohen & Sabel, 2006). Since we know that borders "often divide not simply one jurisdiction from another, but the rich from the poor as well" (Blake, 2002, p. 257), it indeed becomes warranted to ask why something as arbitrary as place of birth should be allowed to play such an important role in our theories of justice (Moellendorf, 2002, p. 55), especially if we at the same time insist that ethnicity and language should not (Rawls, 1999b, p. 85). Clearly, people do not in any meaningful sense chose where to be born, yet it remains the perhaps single most determining factor in their lives, sometimes even literally deciding if they get to live or die. As Joseph Carens has pointed out, accepting this state of affairs means admitting an almost feudal notion of birthright privilege into the heart of our liberal theories of justice (Carens, 1992).

As seen in the first article, the obvious solution and the one favoured by a number of theorists (Beitz, 1983; Carens, 1987; Pogge, 1989; Richards, 1982), becomes to globalize the original position and extend the scope of justice accordingly (Gosepath, 2001). By adopting such an interpretation of the planetary perspective, we acknowledge that individuals everywhere are our moral equals and should all be represented in the choice of principles of institutional and background justice. If taken seriously, there are good reasons to believe that the parties to such a global contract would treat nationality no differently than other "deep contingencies […] like genetic endowment, race, gender, and social class" (Pogge, 1989, p. 247) and seek institutional arrangements capable of equalizing opportunities on a global level (Caney, 2001; Marchetti, 2008). Furthermore, given the extent to which the current state-based configuration remains prone to military conflict, I find it very unlikely that a hypothetical global contract would not include moves to seriously challenge the war system and its intentional mass killing in the name of the state (Falk, 1995, p. 244; Tännsjö, 2008, pp. 99-106). Taken together this should lead us to a contractual grounding of the kind of political cosmopolitanism advocated in the first article.

However, I fear that not everyone is persuaded by this quick philosophical move and the unapologetically universalistic stance that it arrives at. The idealistic pirouettes of contractual thinking above simply sit ill with the sordid realities of world politics. Even within the realms of philosophy, some virtue theorists like Alasdair MacIntyre would argue that patriotism is a precondition for morality itself and that we therefore cannot treat nationality as any other trait (MacIntyre, 1984, p. 11). Others, such as Charles Taylor or Yael Tamir, would defend metaethical particularism on grounds of cultural perfectionism and fear the blandness of a politically globalized world.

A unifying theme among many critics of political cosmopolitanism is that the levels of trust that democratic politics requires can only be attained by an affective identity stemming from a shared national culture (Abizadeh, 2002). David Miller has been one of the most vocal defenders of this view, arguing that national partially comes naturally to humans and that sufficient levels of trust and solidarity can only evolve within a bounded community (Miller, 1993, 1998). What such

an argument obviously misses is the coincidental nature of all existing states and the historically proven plasticity of communal affiliation. As David Weinstock has argued, "shared democratic institutions do not only *reflect* the democratic will of an antecedently existing political community [they can also] *create* community by engendering habits of cooperation and shared membership" (Weinstock, 2009, p. 93). In light of this possibility, the emergence of a global demos could depend as much on new planetary institutional arrangements as on a pre-existing sense of shared community. The United States could here serve as a particularly interesting example of how old cultural identities can be overcome and how new bonds of solidarity can be forged.

Yet, often when debating these issues it feels as if the hopes of cosmopolitanism founder on the sharp reefs of diverging fundamental social ontology. Some people simply insist that the world is darkening, that the rise of China will lead to an apocalyptic showdown between East and West (Babbin & Timperlake, 2006) or that the West is about to witness a clash of civilizations with the Islamic world. I believe neither. But I am afraid that part of that belief is based on a leap of faith, about having a vision of what a common civilization of humanity could look like, about being able to visualize a world of universal affluence and political equality. However, not in the least is this about being naïve or unaware of our dark history. It is rather about seeing that history and still being able to recognize what tremendous civilizational advancements have been possible over the last centuries in terms of democratic participation, gender equality and distributive justice. It is about seeing how Europe could come together in one democratic political union after uncountable wars. And then, when taking up the planetary view, we have to ask ourselves what would be required in terms of progressive politics to make such changes possible also on a global scale?

4. TIME

Having examined and debated the spatial dimension of the *long-term planetary perspective*, my ambition will now be to situate that global view in time. Again the quest for environmental sustainability will serve as the leitmotif but as we move from the empirical to the normative I will try to widen my inquiry to a number of more general problems in democratic theory.

