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Social Futures of Global Climate Change:

A Structural Phenomenology

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Abstract Despite compelling scientific research that affirms the reality of climate change, including global warming, social and political engagement with the issue remains highly contested. To identify the cultural and social structurings of alternative approaches to climate change, this study draws on a temporally theorized “structural phenomenology” of social action and organization. Through hermeneutic analysis, it examines selected prominent contemporary constructions of global climate change. The general framework of structural phenomenology, orthogonal to, but compatible with, field theory, is used empirically to identify various wider social *domains* of action. The cultural structures of domain practices are described by how they operate through, span, or hybridically combine

alternative *registers* of temporally structured meaningful action – each with its distinctive meaningful logic. The study examines cultural structures in four domains concerned with global climate change – science and policy analysis, conservative skepticism and denial, geopolitical security, and environmental movements. Climate-change constructions within these four domains differ in the ways that they compose various registers among diachronic, strategic, pre-apocalyptic, and post-apocalyptic social action temporalities. The general potential of structural phenomenology for re-envisioning institutional arrangements of modern societies is considered, as are the implications of the analysis for research on and social engagements with climate change.

Keywords: climate change; temporality; fields; institutions; phenomenology

Stark differences in contemporary understandings about the character, causes, and appropriate responses mark global climate change as a central challenge of our times, a challenge intensified by the very high stakes – the future character of human civilization. Alternative orientations – from denial to policy interventions, and on to survivalism – seem so disparate as to transcend the “communicative rationality” that Habermas (1987) promoted as a basis for civil society. The social and meaningful bases and implications of discourses about climate change are thus the subject of an emerging diverse body of social research. In the present essay, I

extend this research by examining how orientations toward climate change are structured in alternative domains of collective action. I do so by using a “structural phenomenology” focused on social temporalities of action and organization. The empirical analysis is directed to understanding cultural logics of action oriented toward the future in four key domains where climate change is framed as a critical issue – science and policy analysis, conservative skepticism and denial, geopolitical security, and the environmental-movement milieu. These domains, though prominent, are hardly equal in their capacities to exercise power, nor are they necessarily mutually oriented toward political struggle over conflicting goals. Examining their cultural constructions of the future thus offers a basis for understanding the terms under which contemporary challenges of global climate change unfold across a range of domains that transcend any particular field – even what Bourdieu (1991; 1996a) characterized as the encompassing field of power. As Hulme (2009) argues, responding to climate change will entail reconsidering our ways of life, organization, and projects across diverse horizons. A deeper understanding of how alternative differentially empowered domains are meaningfully structured both within and beyond political conflict helps to clarify the challenges and prospects of responding to climate change.

Scientists now widely predict that unabated, global climate change will have multiple, pervasive, disastrous consequences for the planet Earth’s biosphere and human society. Ulrich Beck (1995a: 82-84) compared climate change to a religious apocalypse. Others have dubbed it the “ecolypse,” or, emphasizing human agency, “ecocide.” One way or another, the present study shows, formulations of apocalyptic

crisis haunt alternative social constructions of global climate change. Such evocations raise fundamental issues, namely, where do we stand in relation to climate change and how are our actions oriented toward it?

Though “apocalypse” is often treated as “revelation,” it means “disclosure” in the ancient Greek. Specifically, the combination of *apo-* (“from”) and *kalyptein* (“concealment”) suggests an “uncovering,” presumably of something previously obscure or hidden. Disclosure is typically taken to have a divine source. However, for climate change, various social actors engage in (scientific, prophetic, and other) revelations based on their understandings of the future. It is thus important to consider the cultural structures of their disclosures and how they occur. We need to understand alternative cultural constructions of climate change, their logics of enacting the future, and the social strata and groups from which they spring.

Relative to ordinary times, the apocalyptic is inherently an interruption, a challenge to conventional understandings of time. People today are used to coordinating life within the enveloping *diachronic* web of clock and calendar, and this “objective” time seems “natural” to us. However, to understand climate change, it is necessary to deconstruct time. Notably, “the future” has undergone changes. In the high-modern era of the mid-twentieth century, when an ideology of progress prevailed, it was a frontier to be ordered under a rationalized diachronic regime of planning – in the terms of Michel Foucault (1988), to be subjected to “governmentality,” or the institutional regulation of individuals in relation to the totality of society and environment. Such “colonizing” of the future is still in play, and subject to myriad elaborations (Hall 2009: 127-29, 211-12). But recently, it has

come under pressure, in significant part because uncertainties challenge governmentality. High on the list is climate change. Dealing with it is not simply an environmental crisis, Beck asserted, it is a political crisis, and one for which necessary changes far outstrip present collective capacity to achieve them (U. Beck 1995a: e.g., 53, 93, 161; 1995b: chap. 1, 3). Responding to climate change eludes both straightforward, rational applications of scientific knowledge in the formulation and adoption of policies of threat reduction, mitigation, or adaptation, as well as institutional political mechanisms for resolving conflict over goals and strategies.

The scientific knowledge base is extensive and complex. Analyzing global climate involves a multi-paradigm and interdisciplinary aggregation of research agendas bridging a variety of environmental sciences, ecological and evolutionary biosciences, and various types of engineering, as well as history and the social sciences. Scholars in the latter fields have long recognized the complex relationships between climate, societal formations, and their cultures (Strauss and Orlove 2003; Behringer 2010), and geologists recently have designated the era of human-induced transformation of the planet as “the Anthropocene,” gradual in onset but clearly significant by the onset of the industrial revolution. However periodized, singling out the Anthropocene has as its premise that the interdependence of nature and society is the fundamental characteristic of a geologic era. Thus, a key sociological task concerns understanding the diverse cultural structures by which climate change and action in relation to it are construed.

Karl Mannheim has provided a point of departure for such inquiry in his pioneering studies of ideological and utopian worldviews (1936; 1971). Differences in social temporality, Mannheim argued, are key: “The innermost structure of the mentality of a group,” he wrote, “can never be as clearly grasped as when we attempt to understand its conception of time in the light of its hopes, yearnings, and purposes” (1936: 209). Mannheim recognized that mentalities do not exist as untethered, idealist worldviews, and subsequent research has identified ways that mentalities such as those he identified are instantiated in lifeworldly action and organization (Hall 1975). Following Mannheim, the present study takes as its key premise that the most direct way to identify and understand meaningful collective orientations toward climate change is to focus on their temporal constructions.

Integrating Mannheim’s interest in mentalities within a sociology of the lifeworld, I investigate alternative orientations to climate change by using a comparative structural phenomenology to examine alternative *registers* of temporally structured meaningful action – each with its distinctive correlate of social organization – and how they come into play in diverse, relatively autonomous social *domains*, when domains are understood as broad milieux of social interaction – either “social worlds” (Shibutani 1955) or relatively more institutionalized channels of action. Analysis of texts, I will show, can begin to identify how different domains are marked by cultural practices that operate through, span across, or hybridically combine various temporal registers of action. As it turns out, social actors in different domains construct global climate change in relation to temporal compositions of actions that they undertake or propose.

Climate change is a subject of myriad concerns. Around the world, there are multiple social domains where its reality, causes, and consequences are being experienced, debated, and addressed. The present analysis is not intended to offer an exhaustive delineation of all such domains.¹ Nor would the project of understanding cultural logics of climate change be well served simply by proposing a typological classification. Rather, I initiate a comparative phenomenological analysis by focusing on four domains in the West, primarily in the U.S., chosen because they are clearly and strongly oriented toward global climate change – (1) scientific research and policy analysis, (2) conservative skepticism and denial, (3) geopolitical security approaches, and (4) the environmental-movement milieu. These domains are hardly sealed off from one another. To the contrary, there are various connections among them. For example, climate-change skepticism, which is especially prominent in the U.S., yields arguments in relation to science and policy, but it does so in ways that are decidedly alien to that domain. On a different front, the domain of geopolitical security has a strong policy orientation, but it is distinctive in its concerns and analysis relative to the science/policy domain. As the present analysis will show, discourse in each of these and the other domains is ordered by sometimes coherent, sometimes hybridic and complexly articulated structurations of action in relation to alternative registers of temporality. The science/policy domain, for example, is largely structured by action and analyses centered in rationalized diachronic time of the clock and calendar, whereas the domain of climate-change doubt and skepticism invokes an “eternal” time of the planet Earth and the geopolitical-security domain is centrally oriented in strategic

time – a structuration that, when accentuated by a sense of crisis, begins to approximate the apocalyptic time that is the foundational backdrop of action in environmental movements. Analysis of these constructions brings into view the cultural structures of meaning within domains as well as disjunctures, aporias, and points of contention and rapprochement across domains.

In significant ways, the diversity of responses to issues of global climate change and its intractability as a collective social problem have their bases in radically alternative orientations and interests concerning climate change within the domains wherein organized action unfolds. Mapping the cultural structures of these domains can help open up the social and political space for public discourse that transcends received frameworks. As a general theoretical framework used in this way, structural phenomenology thus can both advance substantive sociological analysis and promote a goal advanced by Andreas Glaeser (2014) – facilitating consideration of alternative future institutional arrangements of contemporary societies.

In what follows, I first review relevant social-science research on climate change, especially research concerning its alternative discursive constructions. I then locate structural phenomenology theoretically as an approach to institutional analysis. On these bases, I analyze the four selected domains oriented toward climate change – institutionalized scientific research and policy analysis, conservative skepticism and denial, geopolitical security, and environmental movements. A concluding coda considers the implications of the analysis both for

sociological theorization of institutions and for future social responses to climate change.

Global climate change and its cultural aporias

There is an overwhelming consensus among relevant scientists about the reality of global climate change and substantial agreement about anthropogenic contributions to global warming (Farnsworth and Lichter 2012; Clark 2014). However, cultural understandings and practices are intimately embedded in “nature,” and climate change cannot simply be reduced to questions of science, politics, or power (Hulme 2009). Social scientists thus have analyzed diverse social aspects of climate change, as well as developing proposals for responding to it (for an overview, see Giddens 2011). A number of them argue that adequate response to environmental problems requires nothing less than dramatic social change. Already, two decades ago Ulrich Beck (1995a) proposed a fundamental reorganization of relations between technocracy, democracy, and citizenship. Concerning climate change specifically, Richard York (2010) asserts that because increased efficiency is unlikely to reduce CO₂ emissions in the face of continued population increase, the core ideological assumption of modernity – growth – has to be altered. Sharing that viewpoint, John Urry has called on sociologists to take a lead in promoting social and economic reconstruction oriented toward “changing whole *systems* of economic, technological and social practice” (2010, ital. in orig.). In short, certain social scientific engagements depict global climate change as raising basic challenges for the existing global order, the resolution of which will require fundamental social change around the world.

Yet both scientific and social-scientific analyses that point to the urgent need for dramatic action run head on into disjunctures between science, policy, politics,

and popular opinion. Significant numbers of people are not convinced that climate change is happening, and even those who accept the reality of climate change draw quite different conclusions about what kind of social challenge it represents. Despite political engagement in arenas ranging from local communities to nation-states and international governance organizations, effective actions to stabilize the level of CO₂ and deal with the consequences of climate change remain elusive. Like Ulrich Beck, Clark (2014: 22) holds that the sheer enormity of the challenge transcends social capacity to confront it: “There is, setting out from this predicament, no clear-cut or obvious passage from the countenance of planetary disaster to a novel sense of geo-politics.” Even were such a geo-politics to develop, he suggests, it would involve novel global science and engineering that experimented with the Earth itself, yielding the potential for unintended consequences on a global scale. A different line of analysis, of democratic politics (Jenkins 2011) details the political challenges that Beck anticipated. Focusing on the U.S., Jenkins holds that advocates of legislation intended to deal with global climate change would need to succeed in multiple arenas – the media, public awareness, the electoral process, and governmental policy. Success has been constrained by four factors – the conservative campaign to advance skepticism concerning climate change, media norms of “balance,” an initially low sense of public urgency, and the limited salience of climate change in electoral politics, compared to other issues.

