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Noel Castree

Global Change Research
and the “People Disciplines”:
Toward a New Dispensation

Climate scientists today enjoy an extraordinary epistemological privilege. They make claims about the global atmosphere that are simultaneously claims upon the totality of humanity. Summarized as average temperature targets, shrinking carbon budgets, and parts per million concentrations of greenhouse gases, these scientists’ findings and predictions are provocative. They invite us to identify and eliminate the root causes of atmospheric change that will soon rewrite the global geography of ecosystems, coastlines, ice sheets, and much else besides. Relatedly, they invite us to ask deep questions about how we should live on our one and only planet. But these scientists are not alone. In recent years their warnings about “dangerous climate change” have been folded into a set of much grander scientific pronouncements. Teams of environmental researchers across several disciplines have together sounded the alarm about the unprecedented scale, scope, and magnitude of the human impact on earth. Proclamations about the end of the Holocene (Steffen et al. 2011), the prospect of biophysical tipping points (Barnosky et al. 2012), and the imminent transgression of “planetary boundaries” (Rockström et al. 2009) all position anthropogenic climate

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1 change as one aspect of a much larger problem: namely, an entire “earth sys-
 2 tem” perturbed by peoples’ collective activities over several decades. Today
 3 humans are not merely climate changers: we are, so many scientists tell us,
 4 akin to a geological force capable of altering the cryosphere, biosphere,
 5 hydrosphere, lithosphere, and atmosphere simultaneously.

6 In this article I consider how the epochal claims emanating from
 7 a range of geoscience disciplines—including but going beyond climate
 8 science—relate to the social sciences and humanities (the “people’s disci-
 9 plines,” hereafter SSH). If these disciplines speak of an earth in crisis, then
 10 the environmentally inflected parts of the SSH have an equally weighty
 11 responsibility and opportunity. At the level of both the “is” and the “ought,”
 12 they get to speak for some or all of the 7 billion *Homo sapiens* implicated in
 13 the drama of global environmental change. They have a chance to signifi-
 14 cantly shape public understanding of what an anthropogenic earth means
 15 for us and nonhumans; they could, directly or otherwise, influence decision
 16 making in politics, business, and the third sector. In addition, they might
 17 feasibly “speak back” to the geoscientific research that is already inspiring a
 18 lot of activity in the SSH. This is because the “social heart of global environ-
 19 mental change” (Hackmann, Moser, and St. Clair 2014) might require a dif-
 20 ferent sort of geoscience in order to beat strongly in the future.

21 I use the conditional terms *could* and *might* because the SSH are not
 22 yet changing the broader intellectual climate within or outside universities
 23 to any notable degree. Currently, the discourse about global environmental
 24 change is dominated by natural scientists—in academia and the wider
 25 world. The pope’s 2015 encyclical, *Laudato Si’*, is one of the exceptions that
 26 prove the rule; others are the best-selling books authored by a few promi-
 27 nent, environmentally minded commentators such as Bill McKibben, Tim
 28 Flannery, and Mark Lynas. The balance needs to shift toward the broader
 29 SSH so that human causes, consequences, and responses are understood
 30 with all the richness they deserve. It is not that the so-called human dimen-
 31 sions have been ignored; on the contrary, they have been examined vigor-
 32 ously in parts of the SSH (such as environmental economics) for many years.
 33 The challenge is to widen, diversify, and effectively communicate our under-
 34 standing of these dimensions so that geoscientists and everyone else can
 35 better understand what our planetary malaise could and should mean for us
 36 and for our descendants.

37 Looking at the current relationship between the geosciences and the
 38 environmentally inflected regions of the “people disciplines,” my argument
 39 is simple enough. I suggest that a combination of ignorance, timidity, and

distance conspire to make the geoscience-SSH relationship an anemic one in respect to the causes, symptoms, and effects of global environmental change. For now, at least, the radical implications of global geoscience are not shaking up the conduct of inquiry in the SSH in ways that might rebound formatively on geoscience itself or the wider society. Looking ahead, that needs to change.