4.1 Empirical reasons for adopting a long-term perspective

Just as modernity has fundamentally transformed the spatial extension and intensity of human activities, it has meant that our actions have come increasingly to affect the remote future. The surge in instrumental capacity has placed ever longer timescales under human influence, as perhaps most ominously illustrated by the risk of abrupt climatic shifts capable of taking the Earth system beyond certain permanent "tipping points" (Lenton, et al., 2008; Pimm, 2009). Even barring such dramatic events, it is clear that human activities will have biophysical consequences for many millennia to come.

In the same sense that I believe that our theories of sustainability must account for the planetary proportions of the current ecological crisis, I believe that they must offer credible transition strategies in response to the long-term challenges posed by environmental change (Hovi, Sprinz, & Underdal, 2009). Important as temporary mitigation efforts may be to buy time, the real challenge remains to find a shared global development path that can satisfy human needs over the coming centuries while avoiding destabilizing critical biophysical systems. When thinking about the political need for such longer time horizons, two issues seem to warrant particular consideration.

First, if anthropogenic stress levels continue to rise in the future as anticipated, many natural systems will come to exhibit non-linear, discontinuous and disruptive patterns of change. While it may be common within the liberal fold to assume that environmental change will always be slow and gradual, such an optimistic view has for long been considered outdated by ecological science (Wiman, 1991). Instead of benign linear behaviour, ecological science has repeatedly pointed to the time-lag and threshold effects inherent to much environmental change

such as the atmospheric build-up of green house gases (Scheffer & Carpenter, 2003). This ability of ecological systems to temporarily absorb stress may generate a sense of false security and lead us to underestimate the long-term costs of environmental degradation.

Second, prior knowledge does not seem to allow us to put sufficiently narrow bounds on the systemic risks of global environmental change. When listening to political debates, it is not unusual to hear that efforts to mitigate global environmental change are not cost effective, especially when the benefits they provide are distant and uncertain while the costs they incur are real and immediate. Such an argument is not unreasonable, especially when we think of how we normally assess the environmental impact of smaller local activities in terms of cost-benefit analyses. But when it comes to estimating the systemic risks associated with abrupt global environmental change, traditional cost-benefit analyses are of limited use since the downside exposure is potentially unlimited. Moreover, since the probability distribution of possible outcomes is characterized by "fat-tails", i.e. there is a low yet unquantifiable probability of truly catastrophic outcomes, Martin Weitzman and other leading environmental economists have suggested that we do better in thinking of environmental policy as a kind of insurance against the *worst* possible outcome (Weitzman, 2009). Just as one is prepared to pay a premium every month to protect one's home against the risk of catastrophic fire or flooding, it can be argued that we should set aside what is required to ensure that we remain inside the "safe operating space" of humanity with respect to the functioning of the Earth System (Rockström, et al., 2009b).

This combination of delayed feedback signals and existential risks clearly points to the need for longer proactive views on sustainability issues. While it was perhaps safe in the past to adopt a wait-and-see approach towards environmental change, the possibility of abrupt and irreversible changes has made such an approach appear less and less politically responsible (Wiman, 1991, p. 246). As the rate of global change continues to accelerate, driven by population growth, urbanization and deepening economic globalization, the human enterprise has increasingly become a planetary concern that unfolds along a single civilization-wide trajectory (Bostrom, 2009; Osborne,

1995, p. 34). Acknowledging this state of interdependence and shared planetary vulnerability, the question of scale again comes to the fore (Newman & Dale, 2009). Strategies for sustainability that could conceivably work in small, well-ordered and spatially localized contexts in the rich world, such as ruralization and a return to self-sufficiency, would most likely be outright ecologically devastating if implemented on a global level with a world population approaching seven billion (Lewis, 1992, pp. 82-116). Similarly, it is one thing to dream about a lost pastoral past but quite another thing to imagine the political process by which the world in the future could be brought back to such a state. Apparent as this tension between normative ideals and practical policy may seem, I believe it has significant implications for contemporary green political theory, something that I will here seek to illustrate in relation to the concept of "ecological space".