Even in policy studies, the question of what to do is contentious. As Hausknast (2014) argues, among alternative kinds of collective action, the easiest of them – “rational” policy solutions and “market” choices – are either the most elusive

or least effective, whereas the actions likely to be most effective are “decisions” that “force one to choose a position among diverse political rationalities or worldviews.” Because dealing with climate change requires decisions – the most difficult routes for collective action – Hausknast concludes that environmental politics in liberal democracies presently proceeds (or more accurately, does not proceed) under conditions of “agentic deadlock.”

Given the fraught politics, considerable research has been directed to analyzing different orientations toward climate change, their sources, and the possible bases on which they might change (Whitmarsh, O’Neill, and Lorenzoni 2011). Yet from a standpoint of social critique, such research is embedded within technocratic frameworks that are part of a dual problem. On the one hand, under “post-political” and “post-democratic” circumstances, the proposals of technocrats are privileged over any democratic process. On the other hand, a relentless populist apocalyptic discourse jades public opinion and places action on global climate change beyond political engagement (Swyngedouw 2010; Bettini 2013).

How, then, does the general public understand climate change, and why? Findings are mixed. In one study of the U.S., Purdy (2010) argues that democratic processes historically have been driven by emergent reconstructions of the meaning of nature and these reconstructions have driven significant legislative action. Other studies, however, identify obstacles to popular cultural mobilization. Studying climate opinion ethnographically in a Norwegian community, Norgaard (2011) shows that denial is not simply a political product of mass-mediated propaganda: even educated people relatively unencumbered with ideology participate in socially

organized processes of denial based in their collective experiences and sense-making procedures. Substantial sources of apathy and denial are apolitical rather than political. And even when climate change is accepted as a reality, a Swedish study shows that addressing it can become a post-political matter, often experienced personally through “‘neurotic’ micro-political action” such as recycling (Berglez and Olausson 2014).

Probing the structures and degree of popular engagement with climate change is important, but such research does not directly address the “agentic deadlock” theorized by Hausknast. To do so requires exploring divergent *institutional* approaches to global climate change. This issue is beginning to be considered in research based in field, framing, and discourse analysis. Some studies are focused on a single arena or field. Corry (2012), for instance, examines the cultural construction of geo-political security, zeroing in on speech-acts in order to consider whether, because of the increasing significance of environmental issues, the conventional orientation – “securitization” – has been supplanted by “riskification,” the logic of which requires shifting from identifying proximate threats to a different approach, dealing with problems through governmentality. Other research maps alternative orientations, primarily in relation to political contention. Levy and Spicer (2013) identify four “climate imaginaries” or “shared socio-semiotic systems” about how to deal with climate change – “fossil fuels forever,” “climate apocalypse,” “technomarket,” and “sustainable lifestyles” – and they chart how these imaginaries come into play in a series of political struggles.

Other studies employ social-movement framing theory. For example, Hoffman (2011) uses frame analysis to show that two institutional logics about climate change – “convinced” and “skeptical” – are “talking past each other” in that they address altogether different questions – how to define a problem versus how to solve a problem already defined. On a different front, Juhola, Keskitalo, and Westerhoff (2011) use the environmental framing analysis process developed by Miller (2000) to examine alternative ways in which policy analysts in selected European countries, across different levels of governance, construct “adaptation” to climate change as an issue – by dealing with “vulnerability” or “economic risk,” engaging in “planning,” or continuation of “existing measures.” Another study (Vezirgiannidou 2013) analyzes divergent orientations as matters of rhetorical political framing, by looking at how the Obama administration in the U.S. has created linkages between climate change and other issues such as energy security and economic growth. The constructed linkages, Vezirgiannidou argues, undermine the potency of climate change *per se* as an issue.

An alternative to field and framing analyses involves discourse analysis. Political scientist John Dryzek’s *The Politics of the Earth*, now in its third edition (2013), uses a formal two-dimensional typology (Reformist versus Radical, and Prosaic versus Imaginative) to yield a theoretical classification of four divergent environmental discourses – Limits and Survival, Problem Solving, Sustainability, and Green Radicalism. He elaborates these categories by using a variety of empirical materials to produce composite descriptions.

Whether they use field, framing, or discourse analysis, the studies of alternative orientations considered so far suggest that climate-change concerns are meaningfully structured in alternative ways both because of conflict over policy alternatives and because political actors have conflicting political goals. These studies all conceptualize differently located social actors oriented to *political* contention. However, as Wittneben et al. (2012) have observed, multiple kinds of actors and organizations confronting climate change have divergent strategies, capacities of power, and orientations in relation to wider structures of political economy. The global character of climate change has led many different organizations, groups, communities, and kinds of individuals to respond in altogether different ways. Orientations to climate change thus are not necessarily reducible to policy differences or political contention. However, to date, only one researcher has sought to consider cultural orientations to climate change on a wide basis. Building on Dryzek's discursive approach, Mike Hulme (2008) details three tropes by which climate historically has been envisioned – a pre-modern sense of climate as judgment, a modern understanding of climate as pathology, and a post-modern orientation that problematizes climate as catastrophe. In the end, Hulme (2008: 13) emphasizes that resolutions to the contemporary crisis of climate change will be as much cultural as technical:

As the naturalistic causal turn of the nineteenth century dissolved the fear of climate rooted in unknown causes and the technology and hyper-mobility of the twentieth century weakened and defused the fear of unknown climatic

spaces, so we will find new cultural movements and new hierarchies of power changing the discourse of fear about unknown climatic futures. In a subsequent book, Hulme holds that climate change is ultimately not most usefully understood as a problem to be solved, but rather as an occasioned basis to “rethink how we take forward our political, social, economic, and personal projects over the decades to come” (2009: 362). In this light, divergent orientations to climate change are not simply matters of contention to be resolved in struggles within the field of politics, any more than they are just matters of disagreement within multiple and overlapping fields of science. For the purposes of understanding alternative social orientations to climate change, it is important not to assume that they share “climate change” as a common object of understanding, investigation, contention, or action.

Structural phenomenology: action registers, fields, domains

Forgoing any such assumption, the present study uses hermeneutic (or interpretive) analysis based in structural phenomenology (Hall 2009, 2014) to identify orientations toward climate change in different social domains – broad milieu of social interaction marked by distinctive cultural logics that entail, in Schutz and Luckmann’s (1973: 23-25) terms, “finite provinces of meaning.” I examine such domains in terms of their cultural logics, social and political bases, and articulations and disjunctures with one another. This approach builds upon field theory in an orthogonal way that theorizes what Eyal (2013) has termed “spaces between fields.”

It yields a description of four major domains in which climate-change organizations and actors operate.

The study follows the interpretive methodology that Max Weber employed in substantive analysis – iconically, in *The Protestant Ethic and the Spirit of Capitalism* (1958). As Biernacki (2012, 2014) argues, such a methodology, oriented as it is to meaningful analysis of “symptomatic exemplars,” cannot properly be concerned with generalization about any broader population. Thus, I subject texts to hermeneutic analysis not on the basis of their supposed representation of a broader universe, but because they throw into relief alternative problematics that emerge in relation to climate change within different key domains. In the interpretive analysis of these domains, as Richard Zaner put it, I seek to “*make explicit what is only implicit and taken for granted within the social world*” (1974: 391 [ital. in original]). Following Karl Mannheim, I focus on various kinds meaningful temporal constructions that are evidenced in the texts – in ways the texts are produced, in activities that they report, in ways of framing proposed actions, and so forth. The analysis is oriented toward identifying cultural structures of meaning by examining resonances and alignments between narrative, plot, and temporality (Ricoeur 1984, e.g., xi, 53, 71). Because the main texts considered were all produced within a relatively bounded period of five years, from 2009 to 2014, their analysis provides a set of benchmarks concerning the structuration of domains at a particular juncture in the emergence of concerns about climate change.

Structural phenomenology offers a novel theoretical approach to sociological analysis of climate change, first, because by identifying temporal structurations of

meaningful action, it changes the focus from discourse as idealist abstraction to practice in the world, and second, because it shifts from Schutz and Luckmann's (1973) description of "essential" or general structures of the lifeworld to comparative analysis. In the present study, various *domains* are structurally specified in relation to *registers* of action, interaction, and social organization. The approach involves two basic precepts: ontologically, that social action is fundamentally *temporal* in its meaningful character, and methodologically, that *ideal types* can be used to identify alternative relatively coherent registers of temporally structured action.

On the first point, as philosopher Jean-François Lyotard (1991: 113) held, "we must not say time flows *in* consciousness – it is, on the contrary, consciousness which, on the basis of its now, deploys or constitutes time." In other words, the here-and-now is not simply a uniformly experienced moment of the vivid present.² Rather, we inflect the here-and-now with radically different temporalities of action when we participate in ritual, make love, play the stock market, or work on an assembly line. Existentially, in the course of everyday life we readily shift what Schutz and Luckmann (1973: 22-25) called the "accent of reality" from one temporal horizon to another. We are all *bricoleurs*, living in multiple realities, moving every day across a variety of worlds previously constructed as *bricolages*. People can only live in the here-and-now, but the ways that they do so construct futures (Tavory and Eliasoph 2013), including in relation to climate change (Mische 2014). Thus, pursuing one component of the phenomenological approach to climate change proposed by Brace and Geoghegan (2011), the present study considers the ways in

which people, in concert with one another, act in meaningful time to construct futures.

Concerning the second point, structurally, alternative registers conceptualized as ideal types identify how action and interaction are conventionally or institutionally organized in alternative constructions of temporality (see figure 1). Ideal types are meaningfully coherent theoretical models that offer analytically useful models for deconstructing the (often diverse and less than fully formed) meaningful logics at play in empirical social phenomena. The present analysis references six ideal-typical temporal registers of action beyond the *here-and-now* – that existential point of *embodiment* in which we all lead our lives. *Diachronic time*, or clock and calendar time, uses rational and objective unit durations – seconds, hours, days, weeks, and so on – to provide a constructed framework for scheduling and coordinating social action and commodifying activities, most notably, labor. *Collective synchronic time* ritually organizes “sacred” meanings designed to guide action, constructing the here-and-now as a moment of communal solidarity. *Strategic time* orients people acting in the here-and-now to try to influence contingent outcomes in competition or conflict and thus advance their goals, as in the stock market, elections, and war. Pushed to an extreme, when strategic action is oriented to “the End,” it becomes *pre-apocalyptic*, that is, time coming to an end, anticipating a dramatic shift, the Apocalypse. Finally, “timeless” *eternity* can be approached through community-based tradition that seeks a “return” to a “golden age” or, from a different direction, as *post-apocalyptic* temporality strongly inflected

with utopian meanings centered on constructing a tableau of the social in a New Era (Hall 2009: 9-11).

As figure 1 shows, each of these types is associated with a distinctive pattern of social organization. Each type thus has specific potentials for action as well as possibilities and limitations concerning the form and exercise of power. For example, collective synchronic time is the here-and-now of the assembled community, consolidated – as Emile Durkheim emphasized – by ritual producing effervescence. Its form of power is that of producing solidarity in relation to shared meanings, which can, in turn, be directed strategically. By contrast, action in diachronic time – time measured in replicable and transposable objective units and treated as a “thing” – is the central basis of rationalized formal organization, as described by Max Weber; its power is that of administration and governmentality. These and the other ideal types can be used to identify component action elements of empirical social phenomena, which are usually hybridic compositions.