Changes to Global Change Science

Climate science is arguably the most globally prominent part of global change science. Since the first United Nations Earth Summit in 1992, its findings about global warming have been the focus of concern, debate, and challenge in government, commerce, and civil society. The Intergovernmental Panel on Climate Change (IPCC), of course, has been central to this effort. Forming a bridge between environmental research and public policy, it has allowed climate scientists to speak in a common voice after careful weighing of voluminous and growing bodies of evidence. But whereas the IPCC is given to communicating in measured language, individual climate scientists are not so constrained. A few, such as James Hansen (2009) and Michael Mann (2014), have spoken out passionately about the dangers posed by runaway greenhouse gas emissions. As Naomi Klein (2014) interprets it, the implications of anthropogenic climate change stand to change everything if taken seriously by those beyond the scientific community.

However, that makes it sound as if speaking truth to power defines the professional role of “concerned climate scientists” without remainder. In other areas of global change science this presumption has been challenged. Though conducting and communicating fundamental research into the functioning of the changing earth system is necessary, some have asked if more can be done. As Nathan Sayre et al. (2013: 339) put it, “Changing the role of [global change] science is necessary but not sufficient to meet the challenges before us—the *practices* of [the] science must also change” (emphasis added). There are three aspects to this change in practices, all predicated on the fact that the end of the Holocene, the risk of crossing critical thresholds, and the transgression of planetary boundaries are (like climate change) all ultimately human questions as much as physical questions.

First, several commentators have noted that for matters of fact about the earth to become facts that matter for people outside geoscience, more careful attention has to be paid to “messaging.” An example is the *Scientific Consensus Statement on Maintaining Humanity’s Life Support Systems in the*

1 *Twenty-First Century*, authored by biologist Anthony Barnosky and colleagues
 2 (see Barnosky et al. 2014a). Released in May 2013, it was targeted at policy
 3 makers—with current California governor Jerry Brown a willing intermedi-
 4 ary to get the statement taken seriously elsewhere in the world of govern-
 5 ment. Unlike the tomes produced by the IPCC working groups and the
 6 lengthy summaries for policy makers they yield, the consensus statement is
 7 an attempt to describe earth system change in a clear, succinct way that deci-
 8 sion makers can understand. The authors then reflected on the success of
 9 the statement in order to distill lessons for other global change scientists in
 10 the future (Barnosky et al. 2014b). Relatedly, Adam Corner and Chris Groves
 11 (2014) argue that new intermediate institutions between geoscience and
 12 society are needed to translate factual matters into the value-based beliefs
 13 that motivate people to act (or not, as the case may be).

14 Second, because environmental change has human causes and conse-
 15 quences, it has been argued that interdisciplinary science is called for that
 16 can incorporate “human dimensions.” In effect, this means understanding
 17 contemporary humans as *part of* the cryosphere, biosphere, hydrosphere,
 18 lithosphere, and atmosphere, not external to them. It entails a recognition
 19 that environmental issues are also issues of human well-being, and vice
 20 versa. Several geoscientists have called for more and better research into
 21 peoples’ thoughts, emotions, and actions so that “coupled” understanding
 22 eventuates, leading to better predictions about risks and remedies. An exam-
 23 ple comes from the pages of *Nature*. There Paul Palmer and Matt Smith
 24 (2014) argued for expanded computer models of climate that build in realis-
 25 tic information about human perceptions and responses as the climate
 26 changes and as people, in turn, continue to affect (and adapt to) the climate.
 27 This argument for change implies more and better interactions between
 28 geoscientists and specialists studying psychology, economics, and so on.

29 Third, several leading geoscientists have called for a turn toward “dec-
 30 sion-relevant” or “actionable” research that can be of use by politicians, busi-
 31 ness leaders, and communities. For instance, Ruth DeFries, Paul Crutzen,
 32 and colleagues envisage research that focuses “proactively on solutions that
 33 are tractable and specific to particular circumstances” (DeFries et al. 2012:
 34 604). Meanwhile, Margaret Palmer (2012) of the National Socio-Environ-
 35 mental Synthesis Center in Maryland calls on researchers to move outside
 36 their comfort zones and coproduce applied knowledge with real-world stake-
 37 holders. Again, these calls for change implicate the people disciplines
 38 because an understanding of society, economy, culture, and politics is
 39 directly relevant to knowing what kind of practical solutions (e.g., technol-
 ogy-led adaptation policies) are likely to “work” on the ground