The intuition behind this popular concept is simple enough, that we take the ecological carrying capacity of the planet and divide it equally across the world population (Georgescu-Roegen, 1976). Each person is thereby given an arithmetic approximation of how much ecological space he or she is entitled to (Hayward, 2005, p. 324). This allotment is then contrasted with present demand for ecological goods and services, often phrased in the terms that if this or that particular lifestyle were to become universal, so and so many Earth-equivalent planets would be required (Moran, Wackernagel, Kitzesa, Goldfinger, & Boutaud, 2008, p. 472; Vanderheiden, 2009, p. 261).[2] Interpreted as a moral imperative, the argument normally goes that each of us has an ethical duty to cut back on consumption and other activities until we start to "occupy an appropriate amount of environmental space" (Dobson, 2007, p. 281). Given the gross disparities that prevail in the use of ecological space, an adjustment to an equitable average would mean a considerable drop in per capita consumption for the majority of the population in the industrial countries. Ethically desirable or even necessary as such a reduction may seem at the individual level (Wapner & Willoughby, 2006), it is far from certain that the macro-level effects of its universalisation would be at all ecologically benign. Once we make the move from a static snapshot division of resources in the present to the long-term sustainability prospects of different planetary trajectories, we realize exactly how far global consumption levels would have to

fall in order to restore a stable equilibrium with the natural world. We also realize that any dramatic reduction in aggregate demand would risk seriously destabilizing the world's socio-economic systems by creating a worsening deflationary spiral, especially if paired with other similar green recommendations such as large voluntary reductions in family size (Yea, 2004; T. Young, 2001). As evident from the articles, I believe that such a destabilization would most likely impair rather than improve the prospects for sustainability. In particular, it is difficult to see how it would be possible to finance large-scale green innovation if the economy were to fall into a prolonged period of contraction (Lewis, 1992, p. 9). That being said, there is an equal risk that the complexities of global change are taken as a stock excuse for inactivity and political apathy.

The challenge thus consists in formulating theories of sustainability that are both economically and politically feasible in a pluralistic world yet capable of delivering tangible environmental improvements both now and into the future. Instead of mortifying ourselves to fit into a shrinking individual ecological space as the world becomes more crowded, all of the articles converge on the need to redefine the entire equation of sustainability so that it can accommodate a future in which all of us will be able to enjoy a high level of material welfare while maintaining and restoring the integrity of the natural world (T. P. Young, Petersen, & Clary, 2005).

In practical terms I have argued that this would mean to use eco-Promethean breakthrough technologies to overcome the logic of scarcity that underpins much green thinking (Nordhaus & Shellenberger, 2007, p. 15). The livestock sector can here serve as a highly illustrative example of the direction of change that I envision. Instead of calculating the absurdities of feeding enough domestic animals to support a future in which Western diet patterns have become universal, the development of in-vitro meat (Edelman, McFarland, Mironov, & Matheny, 2005) seems to enable precisely the kind of "decoupling from nature" that appears necessary, especially in light of the fact that livestock already today is responsible for more greenhouse gas emissions than all modes of transportation combined (FAO, 2006, p. 272). In a similar fashion, molecular engineering and other forms of productive nanosystems may eventually enable entirely closed-loop material flows (R. Baum, 2003; Drexler, 2005; Jones, 2008)

while space colonization holds the promise of a vastly expanded resource base as well as access to new sources of energy (Reed & Willenberg, 2009).

In all this, longer time scales seem essential, not only to remind us that the most formidable problems of sustainability are most likely still ahead of us, but also to allow us to identify alternative pathways and recognize to what extent the future remains open to human choice. Yet, just as the large-scale planetary view can risk marginalizing local knowledge, the focus on remoter global futures may abstract and relativize the struggle for sustainability here and now. This risk may be of particular concern for those who interpret the quest for sustainability primarily in voluntarist terms as an individual, moral obligation in line with an "environmental citizenship" (Dobson, 2003). Even among more structurally oriented theorists, there is a concern that the vastness of the long-term challenge of sustainability may overshadow what can and should be done today. This debate is of course not only about the time scales employed but also a reflection of the more general question of what a transition to sustainability actually would look like and then in particular in relation to the modern project. While some authors make clear that their "starting premise is that techno-industrial society is […] fundamentally unsustainable" (Rees, 2006, p. 221), others like myself would argue that the capitalist democracies are uniquely equipped to lead the transition towards an innovation-driven future and long-term sustainability. This tension is well covered in all of the three articles and it is not my intention to say something substantively new about it here in the introduction. However, returning to the question of time scales, I think there are a few interesting observations to be made.

