

# **Energopower: An Introduction**

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## ABSTRACT

*This special collection of Anthropological Quarterly aims to spark new ways of thinking about formations and operations of modern power. Specifically, the articles explore how energetic forces and infrastructures interrelate with institutions and ideations of political power. In the hope of fanning sparks into flames, we juxtapose this process of exploration with the influential paradigm of “biopower” developed by Michel Foucault. All of the essays explore how modalities of “biopower” (the management of life and population) today depend in crucial respects upon modalities of energopower (the harnessing of electricity and fuel) and vice-versa. We emphasize especially the critical importance of exploring the juncture of biopower and energopower in the context of the rising importance of scientific and political discourse on anthropogenic climate change. As human use of energy is increasingly linked to the disruption and destruction of conditions of life (human and otherwise), the tensions between dominant energopolitical systems (like carbon fuel) and biopolitical projects (like sustainability) are increasingly evident, opening new possibilities of anthropological analysis. Both energopower and biopower, we conclude, are entering into a pivotal transitional phase.*

## Returning to the Anthropology of Energy

The articles in this special collection explore the intersection of energetic forces and fuels with projects of governance and self-governance across the world today. To adopt our language here, we are studying the entanglement of “biopower” (the management of life and population) and “energopower” (the harnessing of electricity and fuel). Since biopower will undoubtedly be the more familiar term, I concentrate this introduction on mapping the origins and analytical method of “energopower.” Since “energopower” is a new concept (Boyer 2011), a more extensive definition and discussion is obviously in order. But, first, it is important to position this intervention in the context of previous anthropological engagements with energy. Although a recent flurry of important publications in the “anthropology of energy” (e.g., Behrends et al. 2011, Crate and Nuttall 2009, McNeish and Logan 2012, Nader 2010, Strauss et al. 2013) underscores the field’s contemporary vitality, the fact remains that this is not the first, but rather by our count the third, generation of anthropology’s engagement of energy.

The first generation was defined principally by the work of Leslie White (1949, 1959), a maverick who granted energy a prominent place in his efforts to resurrect evolutionary theory in anthropology. For White, energy was not one research area among others; it was the conceptual key to understanding everything about human life and history. In what is arguably his most influential work, “Energy and the Evolution of Culture,” White outlines a literally universal theory:

Everything in the universe may be described in terms of energy. Galaxies, stars, molecules and atoms may be regarded as organizations of energy. Living organisms may be looked upon as engines which operate by means of energy derived directly or indirectly from the sun. The civilizations or cultures of mankind, also, may be regarded as a form or organization of energy. (1943:335)

White’s key equation was that “cultural development varies directly as the amount of energy per capita per year harnessed and put to work” (1943:338).

At the beginning of cultural history then, with only the energy of its bodies with which to operate, humanity’s cultural development remained at a very low level. To satisfy needs and to improve capabilities, both physical

and intellectual, humanity sought to harness new sources of energy, first in the domestication of animals and plants, increasing “tremendously the amount of energy per capita available for culture-building” (White 1943:343). But after several thousand years of steady improvement, humanity once again plateaued until the advancements of the 18th and 19th centuries allowed for the widespread harnessing of fuel and the invention of engines. Fuel and engines were the technological-cum-sociological basis of modern civilization, White said, and the source of all its great cultural leaps forward from machinery to the arts.

Although in many respects a familiar teleological narrative, White also emphasized a dialectical materialism. Social systems optimized for a given energy regime typically resisted new technologies designed to unleash greater magnitudes of energy. So when “cultural advance” ceased under a given energy regime, “it can be renewed only by tapping some new source of energy and by harnessing it in sufficient magnitude to burst asunder the social system which binds it” (1943:348). Thus, the fuel regime exploded the social apparatus of the agricultural regime in the modernization of society, a story that political economy misrecognized as the struggle between two systems of human production (capitalism and feudalism). White here sows the seeds of an idea that had great, but mostly undeveloped, critical potential: the notion that modern capitalist society was a fuel society to its core; its achievements were fundamentally predicated on fuel consumption such that rampant consumption had become archetypal throughout its culture. Perhaps, White did not pursue the cultural critique because he felt the fuel regime was nearing its end anyway. He wrote of peak oil and peak coal, of dwindling reserves of fuel for a world demanding more and more energy.