Though lack of space prevents me from citing more examples, the calls for a new *modus operandi* defined by these three changes are fairly widespread (for a more detailed account, see Castree 2016). In sum, global change science is set to morph, with geoscientists among its number realizing that they need to more fully embed their research in the human dimensions of a planet under pressure. All this has an institutional dimension that should, in time, prove consequential. The new Future Earth initiative (www.futureearth.org/) assimilates three of the four long-standing global change research programs.¹ It has high-level support globally.² Its architects hope to engender “a new type of science that links disciplines, knowledge systems and societal partners to support a more agile global innovation system” (Future Earth 2014: 2). Two of its three overarching research themes are “global development” and “transformations toward sustainability.” The transformations theme evidences a particular wish to make at least some global change researchers agents of significant change outside the universities and institutes they call home. It is very likely that Future Earth will set the tone for many national-level environmental change programs in the immediate future.

Global Change Research, the Social Sciences, and the Humanities

The incipient changes to global change research create clear possibilities for two things to happen. The first is more and broader interaction between geoscience and the environmentally inflected parts of the SSH. The second is greater visibility of these parts outside universities—the sort of visibility that climate science has enjoyed for over twenty years. With both things in mind, I consider below how SSH practitioners have recently responded not only to climate science but also to the epochal claims made by geoscientists located in several specialist fields.

One response has been to consider the significant implications for the established identities and practices of the SSH. Dipesh Chakrabarty’s much-cited *Critical Inquiry* essay “The Climate of History: Four Theses” (2009) provides a fairly well-known example. Reflecting on the discipline of history, he argues that the onset of the Anthropocene unsettles its ontological predicates (such as human history being distinct from earth history). The upshot, he argues, is that studies of the past must be rethought—for instance, histories of human emancipation from poverty and disease since the 1850s must now also be histories of planetary degradation because fossil fuels have been so central to human “development.” Another example is Timothy Clark’s book *Ecocriticism on the Edge* (2015). Ecocriticism involves interpreting

creative works (e.g., novels) that call into question or valorize certain human perceptions and uses of the nonhuman world. Clark argues that the Holocene's eclipse disrupts the normative reference points of the field. That is because ecocritics can no longer presume that what appears environmentally progressive at one spatiotemporal scale will not have regressive impacts at other scales—such are the complex, ramified teleconnections of an earth system undergoing anthropogenic forcing.

A second response has been to advertise the value of SSH fields that have hitherto not been central to the study of “human dimensions.” Consider these two examples that take the form of disciplinary manifestos. Susan Clayton et al. (2015: 644) argue that psychology is “uniquely placed to understand individual- and household-level factors in socio-ecological systems.” They highlight three areas where the discipline can enrich understanding and management of human behavior as climate change escalates. Likewise, Jessica Barnes et al. (2013: 541) note anthropology's marginal role in climate change debates and highlight the value of its “in-depth fieldwork methodology . . . and broad, holistic view of society.” In both examples the authors make the case in a publication outlet read by many geoscientists, the journal *Nature Climate Change*.

A third response has been to continue research into human dimensions that has long been central to the enterprise and also visible to geoscientists, politicians, and others. Environmental economics remains preeminent here. It has been the one area of the SSH that has most shaped societal understandings of the causes of environmental change and feasible solutions. For instance, in two recently published books the British brace of Sir Nicholas Stern (2015) and Dieter Helm (2015) put private property rights, prices, and economic reason at the heart of any “solution” to anthropogenic climate change. In so doing, they extend a stream of thought whose tributaries coalesced back in the early 1980s and animated several carbon trading schemes up to the present. Broadening that stream beyond climate economics, the recent worldwide move toward “payments for ecosystem services” shows that the wider biogeographical domain is now also being routinely subject to economic reasoning. That said, ecological economics is beginning to exert a greater influence in some policy arenas. For example, it is leaving an intellectual imprint on the new Intergovernmental Platform on Biodiversity and Ecosystem Services (which is a sort of twin to the IPCC; see Díaz et al. 2015). Despite being criticized for losing some of its “alternative” credentials (e.g., by Spash 2012), ecological economics' influence suggests that new bodies of thought can sometimes jostle with established approaches to “human dimensions.”