First, there appears to be a tendency, on both sides of the debate, to pay too much attention to near-term tests of what more appropriately should be treated as still largely undetermined long-run trends (Chenowetha & Feitelson, 2004; Cole, 2005). Triumphal as cornucopians have been about history falsifying the predictions made by for instance Paul Ehrlich in the late sixties (such as that, by the year 2000, life expectancy in the United States would be 42 years due to pesticide use or that hundreds of millions would suffer from mass starvation in India), the Neo-Malthusian camp has been equally quick to ignore the deep uncertainties associated with future technological evolution and

dismiss its potential wholly on the basis of what existing technologies have been able to deliver in terms of improved eco-efficiency (York, Rosa, & Dietz, 2005).

Second, it seems as if the longer time scales we use, the less sustainable do traditional green visions appear, even if we decide to look beyond the problems of transitioning to such a future. As the cumulative probability of fatal, yet theoretically preventable, disasters (such as bolide collisions) increases monotonically over time, we may have come to underestimate the long-term risks of maintaining a "low-tech" civilizational configuration. Even if the complete extinction of humanity by external forces may seem unlikely in the short-term, global pandemics and other similar threats clearly point to the value of advancing life science and medicine. Though admittedly speculative, it can also be argued that while the range of risk scenarios may be broadening even along paths of accelerating technological evolution, the risk of human extinction is likely to diminish once we advance beyond the current "critical phase" of modernity, especially if we at one point will be able to establish large self-sustaining colonies on other planets in the solar system and beyond (Zubrin, 1996).

Third and finally, by taking a step back and looking at the longer picture of human evolution we may begin to see the sustainability crisis in somewhat different terms. Instead of treating the escalating environmental destruction as ultimate evidence of social and political failure, we can see it as painful feedback signals in a longer civilizational learning process. After all, it is hard to imagine how a planetary civilization would be able to develop without at some point confronting its bio-physical limitations (S. D. Baum, 2010, p. 595). The question is rather if we, in time, will be able to overcome the traumatic character of our initial encounter with modernity and use the knowledge we have gained to find a more sustainable trajectory into the future. By subscribing to this kind of pragmatic idealism (Sanderson, 2009), we introduce a sense of humility towards our shortcomings at the same time as we reaffirm the Enlightenment idea that progress, however fragile and conditional, remains possible.

4.2 Normative reasons for adopting a long-term perspective

If we allow these three observations to set the stage, I will now again attempt the move from empirical to normative justification. Unlike the spatial dimension, where we could easily identify specific normative positions such as nationalism or cosmopolitanism, beliefs about our moral obligations to the future obviously evade such simple classifications. Instead of pursuing an analogous contractual argument (a task already undertaken in the first article), my ambition here will first be briefly to situate these ideas historically and then to try spell out more specifically the implications of different time horizons (Luhmann, 1976) in relation to democratic theory.

It is commonplace to argue that the Enlightenment "discovered" the future. Yet, rough as such statements will always be, I think it is difficult to underestimate the role that this shift in political perception played in the making of modernity (Carvounas, 2002, p. 12). Instead of perceiving the future as closed or exclusively determined by transcendental forces, the beginning of the modern era marked a pronounced change in time awareness which effectively transformed the future into a socially dependent quantity (Bergmann, 1992, p. 90; Nassehi, 1994, p. 49). With the invention of an "open future" there was suddenly a shared cognitive space onto which competing political ideas could be projected. Equally ground-breaking was the closely associated idea that not only could the future be planned, it could also become subject to democratic decision-making.

While always an easy target of authoritarian contamination, the notion of self-directing historical change gradually became entrenched in the wake of the Enlightenment. In this regard, the American revolutionary experience served as an initial beacon of its potential, just as the French Revolution a decade later revealed the risks of insufficient separation of powers and the need to moderate political will-formation with a system of checks and balances, institutional accountability and the rule of law (Bronner, 2004, p. 39). As history progressed into the 20th century, the full significance of the "open future" would eventually become apparent. Yet, paradoxically, just as the world witnessed the extremes of on one hand totalitarian planning and on the other progressive social democratic change (Berman, 2006), the future once again began to be perceived as closed or

determined by forces beyond democratic control. Today, despite all the indisputable evidence of social change in the last centuries, the notion of a self-directing democratic future has come to be seen as antiquated and naïve. Overwhelmed by the risks engendered by modernity (Ekberg, 2007) but also by the complexities of facilitating political change in an accelerating globalizing world (Rosa, 2003; Scheuerman, 2004), the "notion of the future itself becomes tenuous as it collapses into an extended present" (Reith, 2004, p. 392). Studying the sociology of time there is a surprising degree of consensus about the empirical factuality of this process (Adam, 1990; Bauman, 1992, p. 190; Harvey, 1990, pp. 285-307; Nowotny, 1994) and even if it may not hold up for each and every field of political activity, few would dispute the more general claim that there has been a loss of confidence in our ability to democratically decide the long-term future (Schedler & Santiso, 1998, p. 6; Touraine, 2001, p. 1).