<Figure 1 about here>

In recent years, analysis of patterned social organization has been pursued most often through the use of field theory, via the work of Pierre Bourdieu (e.g., 1996a, 1996b) and others, notably Fligstein and McAdam (2012), who offer a review of various strands and connections. Bourdieu’s approach to the analysis of the literary field, the economic field, science as a field, and others has been applied

extensively, to topics as diverse as think tanks (Medvetz 2012), behavior genetics (Panofsky 2014), and sex (Green 2014) but, to date, not climate change.

Bourdieu recognized differences, e.g., between the political and state fields, each with its own “stakes” of success and kind of “capital” through the accumulation of which actors strive to gain position. Beyond circumscribed fields, he posited the general field of power as the “arena where holders of the various kinds of capital [i.e., distinctive to different fields] compete over which of them will prevail” (Wacquant 1996: xi; Bourdieu 1996a: 265).

Despite the strength of this theoretical framework, as Fligstein and McAdam (2012) observe, beyond identifying power as a general field transcending and drawing together other fields, Bourdieu did not theorize either relations among fields or the connections of fields with wider social realms and processes. Eyal (2013) thus raises the question of whether all social phenomena can adequately be theorized as fields, and if not, how to begin to think about the “spaces between fields.” Medvetz (2012) has undertaken analysis along such lines by exploring the position of think tanks in relation to multiple fields. And Fligstein and McAdam themselves have described fields and interfield relationships in diverse social arenas, for example, complex state formations and social movements. However, their program, like Bourdieu’s, is oriented to theorizing fields in strategic terms (indeed, they use the term “strategic action field” as their core concept, though they acknowledge the possibility of more “cooperative” fields). Nor are Bourdieu or Fligstein and McAdam centrally concerned with what Friedland (2009) calls the “cultural specificity” of fields. Overall, their analytic interests center more on the

general dynamics of strategic contestation within fields than on either their meaningful cultural frameworks or their relationships to one another and to broader social formations.

The present study builds out from field theory in an approach orthogonal to it, by positing that not all social processes are adequately theorized as field processes and using structural phenomenology to identify alternative cultural constructions of social processes in key social domains concerned with climate change. My concern is not, as in field theory, to identify the structures of fields under an assumption that all fields involve basically equivalent struggles for power pursued in relation to field-specific stakes and strategems. Instead, structural phenomenology theorizes alternative cultural logics and kinds of power exercised in different temporally structured registers of action and organization. On this basis, in the present study, it is possible to identify relationships between various fields and more encompassing domains centrally concerned with climate change. This analysis lays bare structurations of the social at a scale wider than fields *per se*. Domains may depend upon and facilitate interaction across relatively autonomous fields, for example, insofar as those fields share a particular temporal organization of action (as science and policy fields often do) or when such fields, despite their different stakes, share interests in relation to climate change (as with certain political actors and conservative Christianity in the U.S.). Structural phenomenology thus offers the possibility of mapping a broader social formation where differently constituted and unevenly linked social domains connect and divide a multitude of individuals and

groups acting in alternative ways in relation to climate change. It is to the analysis of four domains central to this social formation that I now turn.

The science/policy order constructs global climate change

For the prevailing strong scientific conclusions to have been reached about climate change, two interconnected historical developments were required. First, “climate science” had to become an *enterprise*. Second, and collaterally, climate scientists had to construct a basis on which to discern “global climate change” as an *object* of investigation. These developments, I submit, yielded a domain that has come to span science and policy as distinct fields, each with its particular stakes. Just as Ulrich Beck (1995a: e.g., 55) argues concerning environmental hazards, climate science increasingly and necessarily confronts issues that go beyond science because they entail policy decisions about risk. In temporal terms, both climate-change science and climate-change policy (1) centrally *operate* on the basis of diachronic (or clock and calendar) time, and (2) *deploy* such a construction of time as the basis on which to model global climate change. This circumstance is a product of the core cultural logics of both science and policy analysis and, for climate issues, their emergent elective affinity. The convergent domain development can be traced by beginning with the emergence of climate science as a field and then briefly exploring its articulation with policy in a broader domain.

Climate science emerged in the first half of the twentieth century out of a relatively inchoate amalgamation of weather forecasting and meteorology, combined with policy interests in controlling weather – developments that by the

1950s consolidated the field of inquiry (Baker 2014). What, then, of its analytic object? As Paul Edwards (2010) emphasizes, global climate is not directly available as a natural empirical phenomenon. Like many topics of interest to scientists, it is brought into analysis by measurement. Global climate, as construed by climate scientists, comprises a complex of differentially connected processes that becomes accessible through collection of diverse research data on climate, integrated via various modeling techniques, including simulation.

What are the temporal constructions embodied in climate science, and how do its models make sense of the future? These questions can be addressed illustratively, and for a specific historical moment, by examining temporal formulations of climate-change processes in the 1552-page scientific report entitled *Climate Change 2013: The Physical Science Basis*, one of a series of comprehensive meta-analyses of previous research produced by the Intergovernmental Panel on Climate Change (2013), or IPCC. This entity – jointly established in 1988 by the World Meteorological Organization and the United Nations Environmental Programme – is the most widely known and authoritative single organization pursuing the scientific analysis of climate change (Giddens 2011; Stehr and Grundmann 2012). The very scope of the project suggests that the IPCC increasingly promoted the science/policy domain's transcendence of relatively autonomous fields of climate science and climate-change policy, for it is a translational enterprise monitored by governments that summarizes, synthesizes, and to some extent seeks to adjudicate diverse findings of scientific research in a way that positions knowledge in relation to policy analysis and state action (Hirst 2014).

The temporal structures of the 2013 IPCC report's discourse are striking. At the outset, the preface (2013: viii) emphasizes that the *production* of the report is based on a rationalized policy deployed in order to yield consistent writing practices across the time and space of differently located authors. The text, in other words, is produced by procedures of rationalization that parallel those of diachronic time. The IPCC report is a product of bureaucratically specified action meant to be consistent across time.³

Moreover, the report is the outcome of activities programmed, scheduled, and coordinated in calendar time. Thus, it is part of an ongoing, bureaucratically organized practice oriented to the accumulation of knowledge. It invokes a basic trope of science as a practice located in diachronic time, namely, "*progress* in climate change science since [a previous report, issued] in 1990" (IPCC 2013: vii [emph. added], 15). And the release of its findings is keyed to anticipated future bureaucratically scheduled events: "The timing is particularly significant, as this [climate] information provides a new impetus ... to those negotiators responsible for concluding a new agreement under the United Nations Framework Convention on Climate Change in 2015" (IPCC 2013: v). That is, IPCC science activities are coordinated via a diachronic calendar with an administrative schedule for global policy action to deal with climate change.

The report's analyses are equally diachronic in their temporality, in diverse constructions. Just as the report's structure and orientation are oriented in diachronic time, its analyses involve the mapping of events in standardized units of objective time in order to provide "evidence of past, present, and projected future

climate change.” Within this broad diachronic framework, scientific research does not deal with temporality on a single scale of units. Rather, as the report notes, “Timescales from days to decades ... and from centuries to many millennia ... are considered” (IPCC 2013: vii).

Whereas the bureaucratic diachrony of report production is concerned with commoditizing time in order to coordinate events and actions, the science in the report is concerned with charting variables over past time and projecting alternative future scenarios and “irreversible trends and surprises” (IPCC 2013: viii). The report maintains a basically *symmetric* circumspection about the past and the future unless a point seems to be an unqualified matter of fact (IPCC 2013: 4). Some statements about change over time do not require any qualification: For the past:

- “Total radiative forcing is positive, and has led to an uptake of energy by the climate system. The largest contribution to total radiative forcing is caused by the increase in the atmospheric concentration of CO₂ since 1750” (IPCC 2013: 13).

However, in most cases, a “degree of certainty” about reality is expressed as “a qualitative level of confidence” (IPCC 2013: 4) transposed from quantitative probabilities in relation to the amount of evidence and amount of agreement across studies (IPCC 2013: 36). For example, about the past, the report asserts,

- “It is *virtually certain* that globally the troposphere has warmed since the mid-20th century” (IPCC 2013: 5, orig. emph.)
- “average rate of ice loss from the Greenland ice sheet has *very likely* substantially increased from 34 [–6 to 74] Gt yr^{–1} over the period 1992 to

2001 to 215 [157 to 274] Gt yr⁻¹ over the period 2002 to 2011.” (IPCC 2013: 9, orig. emph.);

- Concentrations of CO₂, CH₄, and N₂O now substantially exceed the highest concentrations recorded in ice cores during the past 800,000 years. The mean rates of increase in atmospheric concentrations over the past century are, *with very high confidence*, unprecedented in the last 22,000 years (IPCC 2013: 11, orig. emph.).

And, for the future:

- Relative to the average from year 1850 to 1900, global surface temperature change by the end of the 21st century is projected to *likely* exceed 1.5°C for RCP4.5, RCP6.0 and RCP8.5 (*high confidence*). Warming is *likely* to exceed 2°C for RCP6.0 and RCP8.5 (*high confidence*), *more likely than not* to exceed 2°C for RCP4.5 (*high confidence*), but *unlikely* to exceed 2°C for RCP2.6 (*medium confidence*). Warming is *unlikely* to exceed 4°C for RCP2.6, RCP4.5 and RCP6.0 (*high confidence*) and is *about as likely as not* to exceed 4°C for RCP8.5 (*medium confidence*)” (IPCC 2013: 20, orig. emph.).

Thus, the report, set in diachronic time, treats knowledge about the future in the same probabilistic terms as the past, equally offering statements of degree of confidence about both. Moreover, as figure 2 shows, the report recognizes that variable aspects of any given phenomenon (e.g., the temperature of the Pacific Ocean at 0°23'36.7"N 177°05'45.3"W, 3 meters below the average surface) fluctuates from second to second, hour to hour, day to day, and so on. Because fluctuations in variable values over time affect statistical calculations, the report

addresses the degree to which averaging data across units of time improves prediction.

<Figure 2 about here>

Diachronic time more widely is hardly fixed in its character. It is not a natural kind and thus it is subject to multiple and ever emergent constructions and elaborations, for example, in relation to technologies such as smart phones and internet calendars. For climate science, the refinement and integration of time measurements have been central to construction of its object of analysis (Edwards 2010: 40-47). In the IPCC report, diachronic time charts global variations and trends on a linear temporal grid. The report elaborates this practice in two important ways. First, “natural and anthropogenic substances and processes” are treated as “drivers” of climate change yielding developments of “radiative forcing” that differ from simple linear trends charted over diachronic time – either directly or, additionally, through positive or negative feedback loops (e.g., IPCC 2013: 68). Second, despite the basic symmetry between treatments of past and future, the report faces a central problem about the future, compared to the past. Whereas its assertions about the past require statements about likelihood of accuracy of measurement and modeling, statements about the future are predictions about events that have not yet occurred. The report therefore devotes considerable attention to identifying the diachronic temporal conditions under which predictions have been more or less successful in the past and how such predictions have improved during the last half-

century. In other words, the IPCC report maps the accuracy of both past and present predictions about the future in relation to diachronic units of time (IPCC 2013: e.g., 961, figure box 11.1, figure 4; 972, figure 11.3). For data about future trends, the report employs “projections” – based on applying historical simulations of past processes to the future events. As figure 3 shows, projections about the future vary more widely than projections (retrojections?) about the past, due to lower confidence about the likelihood of future scenario conditions, including anthropogenic ones.