A fourth response has been to explore established themes and questions in the wider SSH in light of the “runaway” human impact on earth. A number of rather “academic” publications within the SSH evidence this response as scholars internalize the “shock of the Anthropocene” (to reference Bonneuil and Fressoz 2016). For instance, writings by literary critic Timothy Morton (2010), geographer Kathryn Yusoff (2015), and sociologist Nigel Clark (2011) explore the implications of the Anthropocene for the cognitive, affective, and moral norms that for decades have governed our self-understanding as Westerners. Each author challenges the descriptive, explanatory, and evaluative repertoire of his or her discipline and points readers toward new intellectual horizons. Meanwhile, Jason Moore (2015) reframes the human dimensions of the Anthropocene as the latest and grandest instance of a long-running phenomenon: capitalism’s war on the earth. Unlike many environmental historians, though, he tries to dispense with the nature-society dualism in his reconstruction of world ecological history since 1500.

A fifth response, not a common one to be sure, is to question the science that is sounding the environmental alarm. Where the previous four responses treat the science uncritically, some in the SSH see it as implicated in the major problems of society, economy, politics, and culture that its findings otherwise place in the spotlight. Take Eileen Crist (2013), writing in the journal *Environmental Humanities*. Far from being objective, she sees the science behind the Anthropocene proposition as suffused with contestable value judgments that scientists are trying to naturalize (wittingly or otherwise). For instance, Will Steffen and colleagues have talked several times about the need for planetary stewardship (see, e.g., Steffen et al. 2011), an “ought” that for them flows from the “fact” of humans’ planetary impact. However, for Crist (2013: 133) they thereby “veer away from environmentalism’s dark idiom of destruction, depredation, rape, loss, devastation . . . and so forth into . . . [a] tame vocabulary that humans are changing [the earth].” As Crist sees it, this bespeaks a short-circuiting of the is-ought link so as to narrow normative reasoning and human response.

The Role of the People Disciplines in Understanding and Affecting the “Age of Humans”

What can we infer from these reactions to climate change science in particular and geoscience more generally? First, it’s clear that certain approaches to understanding people are easier to “sell” as relevant to tackling global environmental change. It is symptomatic that Barnes et al. (2013) advertise a discipline as diverse as anthropology as if it’s an analytical social

1 science that produces actionable data about people as social animals. Its
 2 “soft,” interpretive aspects are underplayed and so too are its idiographic tra-
 3 ditions and associated ideas of cultural diversity (even incommensurability).
 4 Similarly, the sort of critical scholarship Marxists produce on the human
 5 “drivers” of global change (e.g., Moore 2015) is generally invisible to global
 6 change scientists and those outside academia. The continued prominence of
 7 environmental economics, the confident advocacy of behavioral science by
 8 Clayton et al. (2015), and the rarity of alternative approaches (like ecological
 9 economics) in the policy and public mainstream speak to how narrowly
 10 human dimensions are framed.

11 Second, and relatedly, humanists and critical social scientists often
 12 remain content to respond to geoscience at a distance within their estab-
 13 lished disciplinary domains—be it affirmatively (like Chakrabarty, T. Clark,
 14 Morton, Yusoff, N. Clark, and Moore) or critically (like Crist). This distance
 15 allows them to be intellectually creative about the “natural,” the “social,” and
 16 the “human”; equally, it allows them to venture robust judgments of the sci-
 17 ence when necessary. But it also ensures that society, policy, and the under-
 18 pinning science remain unaffected by alternative framings of what global
 19 environmental change is caused by, does (to humans and nonhumans), and
 20 should lead to (in terms of suitable responses). Any citation analysis quickly
 21 reveals that climate scientists, geoscientists, and science-minded members
 22 of the people disciplines (like Stern) scarcely consider critical social science
 23 or the environmental humanities as relevant. Likewise, one rarely sees a crit-
 24 ical social science or humanities “twin” to the likes of Hansen or Mann in
 25 wider debates about the earth and its future. Someone like Australian phi-
 26 losopher Clive Hamilton (2013) is a rarity in this respect.