Taking this empirical claim as my starting point, I will now try to abstract the question of political time horizons to a more theoretical level. Drawing on my 2005 article in *Futures*, it can be argued that the domain of possible political actions is dependent on the time horizons we employ (Karlsson, 2005). From a practical point of view this would mean that our time horizons define the set of possible political options perceived to exist at a particular point in time. Obviously, the realization of grand political projects, such as the lunar landings, depended on the capacity of the political system to plan ahead. But also on a more fundamental cognitive level, our very ability to think of politics as an activity of forward projection depends on the existence of future empty time. In a democratic context, this ability translates into the difference between a mandate theory of elections in which parties formulate alternative platforms promising to translate them into government policy if elected and the view that elections are primarily an instrument for retroactive accountability (Schedler, 1998).

Phrased as a normative argument, long time horizons seem desirable since they bring out the fundamental primacy of politics and remind us that, with sufficient time for policy formation, our political institutions have the capacity to shape the history of the future. With a shrinking distance between the present and the future, this sense of political agency easily becomes dissolved in

the face of mounting structural pressure. Instead of proactively planning and debating a transparent collective future, the political system becomes trapped in the present and finds itself confronted with a constant flow of unyielding structure. In other words, if politics loses its element of self-conscious forward movement into the future, it stands the risk of being reduced into little more than different "fire-fighting" activities in response to an accelerating stream of exogenous shocks and emergencies (Reith, 2004, p. 391). Without a dynamic projection into the future and a genuine debate about the desired direction of change, it also becomes difficult to make sense of the present. Deprived of integrative narratives capable of "connecting the dots", our understanding of the world breaks down and instead of long processes we see random crises that all call out for our political attention. Unable to identify the underlying chains of social and economic causality, the political system has no choice but to fall into a reactive post-ideological mode of policy making.

It is for these reasons that I believe that the hope of progressive politics depends on its ability to reclaim the future as a site for social innovation and democratic choice. By treating the future as fundamentally open, the articles in this volume can all be read as articulations of this hope and as different attempts to challenge from within the deterministic, economic narrative of globalization by pointing to the possibilities of democratically guided forms of capitalism. While it is commonly argued that the accelerating pace of social and environmental change has made all future-oriented thinking meaningless (Allmendinger, 2002, p. 28), I would say that it is precisely under such conditions that we need more comprehensive forms of political analysis and debate. Though we may have good democratic reasons for maintaining a piecemeal incrementalist approach to the design of actual policy measures (Lindblom, 1959), overcoming the "temporal myopia" (Bindé, 2000, p. 52) that currently prevails in the public debate seems urgent, not only for orientation purposes, but also for regaining the political initiative and reconstituting our sense of historical agency (Levitas, 2000a, p. 209).

Difficult as it may seem to forge new progressive narratives in a globalizing and interdependent world, I think it is a fallacy to believe that earlier generations were simply endowed with a more benign or intelligible social ontology. Thinking again of the historical compromise of welfare capitalism (as discussed in the

third article), it also came about in times of social turbulence, stark class conflict and apparently irreconcilable epistemological positions. While there may be many signs of a "crisis in historicity" (Jameson, 1984, p. 71), it is still an open political question if we will be able to break with the current passivity towards the future and formulate new progressive visions of human prosperity and natural restoration. It is in this vein that I have argued the value of "provocative optimism". While dystopian images may be powerful rhetorical reminders of the gravity of our predicament (Hjerpe & Linnér, 2009, p. 236), their negative appraisal of the future is rarely sufficient to bring about political mobilization or to inspire true transformative change. At the same time, there exists a vast literature on the dangers of utopian reasoning with ample warnings of where perfectionist totalizing visions of the future may lead (Berlin, 1990; Popper, 2002; Wallerstein, 1998). Obviously, our hope therefore hinges on the possibility of – once again – being able to find a middle-road of "utopian realism", one that allows us to tap into the transformative energy of utopia yet at the same time embrace provisionality, reflexivity and pluralism (Levitas, 2000b, p. 40).