<Figure 3 about here>

Given the overwhelmingly diachronic treatment of global climate change in the IPCC report, does climate science ever construct climate change in a different temporal register? Increasingly since 2005, some scientists have embarked on a research program on “tipping points” – points in diachronic time when a system is projected to irreversibly shift into a new configuration, like a glass pushed ever closer to the edge of a table that suddenly falls and breaks (Russil and Nyssa 2009). Such analyses, reviewed by the National Research Council (2013), have been advanced both for discrete components of global climate, such as “Sahara greening” and “dieback of Amazonian rainforest” (Lenton et al. 2008) and for the global climate system as a whole (Dakos et al. 2008; Barnosky et al. 2012; Mora et al. 2013). These analyses employ careful diachronic analysis in order to develop methodologies and project specific times or intervals when dramatic or irreversible

changes are expected or already begun, for example, in the collapse of the West Antarctic Ice Sheet. However, formulations may be carefully qualified in how they locate such shifts in diachronic time. One study's authors comment, "Although a tipping point may be crossed in an instant, large-scale climate systems that include ice sheets or deep ocean circulation may have substantial inertia, such that the full response may play out dynamically over an extended period of time, constituting a 'tipping interval'" (Praetorius and Mix 2014). And the National Research Council report, *Abrupt Impacts of Climate Change: Anticipating Surprises*, scrupulously avoids setting any dates in diachronic time. Instead, it shifts the tipping-point problem into a strategic temporal formulation about how "careful and vigilant monitoring" can help "anticipate major changes before they occur," just as an explorer in a canoe would want to anticipate the Niagara Falls by the roar of falling water before it was too late to get to shore. As the report argues, "The time is here to be serious about the threat of tipping points so as to better anticipate and prepare ourselves for the inevitable surprises (National Research Council 2013: viii, 13). This language bears obvious affinities to non-scientific prophecy about a decisive event that produces "the end of the world as we know it" – in the case at hand, a future environmental apocalypse. Thus, insofar as scientists anticipate future dramatic shifts as through prediction of specific events of crisis, they end up confronting challenges of unfulfilled predictions similar to those that ecological prophets of apocalypse face (discussed below).

In contrast, truer to the diachronic construction of temporality in relation to rationalized methods of prediction, simulation, and projection, the IPCC report

avoids identifying any single point of no return. Instead, alternative climate policy scenarios yield projections about climate over time in the twenty-first century and beyond. The alternatives are based on different levels of radiative forcing designated as “Representative Concentration Pathways” (RCPs). These RCPs take into account a wide variety of greenhouse, aerosol, and chemically active gases, plus land use and land-cover projections. Overall, the report identifies one RCP (2.6) in which public policies of mitigation are actively pursued and radiative forcing peaks before the year 2100 and then declines, two intermediate RCP scenarios in which radiative forcing is “stabilized” after 2100, and a fourth sort of “worst case” scenario in which radiative forcing continues to rise after the year 2100 (IPCC 2013: 1101, 1461). In short, as figure 4 shows, solidly within a diachronic construction of temporality, the IPCC report charts the future as a series of alternative scenarios keyed to intervention alternatives. Different policies are depicted as bending the curve of future time one way or another, with various consequences. Here, the legitimacy of scientific authority is maintained by avoiding framing projections in the strategic temporality of highly political policy intervention.

<Figure 4 about here>

Congruent with modern institutional developments of diachronic temporality more widely, the IPCC report locates climate phenomena on various scales based in an overall grid of objective temporality. This grid, when centered on the future, bears a direct affinity with policy and planning time, and thus, with the

power exercised through administration and governmentality. In effect, science and policymakers proceed via a division of labor. Science depicts circumstances in which policy entities and state organizations operating in a diachronic mode either colonize the future through mitigation and adaptation or the world is subjected to alternative scenarios based on non-intervention. Policy-makers develop plans and programs based on consideration of such scenarios. Although there is a longstanding and conventional boundary between science and policy, what are generally treated as two distinct fields thus share the cultural logic of a domain centered in diachronic time. Policy analysis, like science, is a rationalized enterprise and its temporal calculus is concerned with planning charted on the basis of objective temporality (e.g., given population projections, how much sewage capacity will be required in a given system in the year 2065?).

Although scientists typically hold back from acting as “knowledge brokers” under conditions of scientific uncertainty (Knaggard 2014), there is contention concerning how scientists should position their work in relation to policy issues that lie beyond the field of climate science as a field. Some scientists have adjusted their rhetoric in order to communicate more effectively with policy and political actors (Besel 2013). Thus, the conventional boundary between science and policy as fields – given their shared domain centered in diachronic temporality, never particularly sharp – has become increasingly blurred under circumstances of urgency that have emerged on the basis of climate-science analysis (van der Sluijs 2012; Mahony 2013).

There have been two broad developments. On the one side, many climate scientists are frustrated by the gap between the overwhelming scientific consensus and lagging public perceptions and political action, and this frustration has yielded stronger policy advocacy, in part based on an emergent position of “ecological ethical reasoning” that advances science as a basis for governmentality (Skoglund and Jensen 2013). As Stehr and Grundmann (2012: 35) observe, the IPCC reports now routinely include “Summaries for Policymakers” that move beyond purely objective scientific discourse. Nor is the IPCC alone in entering the policy fray. A recent report by the American Association for the Advancement of Science all but crosses over into advocacy by asserting that “responding now will lower the risk and cost of taking action” (AAAS Climate Change Panel 2014). On the other side, policy actors have become more engaged with how to proceed under conditions of less than absolutely certain scientific knowledge (Knagaard 2014). Yet as Ulrich Beck (1995a) argued, uncertainty erodes the boundaries of rationality, and policy thus opens out onto the field of politics. There, insofar as policy actors adopt a broadly progressive ideology, they engage in efforts in *strategic* time to exercise power in ways that will bring consequences charted along the diachronic scenarios of the future charted by science.⁴ However, as Stehr and Grundmann (2012: 38) assert, “The grand global targets and timetable architecture that have provided the link between the IPCC and the international negotiation process has proven ineffective.” In other words, diachronic science and policy do not articulate well with the strategic temporality of politics.

The broadly diachronic construction of climate change in the science/policy domain offers a benchmark for considering alternative constructions of the future. In temporal terms, it is relatively coherent, and largely of a piece with other constructions of the wider domain that increasingly encompasses fields of science, technology, and the state (Jasanoff 2004). However, the science/policy temporal framing is vulnerable to contestations of legitimacy. As practitioners readily acknowledge, science cannot assert a claim to absolute knowledge of the future (or the past) because its constructions are theories, scenarios, predictions, and projections based on measurements of selected aspects of phenomena (cf. Husserl 1970). The IPCC report is a good example showing how scientific statements about both the past and future are framed in degrees of confidence. In part because science rarely traffics in absolute truth, when it addresses controversial issues such as climate change, any purely rationalized translation of scientific knowledge into policy initiatives becomes subject to considerations about norms, values, and goals that open out to the play of politics. Climate science is thus subject to external scrutiny – all the more so, as risk has become an increasing consideration (U. Beck 1995a: 93) and when knowledge claims are revised or bias is asserted (S. Beck 2012; O'Reilly, Oreskes, and Oppenheimer 2012; Leiserowitz et al. 2013). There is a certain revenge of the postmodern. Science no longer is accorded the unquestioned legitimacy it once received. Challenges to climate science yield a perverse result: cautious scientists *underestimate* the disruptive threat that climate change poses (Freudenberg and Muselli 2013).

Conservative politics and the eternity of nature

Given the tenuous status of controversial scientific knowledge, a key issue concerns whether and how technocratic policy actors, elites, and mass media “contain” issues within a rationalized diachronic domain (Asayama and Ishii 2014; Knagaard 2014; Mahony 2014). Especially but not exclusively in the U.S., scientific/policy framings of the global climate future have been subjected to skepticism, doubt, and outright denial, largely arising from the relatively autonomous domain of conservative politics, amplified both by conservative media and by the institutional norms of mass media more generally (Boykoff 2013; Elsasser and Dunlop 2013). Unlike the relatively *coherent* science/policy framing of the future, the domain of conservative denial and skepticism is complexly hybridic in its constructions of the future, in large part because it spans disparate fields with different agendas and ideologies. Thus, “denialism” must be deconstructed in order to discern its multiple sources and components (cf. Fisher, Waggle, and Leifeld 2013: 88).

First, there is a raw power politics of skepticism and denial centered in a strategic temporal orientation to achieving political goals. As Antonio and Brulle (2011) show, neoliberalism – the latest incarnation of “market liberalism” – evidences a general anti-environmentalism that is intensified by recognition of the changes that serious efforts to deal with climate change would entail. Business enterprises facing climate-policy interventions (for example, coal, oil, and gas companies) have a narrow self-interest in constructing the future in ways that maximize profits, and with billions of dollars of profits at stake, they are willing to expend considerable financial and organizational resources on multiple fronts in

order to block efforts to deal with climate change.⁵ This *strategic* temporal orientation shapes a relationship to the science/policy construction of the future, encouraging political actors and conservative mass media to deny or raise doubts about scientific predictions that drive environmental policy shifts affecting their business interests. As a consequence, public opinion about the reality of climate change is highly skewed (McCright and Dunlap 2011, 2013)

The political interests of some corporations in denial are on full display in hearings before the U.S. Congress; frequently, however, opponents have focused on the immediate economic consequences, rather than debating the reality of climate change (Fisher, Waggle, and Leifeld 2013). Thus, Marco Rubio, a 2016 U.S. presidential candidate, tied skepticism directly to economic interests: “I do not believe that the laws that they propose we pass will do anything..., except it will destroy our economy” (NYT 5/11/2014).

As the Italian sociologist Vilfredo Pareto (1966) theorized early in the twentieth century, the body politic is not always moved by rational argument, even less by assertions of brute interests. Rather, Pareto argued, political discourse can more easily motivate individuals by deployment of superficially persuasive “derivations” that appeal to deep-seated, unconscious, and irrational “residues” such as the integrity of the individual or the honor of the group. Similarly, C. Wright Mills (1940) noted the tension between “situated actions” by which people pursue their interests and the “vocabularies of motive” by which they frame supposed intentions behind actions. Beyond narrow self-interest centered in a strategic temporal

register, what, then, are the constructions of the future through which climate-change doubt, skepticism, and denial are framed?

To begin, climate science is an ongoing endeavor. Under these circumstances, a small number of scientists – few of them specifically climate scientists and some of them directly connected to conservative policy circles – frame skepticism in the diachronic terms of climate science, but assert either that the projections and predictions of the IPCC and others about future trends are mistaken or that social capacity to deal with changes makes their significance moot (for an account of an early intervention taking the latter tack, see Oreskes, Conway, and Shindell 2008; on the cultural sources of certain scientists' opposition, see Lefsrud and Meyer 2012; Lahsen 2013). A similarly rationalist approach is taken by conservative think-tank policy analysts, for example, from the Competitive Enterprise Institute, who formulate arguments about risks, costs, and benefits of alternative policy interventions (Dunlop 2013). Such actors seem to embrace the legitimacy of science and policy, and they use the diachronic framings of science and policy to question data, inferences, and conclusions. Skepticism about the science is then taken to warrant rejection of policy proposals.⁶

An important case in point is the Nongovernmental International Panel on Climate Change (NIPCC). It receives funding from the conservative Heartland Institute.⁷ Nevertheless, as an NIPCC report edited by Idso, Carter, and Singer affirms, it “seeks to objectively analyze and interpret data and facts without conforming to any specific agenda” (2013: v). The report mirrors the diachronic temporality that frames the IPCC report on physical science, specifically

acknowledging that “Understanding climate change involves research in many branches of science across a multitude of spatial and temporal scales” (Idso, Carter, and Singer 2013: x). Operating as a self-described “red team” (i.e., a group of scientists seeking out negative evidence), the NIPCC report challenges assertion after assertion of IPCC reports, for example, asserting that “Air temperature variability decreases as mean air temperature rises, on all time scales” (5), and offering charts such as figure 5, which depicts variation in mean Earth temperature over a 2,000 year period that would be uncorrelated with recent increases of CO₂ in the atmosphere. The NIPCC report also advances considerable skepticism about the value of predictions based on dynamic modeling, in part because of the interaction of physical with chemical and biological processes and their “multiplier effects,” and in part because, its authors argue, current climate modeling techniques and computational capacities are inadequate (Idso, Carter, and Singer 2013: 1). Overall, the NIPCC report’s critical analysis of variations over time, including its consideration of future projections, uses time scales similar to those found in the IPCC report.