27 The upshot is that the relationship between scientists studying a fast-
 28 changing planet and social scientists and humanists concerned with the
 29 same thing is both narrow (where potentially strong) and weak (in those
 30 places where breadth would enrich both science and wider understandings
 31 of global change). Why is this? I can think of two reasons, one of which is
 32 fairly obvious. Despite the intellectual differences among the various
 33 branches of geoscience behind a concept like the Anthropocene, there is
 34 nonetheless a prevalent assumption that societies can be analyzed and man-
 35 aged in ways not dissimilar to environmental systems. The earlier men-
 36 tioned article by Palmer and Smith (2014) is one example of this approach,
 37 but there are many others. For instance, in a manifesto arguing for geosci-
 38 ence “with” society rather than simply “about” it, Romain Seidl et al. (2013)
 39 identify the people disciplines salient to that endeavor. “The essential natu-

ral and social science disciplines,” they assert, are “(economic) geography, industrial and regional economics, business and management sciences, industrial ecology, environmental sciences, and regional and economic development planning” (8). Apparently, the humanities are irrelevant. Meanwhile, only those disciplines that presume there is a single reality out there awaiting analysis with the “right” questions, concepts, and methods to hand are cited. As the *Nature* editorial “Time for the Social Sciences” (2015) revealed, the watchword is *integration*: add in explanations and evidence about humans to paint a more complete picture of a world where society and environment bleed into each other ever more. Epistemic unity is here vouchsafed by a presumptive ontological monism.

This sounds as if I am berating geoscientists and a narrow band of environmental social scientists for restricting our understanding of human dimensions. But it is not so simple. On those rare occasions when critical social scientists and humanists have tried to speak about the earth across the “three cultures” divide, they have not been terribly successful so far. Consider the Swedish environmental historian Sverker Sörlin. In 2012 he published a brief manifesto for the environmental humanities in a journal—*BioScience*—largely read by life scientists. That is all to the good . . . and yet: despite arguing for a rich understanding of people’s behavior, he fails—ironically—to define what is specific about the environmental humanities. Meanwhile, when the respected former climate scientist Mike Hulme (2014c) pointed to the limits of physical science on the online news site *The Conversation*, he made it seem as if “human dimensions” are external to the facts and predictions emanating from satellite observation systems and climate models. Though this argument usefully challenges the “one world” presumption that supports the idea of seamless epistemic integration, it also inadvertently perpetuates the myth of value-free science that Crist rightly challenges. Hulme locates the all-important value-based discussions about the world we want inside “society” as if science *itself* is not a thoroughly social enterprise that’s hardwired (in changing and contingent ways) to specific value-based ways of thinking and acting.

Of course, when challenging the image of science as a truth-seeking enterprise that stands above politics, morality, and so on—as Sheila Jasanoff (2014) has done in other contexts—the risk is that scientists switch off. What’s more, it does not help if one makes the case in places or in ways that geoscientists do not register. Take Hulme’s stirring case for the insertion of “virtue” into the conduct of science and any resulting applications, such as geotechnologies. Rather than appearing in a little-read online journal (*Humanities* [Hulme 2014b]) or as a Polity Press book (Hulme 2014a), this

case really needs to be made in a prominent outlet like *Science* and in ways that detail why geoscience should productively utilize its own political dimensions (not shy away from them). Otherwise, it risks being ignored or else misunderstood as an illicit attempt to distort science for extrascientific reasons (recalling the “science wars” in the United States in the 1990s).

The Need for a New Dispensation

I have argued that global change scientists “interpellate” social scientists in specific and circumscribed ways, while assuming that the humanities are largely irrelevant to their research into a changing earth system. I have also argued that critical social scientists and environmental humanists have thus far done a poor job of reaching out to geoscientists or to people outside universities. The result is that the wider debate about the planet and its future remains dominated by a particular set of concepts, metaphors, and values. These reflect a belief, rooted in science, that objectively measureable “problems” can yield appropriate “solutions” once sufficiently “joined-up” research and thorough stakeholder consultation have occurred, allied with cooperation among nations.