5. CONCLUSIONS

Much as I relish the prospect of a more active engagement with our planetary future, there are obviously strong tendencies in the opposite direction. With our collective imagination "darkened by portents of decline, disaster and chaos" (Lowenthal, 1995, p. 391), the long-term future seems increasingly to become a source of consternation rather than transformative hope. In lieu of a promising global future, many retreat into more mundane private futures while others seem to put their hopes in Green or, for that part, Neo-liberal millenarianism (Pepper, 2005). Under such circumstances it may seem very idealistic to believe that the future could once again become subject to public debate and conscious democratic choice.

However, retreating from the planetary future does not mean that it goes away. Not only are an increasing number of our problems both transboundary and intertemporal, many of them also remain frustratingly out of reach for national politics while strategies of national encapsulation no longer seem to offer viable alternatives over time, not even for the greatest powers. As Ulrich

Beck has noted, national security can, in a borderless age of risks, no longer be confined to *national* security (Beck, 2005). Whereas it was perhaps safe to ignore problems in distant lands in the past, it is becoming obvious that what we ignore today will inevitably come back and bite us tomorrow. Climate change may here be the example par excellence with its causes and effects spatially and temporally dispersed and "seriously back-loaded" (Gardiner, 2006, p. 403), its consequences often indirect and extending throughout numerous domains such as public health, international migration, and national security (Randers, 2008, p. 863). As I have argued above, I believe that in order successfully to address the root causes of such problems, and not only their surface appearances, we need forward-looking shared visions that can create "counter-stories" of progressive global change.

By default, such stories also implicitly suggest a particular scale-political understanding (González, 2006, p. 838), a way of perceiving time and space. One aim of this introduction has been to problematize this scale level in relation to more local forms of knowledge. Beyond these epistemological considerations, a few things should be said about the political dimensions of this particular scale level.

First, and contrary to what is habitually assumed by many in the post-colonial fold (Sardar, 1999), I would argue that a transnational future-oriented approach has not in any meaningful way been the "dominant paradigm" over the last centuries. One just has to think of the nuclear arms race during the Cold War or our deep dependence on fossil fuels to realize that the norm has rather been a short-term state-based logic and that even now, in times of rampant economic globalization, political cosmopolitanism remains the exception. And though some may think of the European Union as an expanding "Atlantic nucleus" of democracy laying ground for world federalism (Straus, 1999), others probably see the same union as nothing but yet another (military) superpower in the making.

Second, and this follows somewhat from the previous point, by insisting, as I do in the articles, on a transnational future-oriented view, established discourses on sustainability are implicitly challenged. In particular, critical attention is directed to the role that the migration or displacement of polluting industries has played in reducing emissions in the rich countries (Kellenberg,

2009). While it may be easy for mainstream politicians in a country like Sweden to talk about the "dematerialization of the economy" (Kander, 2005), such claims become more difficult to sustain when one includes data on the North-South trade and the way a relatively clean consumption-oriented service economy in the rich countries is made possible by the existence of pollution-intensive production in the poor countries of the world (Copeland & Taylor, 2004). On the other hand, this criticism can also fire in the opposite direction by challenging the run-of-the-mill anti-capitalist discourse which fails to recognize how international trade has made possible the stellar economic growth and improvement in living standards in countries such as South Korea (Sangho, Hyunjoon, & Donghyun, 2009). Moreover, by taking a longer view, a transnational future-oriented view complements the one-sided analysis of environmentalists who only see the "negative" consumption-side of a richer and more equal world while ignoring the innovation capacity that comes with tens of millions of new engineers, scientists and an overall more educated work force.

Third and finally, in itself, the very act of thinking about our planetary future in terms of progressive change helps to disprove the post-modern claim that the world has become unintelligible and too fragmentary for politics to provide meaningful collective pursuits. Such an effort differs from the mere "deconstruction" and criticism of existing power structures as it provides a cognitive space that can accommodate visions of the future linked to the present by identifiable narratives of change. By publically debating such competing visions it is my hope that we can slowly restore the notion of the future as something open and amenable to human intervention. At the same time, this does not mean that we should give in to utopian dreaming; there are very real economic, technological, and social constraints that define what we can possibly hope to achieve, at least in the near future. If I am allowed to return one last time to the example of welfare capitalism, I believe that it is necessary to formulate visions that in a similar manner are capable of mustering support from across society, visions that do not depend so much on individual moral betterment as on the definition of new collective projects of transformative change.