A committed but closeted socialist, White doubtless found his energy theory a reassuring rationale for impending revolution. He invoked the Second Law of Thermodynamics frequently in this and later writings to establish a Manichean struggle between the dissipation and concentration of energy in the universe, history, and culture (e.g., “All life is a struggle for free energy” [1987:118]). Life being, in his view, the fundamental struggle to concentrate energy against entropy, it could not cease with the dimming of fuel. Instead, new energies would eventually be harnessed and new social systems and cultural advancements would accrete around them. In the mid-1940s, White sensed an energetic revolution in the making, and he was not alone. In the late 1930s, successful experiments in nuclear

fission set off a great deal of scientific and popular speculation about what a possible several million-fold increase in the energy at humanity's disposal would mean for all aspects of social life (see, e.g., O'Neill 1940, Potter 1940). Then, just months before the publication of White's landmark article, Enrico Fermi and his Manhattan Project team accomplished, although in secret, the first self-sustaining nuclear chain reaction—the pioneering controlled operationalization of nuclear energy that would pave the way towards “the atomic age.” White noted the terrific potentiality of nuclear energy in his famous article: “To be able to harness sub-atomic energy would, without a doubt, create a civilization surpassing sober imagination of today” (1943:351), although he ultimately seemed more attracted to the possibility that the sun would become “directly our chief source of power in the future” (1943:351).

Although prescient in these and other ways, White probably was as much an obstacle to future anthropological research on energy as an inspiration. His politics and personality won him a few friends but many more enemies, enemies who succeeded in isolating him and minimizing his work for many productive years (see Peace 2004). Not only did his universalist model stand in sharp contrast to the Boasian historicism and individualism that dominated American anthropology of the 1940s and 1950s, but White also compounded this contrast with a strident insistence that the evolutionist thinking of figures like Lewis Henry Morgan and Edward B. Tylor was more coherent than and theoretically superior to the work of Boas. It was many years before some rapprochement could be found between White and the Boasians, by which time other less controversial figures like Julian Steward, Marshall Sahlins, and Elman Service had become more central to the movement that had come to be known as “cultural materialism,” pushing White's thermodynamic and energetic focus deep into the shadows of mainstream social-cultural anthropology.

There is thus less of a lineage than one might expect between the first generation of anthropological interest in energy and the second generation, which emerged in the 1970s and 1980s. Some Whitean influence remained, particularly through the networks of Michigan anthropology (see, e.g., Adams 1975, Rappaport 1975), but there were concerns as to how to develop White's energy theory further. In his 1977 Presidential Address to the American Anthropological Association, Richard Adams recalled his tutelage under White and the problems that arose from importing physical and chemical conceptualizations of energy into social analysis:

Basically, we relied on the first and second laws of thermodynamics and followed the example of community ecologists. But the fact that the second law was applicable only to closed systems posed substantial barriers to its use in analyzing human societies. They were, after all, clearly open systems. I think the dilatory development of energy study in social anthropology is in part the result of an inadequate theoretical basis provided by physics and chemistry. (1978:298)

Adams did not view this problem as insurmountable, seeing great promise, for example, in the chemist Ilya Prigogine's "foundation for an understanding of thermodynamic open systems" (1978:302), but he noted that the road ahead required a shift to the "holistic study of larger societies" (1978:301) for which, in his judgment, anthropological theory was as yet poorly equipped. Adams' address ended with a rousing and once again prescient call for anthropologists to take a more active role in the critical investigation of the magnitudes and sources of energy flow with an ultimate aim "to develop more direct dependence on solar energy and to reduce both the use of nonrenewable energy forms and the derangement of the natural ecological processes that construct the energy forms we need for our own nutrition and that of other species" (1978:307).