<Figure 5 about here>

However, the NIPCC reaches a radically different conclusion about the future than the UN-sponsored IPCC report, and this conclusion offers a pathway by which to connect scientific discourse with different ideological framings of time than that of the science/policy establishment. Whereas the IPCC report projects future change,

the Heartland Institute-sponsored NIPCC makes two contrary assertions: (1) the basis for knowing the future is incomplete, and (2) what knowledge can be had shows that “global temperature change is occurring, as it always *naturally* does. A phase of temperature stasis or cooling has succeeded the mild twentieth century warming. It is certain that similar *natural* climate changes will continue to occur” (Idso, Carter, and Singer 2013: vii [emph. added]). Like ideological constructions of the “free market” as natural (Block and Somers 2014), this conclusion subsumes anthropogenic factors into nature, thus contesting a basic premise of geologists who designate the Anthropocene as an era of interaction between society and nature. But in the matter of human interaction with nature, there is an interesting twist of time. Nature, in the NIPCC report, involves a set of processes for which the future is not significantly different than the past. Specifically, “the greenhouse gas-induced global climate signal is so small as to be embedded within the background variability of the *natural* climate system” (Idso, Carter, and Singer 2013: vii [emph. added]). On Earth there always has been variation in climate and there always will be.⁸ The “prudent” policy implication is clear: “prepare for and adapt to *natural* climate events and the threats they pose to society regardless of their origin” (*ibid.* [emph. added]). Implicit is an assumption that “nature” cannot be changed. Explicit is the assertion that climate events occur within nature; thus, any *social* causes of developments are irrelevant. The report thereby constructs an ideological basis for what Ulrich Beck (1995a: chap. 3) terms “industrial fatalism” and the lack of accountability that he identifies as central to risk society in its present construction. Once anthropogenic factors are detached from their specific social sources and subsumed within nature,

ongoing human *practices* are not to be changed. Rather, the solution is to deal with the *consequences* of “nature,” whatever they may be.

In the NIPCC report, science and policy thus are shifted in a direction that accords with the conservative construction of time that Karl Mannheim (1936, 1971) identified as the replication of the past. Such conservatism can be articulated in two broad ways. In a conservative *religious* framing, only God knows the future. Or in *secular* normative terms, the future *ought* to be a replication of the past and its eternal verities. Thus, concerning climate change, an elective affinity emerges between the skeptical science represented by the NIPCC report and currents of conservative thought. Famously, Oklahoma U.S. Senator James Inhofe dismissed the science behind climate-change assertions as a “hoax,” casting his denial in classic religiously conservative terms that involve a temporal construction: “God’s still up there. The arrogance of people to think that we, human beings, would be able to change what He is doing in the climate is to me outrageous.”⁹ A more secular framing is to be found in a comment of the online post by “toner50” concerning a *New York Times* article entitled “Climate change doomed the ancients”:

The Climate has been changing for millions of years and will continue to change no matter what humans do to stop/start it.

If it wasn't for climate change..half of north america would still be under ice and the human race would not be as abundant as it is today. Colder climate equals crop failures, diseases, and a host of other problems. Warmer climate has problems also but not as bad as the cold would be for humans.

Global warming is a hoax to the extent that the predictions of the gurus like al gore and a host of others have not come true and in fact are very very far from reality. ...

Global warming/ climate change is another scheme to separate you from your money whether it is in a Carbon exchange in chicago or by punitive taxes levied by the government.¹⁰

NIPCC challenges to climate science are advanced in parallel with secular and religious tropes of denial that approximate classic themes of temporally infused conservative ideology as described by Mannheim. We cannot know the future, we cannot know God's plan. Climate change is natural and we cannot (or ought not) interfere with the quasi-eternal forces of nature – including human activity subsumed as “natural.” Instead, we must always respond to the conditions that we face on the basis of transcendent moral values or eternal religious truths. In effect, this conservative ideology supports a *laissez-faire* approach to economic and political practice that opposes policies directed toward rationalized governmentality.

Strategizing the future for geopolitical security

A third major approach to constructing the future can be found within power-elite circles where knowledge about the future offers the opportunity to structure present action in order to gain an advantage under conditions of competition or conflict. The rationalist science/policy construction points toward this *strategic* exercise of political power when regulation, mitigation, and remediation are

proposed as responses to anticipated developments, especially when they are framed in terms of threats to human security (for example, in the collection edited by Sygna, O'Brien, and Wolf, 2013). But such formulations entail decisions that are overtly political, and more science-based actors like those producing the IPCC report have been notably cautious about employing them, for fear of undermining their scientific legitimacy.

In its core logic, strategic temporality constructs the future on a different basis than diachronic mapping, one more akin to game theory. In this construction, actors seek to gain advantage in relation to other actors with whom they are engaged in competition or conflict. Actors who operate through strategic constructions of temporality are thus concerned with the direct exercise of power – responding to predicted or otherwise anticipated events in ways that enhance their own positions by achieving their goals or preventing opposing parties from achieving theirs. In relation to climate change, it would be possible to chart strategic constructions of the future in a variety of domains, including capitalist corporations (see Stehr and Grundmann 2012: 36, who cite Shell Oil's now controversial use of "scenario planning" to gain advantage over competitors under various climate-change scenarios), as well as corporations under direct pressure to deal with the consequences of their practices (Slawinski and Bansal 2012).¹¹ As we already have seen, conservative denialism is a domain structured in part by strategic action on the part of corporation-oriented neoliberals who seek to avoid the economic costs of adjusting to climate change.

A radically different strategic construction anticipating future climate change is to be found within the domain of the single most powerful actor on Earth – U.S. global security, encompassing military, diplomatic, and other strategic actors seeking to contend effectively with developments connected to international politics and conflict.¹² At least since 2003, the U.S. has sought to address issues of climate change in relation to national security, and increasingly this concern has been expressed in terms that involve the militarization of “stability operations” (Schwartz and Randall 2003; Hartmann 2013).

How temporality can be constructed relative to issues of geopolitical security is displayed in a report by the CNA Military Advisory Board, hereafter, MAB (2014), entitled *National Security and the Accelerating Risks of Climate Change*. The CNA Corporation is a “non-profit research and analysis organization” that originated in the 1940s from a group of MIT scientists who conducted operations-research analysis to help the U.S. Navy counter the threat of German U-boats. Today, CNA’s MAB is described as “an elite group of retired three- and four-star flag and general officers from the Army, Navy, Air Force, and Marine Corps.”¹³

Strategic actors may be advised not to reveal plans or contingencies, except, perhaps, to mislead, in case showing their hands might aid their opponents (Goffman 1969). For that reason, the CNA report can only be regarded as suggestive. Nevertheless, because the MAB is external to military, intelligence, and diplomatic actors in the U.S. government, it can raise issues that government agencies might be more circumspect in discussing. Its report thus offers a public distillation of climate-change issues of concern for the U.S., providing something of a roadmap for U. S.

geopolitical strategy. Agents of the government would be lacking in due diligence if they ignored the issues raised by the CNA MAB. Indeed, its report is laced with references to U.S. military and intelligence assessments. Clearly, the U.S. global security apparatus is engaged in strategic planning related to climate change.

How, then, does the CNA MAB report construct the future? Its central premise is that climate change is happening. Discussion therefore centers on the social consequences of climate change and their geopolitical strategic implications. The summation (2014: 2) is stark: “climate change impacts are already accelerating instability in vulnerable areas of the world and are serving as catalysts for conflict.” A sense of foreboding emerges from merely listing its topics of concern: the planet is undergoing “more frequent and/or intense weather events,” “prolonged drought,” “unprecedented wildfires,” “rising sea levels,” and a “record melting of the Arctic ice” (2014: 7). Climate change will not only yield “threat multipliers,” its impacts will “serve as catalysts” for developments as diverse as the pursuit of power by non-state actors in Africa, international competition for resources in the Arctic triggered by the melting of “old ice,” decreased security of fragile nation-states that are impacted by rising sea levels, the undermining of infrastructure and the economy in the homeland, and developments that will challenge U.S. military preparedness to deal with conflicts worldwide.

As with state geopolitical operatives more generally (Hall 2009: 191-92, 213), there is a blending of strategic and diachronic action registers. On the one hand, the CNA MAB report is laced with discussions of strategic concerns about developments that would undermine what the report (2014: 3) terms “National Power.” It

discusses “interrelated and cascading effects” and developments that pose “a strategic security risk,” and it notes that “climate change can act as a threat multiplier for instability in some of the most volatile regions of the world” (2014: 5). In response, the report (2014: v) calls for “lowering the risks,” arguing, “time and tide wait for no one.” As one MAB board member, a retired general, is quoted, “If you wait until you have 100 percent certainty, something bad is going to happen on the battlefield” (2014: 1). And the report emphasizes the need to anticipate developments: “Unfortunately, we cannot wait 20 years to begin to factor in the projected impacts of climate change in force-shaping decisions. We must add those impacts to the decision matrix today”(2014: 23).

Yet for all the anticipation of future risks with strategic implications, proposed responses to risks are couched in terms of planning, in the diachronic register of policy analysis. Thus, the recommendations of the CNA MAB report (2014: 5) assert that the “U.S. Military’s Combatant Commanders (CCDRs) should factor in the impacts of climate change across their full spectrum of planning and operations.” To be sure, the report (2014: 29) is quite clear that efforts must be made to reduce climate change “where possible,” but, “for everything else, factor those changes into all our choices about America’s future national security.”

The CNA report offers a summative view of climate-change implications for the strategic “National Power” interests of the U.S. It is not concerned with plotting events on a diachronic scale of time. Rather, prediction and likelihood of future events are translated into a different register, that of strategic anticipation of risks that drives planning on the basis of those risks. The strategic stakes differ from

those of neoliberals seeking to forestall costs to corporations of dealing with climate change. The report takes the reality of climate change as its premise, in turn asserting a substantial likelihood that ecological, social, and political developments will affect strategic geopolitical interests, and it urges planning that will increase “resilience” in the face of risks associated with developments associated with climate change. The domain of U.S. geo-political security has substantial power to pursue this strategic interest, and on multiple fronts. But as Nagel (2011) laments, pursuit of U.S. strategic interests does not either mitigate global warming or help populations most threatened by climate change.

When is the Apocalypse?

The apocalypse lurks behind every anticipated future of climate change. Even the science and policy domain – like institutionalized churches that seek to undermine sectarian apocalyptic theologies – faces the challenge of trying to trump the apocalyptic. Charting climate change is a first step in that direction, one that would subordinate the apocalyptic to rationalized diachronic time. Although scientists and policy advocates sometimes invoke rather apocalyptic scenarios that they warn would be the consequences of inaction, in its centrally diachronic orientation, science is much more directly aligned with policy analysis.

In contrast, conservative ideology, which provides the hermeneutic base for popular skepticism and denial, might seem to deny the apocalyptic altogether, by emphasizing the eternal variability of nature. Yet conservatism is haunted by apocalyptic temporalities both at its core and on its fringes. At its core, conservatism

embraces an “eternal return” to the ways of life that have endured, to the values that are transcendent. And this “return,” structurally, reaches the same temporal register as apocalyptic movements that envision a postapocalyptic “heaven on earth,” where there is no time, no history, because eternal utopian verities erode any impetus for change (see figure 1).