However, even if that turns out to be possible, there will most certainly be disagreement. Every attempt to organize the past and the future into a coherent narrative, to provide "political meaning" as it were, is likely to raise questions about one's own epistemic location, especially when attempting to debate something as contentious as the "future of humanity". Yet, as I have argued above, I think it is a mistake to believe that this would be something fundamentally new or a result of some "post-modern condition". With the memory of the disastrous religious wars that preceded them, the thinkers of the Enlightenment insisted on tolerance, effective limits on authority and the primacy of critical reflection precisely because they realized that human knowledge and its aspirations always emanate from specific standpoints. Rather than taking this lack of "homogeneity" as proof that liberal democracy is impossible (Mouffe, 2000, p. 38), it is rather the reason why we need negotiation, deliberation and, ultimately, preference aggregation through majority voting.

5.1 Main arguments

While I, as promised, intend to leave much of the policy discussion to the individual articles, I would like to conclude this introduction by revisiting some of the main arguments developed in the articles in relation to the notion of a "planetary future".

To begin with the darkest of horizons, we know that literary fiction abounds with descriptions of what the end of humanity will look like (Baccolini & Moylan, 2003; Paik, 2010). Also from a scientific point of view it is clear that humanity faces a long list of serious problems, including global climate change, disruptive technology, nuclear annihilation and catastrophic celestial events (Coates, 2009; Morgan, 2009). While the extinction of humanity from such single sources remains an unquantifiable possibility (Leslie, 1996; Tonn & MacGregor, 2009), it is surprising how little attention moral philosophers and political scientists alike have paid to the possibility of systemic collapse or, to put it in more allegorical terms, to "death by a thousand cuts" (O'Neil, 2009). Though probably far more realistic than the standard all-out apocalyptic event, studies of cascading risks and the possibility that compounding crises will outrun our ability to deal with them politically are few and far between (Tainter, 1988; Walker, et al., 2009). This risk of

systemic collapse becomes particularly troubling in light of the previous discussion on contracting time horizons and its implications for the resilience of our democracies.

While it may be pretty straightforward to identify climate stability and the avoidance of nuclear war as our foremost duties from a survivalist point of view, the political debate on how to actually discharge these duties in practice takes us right back to the foundational questions about the modern enterprise. Applying a multidecadal to centennial time scale, there is much supporting the view (as developed in the first article) that we will be faced with some kind of civilizational bifurcation which will either force us down along an eco-radical agenda of de-urbanization, de-growth and ultimately back-to-land primitivism (Zerzan, 2008) or in the opposite direction along a global high-energy path of eco-Promethean growth towards the stars (Costanza, 1999; Lewis, 1992). While there are of course other possible scenarios in between these extremes, including a slow burnout or recurrent cycles of growth and collapse, these tend to become less probable as overall toxification levels increase, non-renewable resources dry up and substitution requires ever more advanced technology (or expansion outside the physical limits of the planet).

My contribution to this debate has been to argue that, far from being the business-as-usual scenario as some want us to believe (Lomborg, 2001)[3], the emergence of a planetary civilization based on liberal democratic values and buoyed by breakthrough technologies will require some very conscious and bold decisions in the not so distant future.

Yet, given the uncertainty associated with the development of the underlying technologies, it is not surprising that few politicians are willing to put their political capital at risk for eco-Promethean strategies which we cannot know beforehand will actually work. To redirect vast resources from military to civilian purposes and to initiate new Apollo-style programmes (as I suggest in the first two articles) may clearly seem like a risky bet. However, that risk has to be weighed against (a) the risks of maintaining our current trajectory of ecological overshoot or (b) the almost certain human suffering that would follow from the realization of any eco-radical agenda. While pragmatic forms of ecological modernization (such as higher environmental taxes or

new low-carbon infrastructure) may buy more time, the magnitude of the challenge we will face as billions of people assume Western consumption patterns (B. Hare & Meinshausen, 2008; Sheehan, 2008), clearly points to the inadequacies of such middle-of-the-road strategies.

Acknowledging that both action and inaction carry risks, the transition to sustainability remains essentially a *political* question about what kind of global future we would like to see realized. While we can hope for science to identify and quantify the operating space of human civilization (Rockström, et al., 2009a) as well as monitor the effects of our choices (Oreskes, 2004), the direction of where we want to go, including what risks we are willing to take, are all fundamentally normative decisions.