There are, in my view, three serious problems with this state of affairs. First, the is-ought relationship is underdetermined. Far from assuming that the earth’s environment can be managed wisely by reforming the current political economy, geoscientists like Rockström and Crutzen could just as well recognize the more radical normative implications of their own science. Presently, the “transformations” theme flagged in the new Future Earth initiative is belied by the political gradualism of global change science. There is a clear reticence to harness science to more revolutionary ends (as, for example, in the 1930s when there was much talk in the West of “socialist science”; see Castree 2015).

Second, and relatedly, when geoscience turns to the quantitative, analytical, and nomothetic parts of social science for help, it actively promotes a specific set of judgments about how we should live on earth as if they are somehow set in stone. For instance, the “market failure” and “tragedy of the commons” arguments of environmental economists focus collective attention on property rights, contracts, and monetary exchanges. Modeling a coupled earth system using this approach to human behavior is all well and good in the eyes of some . . . but only if you don’t want to tackle the deep-seated cultural beliefs and fundamental social relations that, as Klein (2014) argues, enable rampant environmental degradation across the globe.

Third, while scientific facts, predictions, and inventions can speak to more than one political-moral agenda, it's important to recognize that objectivity is a stubborn and unhelpful myth. Geoscientists and science-minded social researchers fool themselves and sell the rest of us short when they pretend otherwise, ignoring decades of empirical work by historians and sociologists of science. What counts as “evidence” and what passes for “relevant knowledge” are necessarily *relative* to the diverse and debatable values and goals that different societies hold dear. These essential “human dimensions” are not merely outside geoscience, something to be studied by SSH specialists on the other side of campus. These dimensions are both inside and directly germane to the conduct of scientific inquiry into a fast-changing earth. The upshot is that geoscience-SSH engagements need to push beyond cognitive issues to encompass ethical and even aesthetic ones (in overt and reflexive ways). Only then will academic knowledge of our planet's present and future be sufficiently plural and value-laden to create real options for public debate and human decision making.

I have had to simplify what is, in fact, a complex story. As I showed earlier, global change science is undergoing change in three respects. Meanwhile, the SSH are responding to the insights of geoscientists in a variety of ways. But, fundamentally, this response amounts to stasis in the guise of a change to professional practices. What is now required is a new means of combining expertise across the “three cultures” divide. Epistemic communities need do so not merely to collaborate but to *unsettle each other* so that a new *modus operandi* emerges. A more inclusive, more multidisciplinary, more dialogical global change research deserves to become influential worldwide. The stakes are high and time is scarce. However, if current arrangements prevail, then an all-too-familiar future awaits us, one in which only knowledge that favors dominant interests gets to shape human self-understanding.

Notes

- 1 These programs are the International Geosphere-Biosphere Program, launched in 1987, which followed the World Climate Research Program, created in 1980; the International Human Dimensions Program, formed in 1990; and Diversitas, launched in 1991 and focusing on global biodiversity and biogeography. After the Amsterdam Declaration by participating members in 2001, the programs were connected through the so-called Earth System Science Partnership (which ended in 2013), and a set of joint projects ensued (see Ignaciuk et al. 2012). Some of the projects roll forward under a Future Earth umbrella, but new ones referenced to the second and third Future Earth themes will start up in the next few years.

- 2 Future Earth is sponsored by the Science and Technology Alliance for Global Sustainability; the International Council of Science (ICSU); the International Social Science Council (ISSC); the Belmont Forum of national funding agencies; the new Sustainable Development Solutions Network; the United Nations Educational, Scientific, and Cultural Organization; the United Nations Environment Program; the United Nations University; and the World Meteorological Organization. Future Earth emerged out of a visioning process sponsored by the ICSU (2010) and the ISSC. It was initiated in 2009 with a “task team” that comprised Johan Rockström, Walter Reid, Heide Hackmann, Khotso Mokhele, Elinor Ostrom, Kari Raivio, Hans Schellnhuber, and Anne Whyte.

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