On the other hand, at the fringes of conservatism, two overlapping tendencies traffic in the apocalyptic more directly. First, for many years, some conservative Christians have sought out the apocalyptic denouement of a civilization deemed wicked. For them, the apocalypse is welcomed as the end of the world as we know it and, more importantly, the arrival of God’s dominion on Earth. Thus, not surprisingly, research on U.S. public opinion shows that compared to Americans in general, those respondents who believe in Christian end-times theologies are less likely to embrace policies designed to deal with climate change (Barker and Bearce 2012). Second, extreme right-wing ideological groups regard climate change as yet another lie used to justify a liberal power grab, which at the radical fringe requires mobilization of an apocalyptic warring sect to undertake resistance to government in the face of an America besieged by “socialism.”

Fringe right-wing ideological groups that seek war against the U.S. government as an apocalyptic Other might seem to share a *pre*-apocalyptic orientation with the U.S. military. But there is a key difference. Insofar as the U.S. global geopolitical security domain becomes apocalyptically oriented, its concerns center on *non*-U.S. apocalyptic warring groups. Thus, the CNA report (2014: 2, 7, 13) is laced with warnings about the rise of non-state actors, notably terrorist groups,

that seek to take advantage of conditions generated by climate-change crisis. In a very real sense that nevertheless is largely left implicit, geopolitical security requires a war against apocalyptic actors, including those who prey upon social disruptions predicted to ensue from climate change. More broadly, the CAN MAB report focuses on how to countermand various social consequences of climate change – floods, famines, wars, death – the kinds of events portrayed in the Bible’s Apocalypse of St. John with the imagery of the four horsemen.¹⁴

Environmental movements: between the diachronic and the apocalyptic

All climate-change domains are haunted by the apocalyptic. Participants in environmental movements have anticipated it. Beginning with Rachel Carson in her 1962 book *Silent Spring* (Killingworth and Palmer 1996), they have embraced the “political reflexivity” that Ulrich Beck described as an “aware[ness] of the general threats to life in the milieu of bureaucratically administered security,” including recognition that “the guardians of rationality and order also legalize threats to survival” (1995b: 3). Their often situationally transcendent critical stances pose a stark alternative to the positive, cynical, and negative fatalism that Beck has described (1995a: 65-67). Environmental movements act in the strategic time of struggle. However, though movements often develop lines of communication with policy-makers and politicians, they lack institutionalized power, and thus, interests in bringing about change have yielded diverse movement agendas for action. More than actors in the domains considered so far, environmental movements confront a problematic that transcends issues of politics and power, variously construed, for

they position their actions in relation to the apocalypse that their adherents have prophesied.

Historically, diverse apocalyptic constructions, both millenarian religious and secular – from Zoroastrian religion through various Christian theologies, to the French Revolutionary, and on to marxist and anarchist utopias – envisioned a pre-apocalyptic period leading up to a traumatic event followed by a postapocalyptic utopia – the triumph of good over evil, the Millennial Kingdom, or post-revolutionary society. In recent decades, however, postapocalyptic utopia has been displaced by postapocalyptic *dystopia*, a decimated world where life is brutish, hard, and short. Crucially, for environmental movements this development shifts the nature of pre-apocalyptic anticipation. Whereas a pre-apocalyptic warring sect seeks to bring on and triumph in a struggle against the established social order meant to *bring about* postapocalyptic utopia, environmental movements instead pursue one or another strategic temporal line of action to *avoid* a future dystopia (cf. U. Beck 1995b: 3-4). Thus, participants in one of the most adversarial of movements, Earth First!, characterize a “war” to *stop* a pipeline, and more generally, activists carry out strategic actions aimed to *prevent* environmental destruction.¹⁵ Nor is this construction only that of a radical environmental organization. One of the broadest activist environmental-movement organizations, Greenpeace, uses similar language in describing campaigns to “protect” the environment and “stop global warming.”¹⁶ And even the most mainstream of environmental NGOs, the Sierra Club and the Natural Resources Defense Council, while embracing diachronic policy struggle, couch their aims in the language of *closing* coal plants, *ending* the use of tar-sands oil,

and *stopping* “destructive drilling for natural gas.” An exception that suggests the centrality of the apocalyptic can be found in the World Resources Institute, a more establishment non-governmental organization funded in part by governments and foundations, where the approach is marked by a diachronic policy orientation directed to “transformative solutions.”¹⁷

A particularly strong apocalyptic construction can be found in the so-called Peak Oil movement, whose activists have warned for decades about the need to transition to non-carbon based sources of energy on the basis of predictions about the declining supply of oil. Some Peak Oilers have fixed on specific predictions about the date by which oil-based energy supplies would begin to decline. An article in *Scientific American* by Campbell and Laherrère (1998), “The end of cheap oil,” predicted the peak to occur before 2010. Later predictions keep moving the date forward. Most recently, the Post-Carbon Institute put the year as “around 2016.”¹⁸ The problem is that dire predictions about the actual date of the apocalyptic crisis have not been borne out... yet. Moreover, technological optimists, whom Ulrich Beck (1995a: 65) groups under the flag of “positive fatalism,” counter that human societies will simply innovate in order to contend with resource shifts, as they have many times in the past. Diachronic time may have a few bumps, but it is onward and upward!

Peak oilers have found themselves in a situation similar to certain apocalyptic religious conversion movements that predicted the End to arrive on a specific date – people like the late Harold Camping, who anticipated the Final Judgment to come on May 21, 2012. As with other apocalyptic constructions, the

possible trajectories are diverse. A movement may undergo something like the “Great Disappointment” that the followers of William Miller experienced when his (several times recalculated) prediction of the Second Coming failed to materialize – for the last time on October 22, 1844. Yet temporally accurate prophecy is not the whole story. It is worth noting that some followers of Miller founded the Seventh Day Adventist Church, a sect in which lurid discourses anticipating hellfire and brimstone have led believers to expect the final Day of Judgment any day now for more than a century and a half (Hall 2009: 151-52).¹⁹ More generally, pre-apocalyptic predictions about the End Times have long served as a stock-in-trade of Protestant Christian conversion movements that bring people into the fold by warning of the Final Judgment soon to come. Whether or not apocalyptic prophecies are borne out, they can have consequences for those who believe.

The Peak Oil movement may ultimately prove to be on firmer ground than most pre-apocalyptic conversion movements, for the amount of carbon-based fuel on the planet is finite. And like religious movements anticipating the Apocalypse any day now, Peak Oil predictions already have had consequences, at least for proponents of the claims. Amidst diverse currents of broader contemporary apocalyptic survivalist culture, Peak Oil ideas have provided some of the inspiration for the “Transition movement” concerned with preparing for the era when carbon-based energy would no longer be abundant. That movement is not simply comprised of small countercultural “ecovillages” trying to move “off the grid.” It also includes community groups and entire municipalities that have embraced the label of “Transition Towns” and oriented their planning and policies toward sustainable

practices that include radical reduction of carbon-based fuels – by generating electricity locally, reducing energy use, reorganizing community transportation, and other initiatives.²⁰ Here, as in science and policy circles, and in mainstream environmental movements, pre-apocalyptic scenarios become backdrop to concrete action meant to bend the diachronic curve of the future. However, especially in the ecovillages, action is centered in the transformation of practices in the here-and-now of everyday life, sometimes construed as offering a laboratory and model for wider transformations (Litfin 2014).

However, for true believers who see existing civilization and its economic basis as ultimately doomed, “warring” strategic action in pre-apocalyptic time can seem inadequate and exhausting; transforming practices in the here-and-now, futile. Even when the promise of postapocalyptic utopia motivates, apocalyptic anticipation can give way to burnout. All the more so if the pre-apocalyptic struggle is not to gain victory over evil so as to inaugurate a glorious future but rather to prevent a postapocalyptic dystopia looming ever sooner in the face of a civilization that seems permeated by disbelief and self-interested denial, indifference and skepticism, to say nothing of ignorance.

What course of action is there for the pre-apocalyptic “warrior” who becomes disillusioned in the face of overwhelming civilizational challenges? In an earlier era, in “Science as a vocation,” Max Weber offered heroic masculinist counsel:

To the person who cannot bear the fate of the times like a man, one must say: may he rather return silently, without the usual publicity build-up of renegades, but simply and plainly. The arms of the old churches are opened

widely and compassionately for him. After all, they do not make it hard for him (Weber 1946: 155).

But in the throes of apocalyptic struggle – these days, over climate change – matters are not so simple. Apocalyptic warriors do not seem so interested in returning to the churches of the past. They may choose instead to find a small corner of the world where they can pursue a postapocalyptic future – one that does not deny climate change but neither any longer tries to sound the alarm to a world teeming with people driving SUVs stranded in traffic jams whose radios would not carry countercultural programming in any event.

Having envisioned the inevitability of environmental collapse in what they call an “age of ecocide,” British activists Paul Kingsnorth and Dougald Hine have decided that it is too late to struggle further. Their passionate Jeremiad, *Uncivilization*, might seem to move from activism to industrial fatalism, a position that Ulrich Beck characterized by noting, “even the pessimists ground their pessimism precisely in the inexorability and uncontrollability of industrialism” (1995a: 67). But Kingsnorth, Hine, and their associates in the Dark Mountain Project reach an existential point beyond either pre-apocalyptic environmental movement or fatalism. *Uncivilization* challenges the value of the effort centered in diachronic time to bend the future curve of carbon saturation to an acceptable level. Civilization has been constructed on top of “battery chicken sheds; industrial abattoirs; burning forests, beam-trawled ocean floors; dynamited reefs; hollowed-out mountains; wasted soil.” Try as elites may to offer assurances that this is the best of all possible worlds, Kingsnorth and Hine assert, “We do not believe that everything will be fine.

We are not even sure, based on current definitions of progress and improvement, that we want it to be.” *Uncivilization* unveils a much wider denial than that of skeptics and conservative pseudoscientists – a mainstream psychoanalytic denial by people who cannot contemplate the coming of a world without “supermarkets and superhighways.” What is to be done? In the Manifesto’s vision, the time has come for “Uncivilized art,” including writing that envisions a time beyond the present civilization in “new stories” about the future. The manifesto starkly concludes, “The end of the world as we know it is not the end of the world full stop. Together, we will find the hope beyond hope, the paths that lead to the unknown world ahead of us” (Kingsnorth and Hine 2009).

Uncivilization has been labeled “nihilistic,” its authors, “crazy collapsitarians” (q. in Smith 2014: 31). The Project’s adherents eschew the conventional social-movement pursuit of power to bring about change. Instead, they bear witness to the Apocalypse, not ready to propose a utopia but neither willing to engage in an all-out struggle against what they regard as the inevitable. Perhaps, with time, they will mirror Native American ghost dance religions, sometimes treated in anthropological terms as “revitalization movements” that seek to reaffirm cultural patterns in the face of social and cultural collapse (Wallace 1956; Kehoe 2006). But the scale is global, not tribal. If the bleak vision of doom in *Uncivilization* comes to pass, developments in the global social order likely will parallel those of the Ghost Dance religion: “revitalization” will not transpire along anything like the lines of previous society, economy, and culture.

The last major episode of global warming was the waning of the ice age that transpired between twenty and ten millennia ago. Then, the land bridge from Europe to Great Britain disappeared and rising sea levels obliterated whole forests and villages, leaving behind “mythological” stories of lost kingdoms.²¹ If present-day scientists are correct in their projections, the Dark Mountain Project holds, civilization cannot possibly continue in anything like its present form. To make the future, people will have to make new stories about who we are, why we are here, and how we are to live. Far from the conventional environmental movements that act in strategic time to alter the diachronic future before it is “too late,” the Dark Mountain Project envisions an heroic embrace of the apocalyptic future.

Coda

The present study has employed a structural phenomenology to explore cultural structures of meaningful action in relation to the future in different social domains concerned with the issue of global climate change. The study has implications for social theories of institutions, for research on social aspects of climate change, and for social engagement with climate change as a public issue.