Much as eco-radicals like to declare that our current civilization suffers from chronic "system failure", they remain far less articulated about what controlling entities would be required to enforce their own monolithic vision of human history. By projecting a near absolute choice between the natural and the human world, they not only ignore to what extent an accelerated rate of technological development is prone to be "crucial for dealing with the ecological devastation brought about by modernity" (Bronner, 2004, p. 160), they also fail to consider the temporary nature of any de-modernization programme. While an eco-Promethean strategy of the kind discussed in the articles would presumably lead to a permanent decoupling of human and natural activity (except for recreation purposes and the like), a reversed strategy aimed at reintegrating humanity with nature would constantly be threatened by resurging waves of re-modernization and new unsustainable patterns of resource exploitation. In order to prevent such activity, the political control would have to be almost total and also enforced worldwide over very long time spans, all in obvious tension with the eco-radical yearning for small, decentralized social entities and the devolution of political authority. Even within one community, it seems to me that the realization of eco-radical visions would require either (a) universal compliance based on the homogenization of individual preferences or (b) far-reaching controls on individual behaviour including the curtailing of reproductive rights (Lewis, 1992, p. 37). From a democratic perspective, it is reasonable to have serious qualms about the desirability of a political programme based on either one of these

premises, especially when factoring in how ideologically remote such a programme seems to be from the views held today by most voters in the industrial democracies.

In response to such qualms, eco-radicals often resort to different forms of environmental determinism (arguing that the biophysical limitations of the planet trump all other ethical or political considerations). It is also common to hear the argument that worsening ecological degradation will eventually lead to stronger political support for eco-radicalism, in particular if more moderate forms of environmentalism will prove incapable of preventing dangerous environmental change. The obvious problem with that paradoxical hope is that, at such a critical point, there may not be much natural environment left to salvage. However, similar problems of political mobilization may affect also the kind of eco-Promethean strategies that I have been advocating. Without a political debate about the long-term future, the macro-level choice implicit in the notion of a civilizational bifurcation may not even surface until our planetary resources are virtually exhausted and, by then, it is uncertain if we will still have the material base necessary to climb to the stars.[4] For those who assume a strictly neutral time preference, the risk that humanity in this manner will be "trapped" in its planetary cradle, and thereby prevented from securing its long-term survival, constitutes an almost overriding concern (Leslie, 1996; Rogers, 2006; Shapiro, 2009). Even if we allow for intergenerational discounting, it does not take much in terms of imagination to realize that, given the enormity of the universe and the open-endedness of the future, we have a profound ethical responsibility to consider the long-term implications before making (possibly irreversible) decisions that would forestall a human future in space.

At any rate, I think we can all agree that the stakes of the last half century have been unprecedented in human history. Yet, despite growing concern for catastrophic climate change, all this may seem very remote from the day-to-day political world. In a sense that is of course a good thing since life is not only about surviving but also about actually living. But I think it is fair to say that the time during which we can continue walking "backwards into the future" is about to run out. Standing at the brink of a looming eco-catastrophe, it is uncertain for how long we will have the privilege of reflection and debate. My fear is of

course that when that time runs out, there will be rampant radicalization and that the hope of building a planetary future on the Enlightenment legacy of cosmopolitan sensitivity, liberal democracy and scientific reasoning will fade.

* * *

[1] The three articles use a somewhat different terminology when referring to this techno-environmentalist position. In the first article, it is described as an "ascent from modernity", in the second article as an "inverted form" of sustainable development and, finally, in the third article, the term "advanced technological paths to sustainability" is used. When writing the introduction I felt the need to use a more consistent terminology. Inspired by the work of Martin Lewis, I have therefore decided to use the term "eco-Promethean" whenever I refer to this techno-environmentalist position. For an exhaustive comparison of how this normative position differs from eco-radical forms of environmentalism, please see Lewis (1992:253-256).

[2] While such calculations may be useful for identifying the dangers of consumption, it is worth remembering that they say nothing about the productive possibilities that would exist if everyone in the world were to enjoy for instance Western living standards.

[3] In the name of fairness it should be noted that Bjørn Lomborg, in his most recent book, recognizes the need for massive investments in long-term R&D in order to mitigate global environmental change (Lomborg, 2010).

[4] As argued by J Richard Gott in his 1993 *Nature* article: "the [...] argument suggests that there may be only a brief window of opportunity for space travel during which we will in principle have the capability to establish colonies (which could in turn establish further colonies). If we let that opportunity pass without taking advantage of it we will be doomed to remain on the Earth where will eventually go extinct" (Gott, 1993, p. 319).

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