Theorizing social institutions

A challenge of social theory since the eclipse of Talcott Parsons's systems theory has concerned how to theorize macro-social phenomena in ways that address the conventional gap between structure and agency. Pierre Bourdieu's field theory has been both promising and attractive as an approach, in part because it facilitates scrutiny of supra-organizational realms where individuals and groups pursue strategies of action. However, field theory does not provide much basis for: understanding how different fields articulate with one another, analyzing social complexes that transcend the dynamics of any given field, or identifying social processes and forms of action other than strategic ones of competition for power and position and conflict over jurisdiction. Structural phenomenology begins to address these issues by building from field theory to a wider theorization of social formations. Its phenomenological focus on temporal registers of action and organization provides a theoretical basis for showing whether and how different fields are drawn together in radically alternative domains composed on the basis of articulations among different temporal action registers.

In contrast to field theory, the structural phenomenology of action registers identifies alternative modes of action central to different forms of social organization. Strategic action, the dominant type of action in field theory, is an action register fundamental to social forms of competition and conflict, but that dynamic hardly exhausts social modalities of action and organization. Rather, among other possibilities, formal organization is centered in replicable and transposable diachronic action whereas community is based on ritual action

oriented to the production of solidarity. No social phenomenon could exist based solely on organization in one register of action. However, various social domains can be described according to how their conventional ranges of activities articulate different registers of action, sometimes relatively cohesively, other times, less so. In turn, the relationships between social domains can be identified according to whether and how they share a particular register of action, as science and policy do in some respects with geo-political security in diachronic action.

Structural phenomenology thus offers a general program for building institutional theory. It anticipates that not all social action is equally concerned with contestation and that orientations toward power, as well as manifold capacities to exercise it, do not always result in struggles that are politically joined within some posited general field of power. Different social processes unfold in different domains. Understanding those domains and their relationships and aporias with one another makes it possible to theorize overall institutional orders and broader social formations as concatenations of social worlds where fundamentally different things are happening.

Understanding domain orientations to climate change

Substantively, structural phenomenology has served in this study as the framework for analyzing four domains oriented to climate change. The analysis locates particular social fields – such as climate-change science, policy analysis, and conservative American Christianity – in relation to the broader social domains. It demonstrates how alternative cultural structurations of climate change are located

in heterogeneous social domains, each with its characteristic ideological formations, range of actions, pattern of social organization, and ways of seeking to exercise power.

The domain of climate science and policy, centered in diachronic temporality, is characterized by affinities and tensions that bridge science versus policy. The alternative stakes of science and policy mark them as different fields, but they share a core diachronic thematization of action that provides a (contentious) pathway between them. This domain stands in radical alterity to the domain of skepticism and denial, where various scientific claims typically are not centrally oriented to audiences in the science-policy domain; rather, they are positioned in relation to strategic action of denial that connects to other temporal registers of action, notably those formed in conservative religious and secular conservative ideologies of eternity – of God and nature, including social practices deemed natural.

By contrast, elites operating in the geo-political security domain deal through strategic action with the consequences of events such as flooding and famine on basis of assuming that climate change is indeed occurring. In its modern configuration, strategic security action is formulated in significant part through planning within a diachronic construction of temporality. The domain is the one considered here that most clearly approximates a field. However, in relation to Bourdieu's theorization of power as an encompassing field, geo-political security lacks political stakes shared with either climate-change science or policy fields, broadly defined, even though it builds on climate science, it has a policy interest, and all three fields are indirectly connected via U.S. politics. In contrast to the

science/policy domain, its stakes are oriented to national interests in power in a global field populated with other similarly oriented contestants.

Finally, the domain of environmental movements has a distinctive range of actions that can be specified in temporal terms, tethered to the discourse of environmental apocalypse found among otherwise diverse movement organizations. These organizations either struggle to prevent a dystopian future from arriving or they seek to accommodate themselves to a postapocalyptic world, whatever it may bring. Their actions range from advocacy of substantial diachronic policy intervention, to strategic programs of environmental action, and, at the other pole, the fatalistic postapocalyptic heroism of the Dark Mountain Project.

Overall, the future of climate change is culturally structured in radically different pathways of action and organization within the four domains. These domains amount to alternative social worlds, culturally bounded as finite provinces of meaning. Although each of them is concerned with global climate change, actors oriented to the different domains cannot all be said to be directly engaged in contestation within some broader field of power. To be sure, there are power engagements across domains, most notably, in the struggles of denial and skepticism against policy, and in the more diachronically oriented among environmental movements seeking to effect policies. On the other hand, shared knowledge and broad functional consequences of action notwithstanding, there is no obvious engagement between certain domains, for example, between scientists studying arctic melting and environmental activists seeking new narratives about the future of civilization. Yet history is open-ended. The present cultural mapping of

how four domains are structured at a given historical juncture establishes benchmarks, thereby facilitating further research concerning these and other domains, their histories, trajectories, and reconstructions in relation to one another and to climate change. In future research, it would be important to investigate other fields and domains, especially the corporate domain, politics, the media, the public sphere of civil society, everyday life, non-U.S. and non-Western domains oriented to climate change, and the domain of international governance. Temporally centered analysis of domains should also be directed to analyzing the range of concrete policies and actions proposed to respond to climate change.

Social engagements with climate change

In broader social terms, because it is based in a phenomenological analysis of action, the present identification of cultural structurations of climate change can facilitate public engagement across existing and emergent domains. For climate change, as Glaeser (2014) holds more generally, a major contemporary challenge for sociology is to open up to public consideration social choices about futures. To do so is to move beyond sociology narrowly construed and into projection of alternative scenarios. Structural phenomenology offers an analytically grounded way to do so. As I noted at the outset, divergent orientations to climate change seem to transcend the potential for communicative rationality sought by Habermas (1987) as the basis for civic discourse. The present analysis demonstrates the social bases of this intractability by showing how different social domains are culturally constructed. Specifically, because the structural phenomenological study of domains identifies

their cultural specificities and hybrid features, it can be used to identify affinities and grounds for rapprochement across domains, opening up the question of how things might be different. Clearly, there are antinomies between radically alternative cultural constructions of the future – between scientific and planning scenarios and geopolitical strategic action, between ideologies of denial and of progress, between environmental movements that seek to stop or prevent new degradations of the planet and policy proposals that might produce unintended climate conditions.

What, then, are possible bases for domain transformations in relation to climate change? Because of mediated diffusion, denialism is a serious impediment to collective action despite its scientifically marginal status (McCright and Dunlap 2011; Jenkins 2011). As a domain it continues to bind together entrenched economic interests, anti-state libertarian ideology, and certain strands of conservative religion. In the bargain, the media focus on a science/skepticism binary deflects attention from directly addressing the implications of climate change. Yet the complexly hybridic character of skepticism and denial as a domain yields an instability in how its strategic interest is articulated with both science and ideology. On the former front, the domain's sometime claims to draw on legitimate science while contesting most climate-change science leaves it open to "disclosures" of nature and new scientific findings, both of which may cast increasing doubt on the skepticism. On the other front, conservative ideology centered in the eternity of nature acknowledges a certain role for human agency: even if nature cannot be changed, humans have always adapted to the conditions of social life. Even if only

God knows the future, in some theological dispensations, God's people sometimes act in ways that fulfill divine purpose. Although the strategic promotion of denial is strongly driven by economic interests that will not quickly change, the consolidation of the domain built out through elective affinities with science and conservative ideology is unstable.

On other fronts, many actors concerned with climate change remain institutionally contained by their fields and domains. Within the climate science/policy domain, as we have seen, scientists are constrained by norms that militate against policy advocacy. For their parts, policy analysts remain limited by the politics of the power fields in which they participate. The institutional structures of knowledge production persist through inertia under conditions that undermine the utility of knowledge that is produced and no institutional arrangements yet offer the basis for a more practical approach to knowledge (Stehr and Grunmann 2012). In an altogether different domain, geo-political security is oriented toward contending with consequences of climate change for strategic interests rather than addressing climate change itself. Institutionally, then, these domains are open to significant reconstructions that would alter the kinds of knowledge produced and actions undertaken.

What, finally, of the environmental-movement domain? Here, the apocalyptic orientation to crisis animates collective value-rational action, but the specific register of action is open. Because social movements are not institutionally locked in as to their structures, the possibilities are diverse. On the side of diachronic action, movements have the latitude to encourage new relationships with science and

policy, while on the front of strategic action, they can foster political mobilization in support of dealing with climate change, as the Citizens' Climate Lobby is doing, to promote a carbon tax.²² Finally, because they operate broadly in the public sphere, they have the potential to forge new communities of interest, new ethics of action, and new political agendas.

Overall, analyzing cultural structurations of diverse domains offers a basis for considering their programs, their possibilities and limitations, possible affinities, mutual accommodations, and lines of development. Further research should consider alternative ways that domains might be structured. Given global complexity, actions in relation to climate change will unfold in multiple fields and domains, in myriad courses of action, some of them though diachronic governmentality, others in strategic action, still others in mobilized solidarity of communities. We are already living the future in the here-and-now anticipating it. The question is, how?

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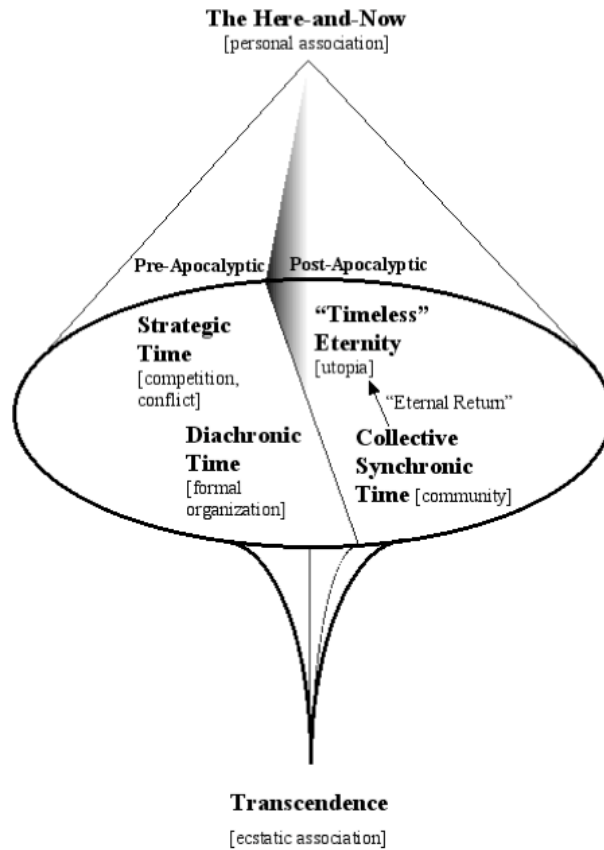


Figure 1: A general model of registers of meaningful social temporality that structure interaction in the vivid present, with associated typical forms of social organization in brackets (Hall 2009: 12).

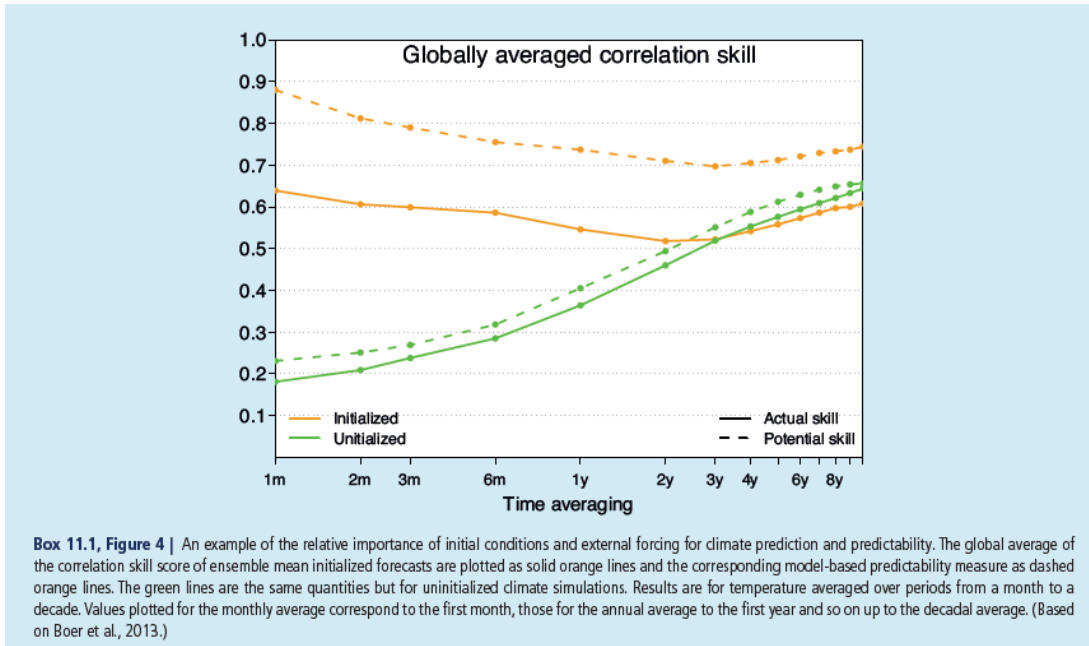


Figure 2: Example of IPCC graph showing how period length in time averaging affects accuracy of predictions (from IPCC 2013: 961).

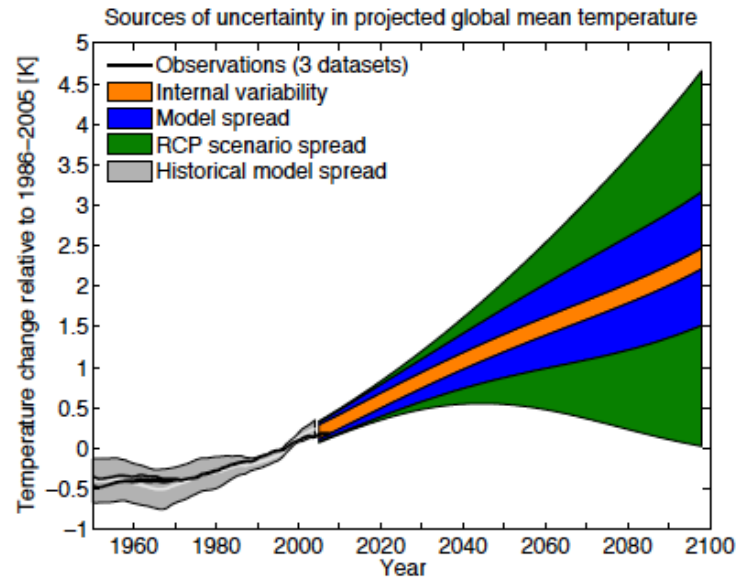


Figure 3: IPCC graph showing degree of internal model variability and external model and scenario spreads over calendar time (IPCC 2013: 979, Figure 11.8[a]).

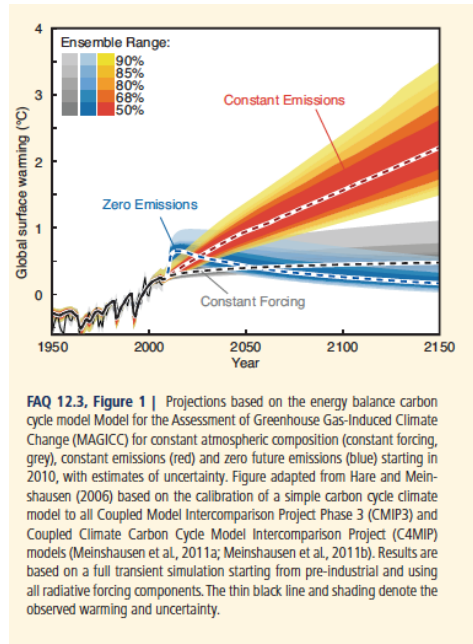


Figure 4: Model-based projections of global surface warming in relation to alternative forcing scenarios (IPCC 2013: 1106).

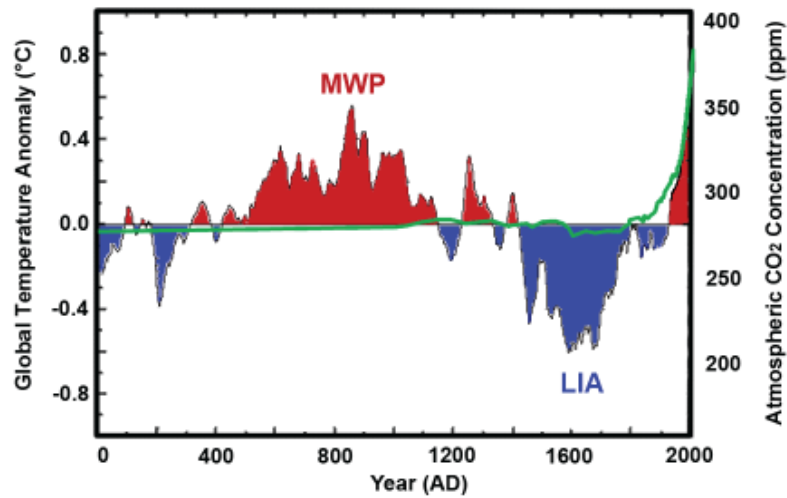


Figure 1.1.1. The mean relative temperature history of the Earth (blue, cool; red, warm) over the past two millennia highlighting the Medieval Warm Period (MWP) and Little Ice Age (LIA), together with a concomitant history of the atmosphere's CO₂ concentration (green). Adapted from Loehle, C. and McCulloch, J.H. 2008. Correction to: A 2000-year global temperature reconstruction based on non-tree ring proxies. *Energy & Environment* **19**: 93–100.

Figure 5: Climate change over 2,000 years (Idso, Carter, and Singer 2013: 18).

Footnotes

¹ For example, various domains of business centrally concerned with climate change are considered only insofar as they impinge on climate-change skepticism and denial.

² The analysis is based on a phenomenology of time-consciousness grounded in the work of Henri Bergson and Edmund Husserl. For a brief exposition, see Hall (1975: 43-51).

³ For a discussion of IPCC structure more generally, see Stehr and Grundmann 2012: 34-36.

⁴ The developments of policies designed to deal with climate change are so extensive and widely diffused that their analysis is not pursued here. On the politics of policy implementation from a pragmatic mainstream standpoint, see Giddens (2011).

⁵ See Coral Davenport and Julie Hirschfield Davis, "Move to fight Obama's climate plan started early," *New York Times*, 3 August 2015, <http://nyti.ms/1N5fcD5>, accessed 11 August 2015.

⁶ Climate-change skeptics have made much of a supposed "pause" in global warming during a recent 15-year period; see *The Economist*, March 8, 2014, <http://www.economist.com/news/science-and-technology/21598610-slowdown-rising-temperatures-over-past-15-years-goes-being>, accessed 11 August 2015; however, recent research casts doubt on the supposed hiatus; see Justin Gilles, "Global warming 'hiatus' challenged by NOAA research," *New York Times*, 4 June,

2015, <http://www.nytimes.com/2015/06/05/science/noaa-research-presents-evidence-against-a-global-warming-hiatus.html> accessed 5 June 2015. On denial based on the use of surrogate scientists not centrally involved in climate-science research, see *Slate*, January 14, 2014,

http://www.slate.com/blogs/bad_astronomy/2014/01/14/climate_change_another_study_shows_they_dont_publish_actual_papers.html, accessed 11 August 2015.

For a rejoinder to climate-science skepticism and a critical history of its sources and strategies, see Greenpeace, <http://www.greenpeace.org/usa/report-as-climate-denial-gets-stronger-the-dealing-in-doubt-continues/>, accessed 11 August 2015.

⁷ The Heartland Institute apparently has received support from the Koch brothers, among other conservatives and major corporations. See *The Christian Science Monitor*, February 15, 2012,

<http://www.csmonitor.com/Science/2012/0215/Documents-reveal-Koch-funded-group-s-plot-to-undermine-climate-science>, accessed 11 August 2015, *Salon*,

http://www.salon.com/2013/02/01/koch_brothers_donated_big_to_alec_heartland_institute/, accessed 11 August 2015, and *The Huffington Post*,

<http://www.huffingtonpost.com/peter-h-gleick/-the-origin-of-the-heartland-1289669.html>, accessed 11 August 2015.

⁸ Such a formulation echoes the rhetoric of “The resilient Earth,” a publication put out by the John Birch Society in 1992; see Brown and Herndl 1996.

⁹ Quote, among many examples: <http://www.rightwingwatch.org/content/james-inhofe-says-bible-refutes-climate-change>, accessed 11 August 2015. See also Inhofe

(2012). Fisher, Waggle, and Leifeld (2013: 84) show Inhofe to be centrally placed in climate-change denial networks.

¹⁰ *New York Times* 5/27/2013,

<http://www.nytimes.com/2014/05/28/opinion/climate-change-doomed-the-ancients.html>, accessed 11 August 2015. Entire quote, *sic*.

¹¹ On the controversy over Shell, see MacKenzie Funk, "Shell Oil's Cold Calculations for a Warming

World," *New York Times Magazine*, 15 May 2015, <http://nyti.ms/1ETvTLD>, accessed 11 August 2015.

¹² Lachmann (forthcoming, 2016) provides an analysis of the strategic challenges of climate change to states.

¹³ See <https://www.cna.org/mab>, accessed 11 August 2015.

¹⁴ A recurring trope of environmental apocalypticism (e.g., at

<http://blog.conserveland.org/2012/04/03/the-four-horsemen-of-the-apocalypse-environmental-destruction-of-our-own-making/>, accessed 11 August 2015), and its denial (for which, see CAN 2014).

¹⁵ See <http://earthfirstjournal.org/newswire/2014/06/19/vancouver-crowd-jubilant-as-war-declared-on-northern-gateway/>, accessed 11 August 2015, and other website reports.

¹⁶ See <http://www.greenpeace.org/usa/en/campaigns/>, accessed 11 August 2015.

¹⁷ See the Sierra Club donation page,

https://secure.sierraclub.org/site/Donation2?df_id=19722&19722.donation=form1,

accessed 11 August 2015. The Natural Resources Defense Council uses much the same language; see <http://www.nrdc.org>, accessed 11 August 2015. The most moderate language is that of the environmental organization perhaps least antagonistic to industry and the established order, the Nature Conservancy, <http://www.nature.org/?intc=nature.tnav>, accessed 11 August 2015. For a telling comparison of its rhetoric with that of Earth First!, see Cooper 1996. Beyond environmental movements, see the NGO, the World Resources Institute, <http://www.wri.org/our-work/topics/climate>, accessed 11 August 2015.

¹⁸ See the Post-Carbon Institute website, <http://www.postcarbon.org/after-peak/>, accessed 11 August 2015.

¹⁹ This comparison has not been lost on peak-oil debunkers; see <http://resourceinsights.blogspot.com/2006/08/apocalypse-always-is-peak-oil-movement.html>, accessed 11 August 2015.

²⁰ For a web-based transition movement centered in the Peak Oil thesis, see <http://transitionus.org/why-transition/peak-oil>, accessed 11 August 2015. Among many sites describing the transitions communities' activism, see <http://www.transitionnetwork.org>, which also associates the transition movement with Peak Oil issues, accessed 11 August 2015.

²¹ Katrin Bennhold, "A sunken kingdom re-emerges," *New York Times* June 23, 2014, <http://www.nytimes.com/2014/06/24/science/a-sunken-kingdom-re-emerges.html>, accessed 11 August 2015.

²² Citizens' Climate Lobby, <https://citizensclimatelobby.org>, accessed 11 August 2015.