Yet, by and large, this call was not taken up immediately. Second generation anthropologists of energy typically did stand in a critical relationship to the energy forms and norms of the developed world. But they were significantly less interested in advancing energetic and thermodynamic cultural theory than they were interested in highlighting the cultural and social impacts of energy development for indigenous peoples (Nordstrom et al. 1977), especially in terms of nuclear power (Robbins 1980), uranium mining (Robbins 1984), and oil extraction (Kruse et al. 1982, Jorgensen 1990). The second generation thus drew energy into wider debates over the rights of indigenous communities, environmental impacts, and resource exploitation, debates that remain central features of the anthropology of energy today (e.g., Barker 1997, Love and Garwood 2011, Powell and Long 2010, Sawyer 2004, Sawyer and Gomez 2012). But, much as Adams feared, the mainstream discipline's interest in the topic of energy remained "dilatory." The AAA flagship journal, *American Anthropologist*, for example, published scarcely any energy-related research after the mid-1970s (see, however, Whitehead 1987). In part, this gap can be attributed to the "applied" character of many second generation projects

that were designed foremost to help improve relationships among indigenous groups, corporations, and governments as regarded energy development (see, e.g., Jorgensen et al. 1978, Jorgensen 1984). But it also expressed the sense of theoretical impasse to which Adams had alluded as well as the progressive retreat from anthropological holism that was occasioned by the growing subspecialization of anthropological research and the waning capacity of the subfields to communicate and collaborate effectively with each other.

An important exception to this trend was the work of Laura Nader (1980, 1981), whose participation in the late 1970s in the US National Academy of Science's Committee on Nuclear and Alternative Energy Systems (CONAES) served as an inspiration to Adams as to what anthropologists might be capable of accomplishing (Adams 1978:307). Through her research on behalf of CONAES, Nader became interested in the contribution of worldviews, both popular and scientific, to the rejection of ideas of energy conservation and energy transition (Nader and Beckerman 1978). As the first anthropologist to research the energy policy community and energy scientists, Nader became both fascinated and deeply disturbed by "the culture of energy experts" (2004:775). She saw energy policy as "grounded in fear of deleterious change in life-styles and options" despite considerable evidence of "the very wide range of choices of life-styles that is available in any plausible energy future" (2010:241). Energy science meanwhile was plagued by an "inevitability syndrome" (2004:775) that resisted models not predicated upon ever-increasing resource use and energy expenditure:

Also striking was the omnipresent model of unilinear development (a concept that anthropologists had left in the dust decades earlier), with little general understanding of macro-processes. For example, the recognition that civilizations arise but that they also collapse was missing from the thinking about the present. Prevalent was the nineteenth century belief that technological progress was equivalent to social progress. In such a progressivist frame science too could only rise and not fall or wane. Furthermore, the possibility that experts might be part of the problem was novel to the expert who thought that he stood outside of the problem. (2004:776)

Nader ended up laying much blame at the foot of the specialization and hierarchization of scientific communities in which “standardization and conformity” ruled the roost and prevented much needed creative thinking about energy futures (2004:776). Among anthropologists, Nader remains the only scholar to have researched the expert imagination of energy futures in such depth. Her work also paved the way for more recent ethnographies of energy experts (Mason and Stoilkova 2012) and for political anthropologies of carbon (Coronil 1997) and nuclear (Gusterson 1998, Masco 2006) statecraft.

If there is a lesson to be drawn from the timing of the first two generations of anthropological attention to energy, it is that they have accompanied vulnerable or transitional moments in dominant regimes of energopower. In White’s case, his positioning of energy as the key to understanding all human culture (and indeed all existence) accompanied the nuclear energy revolution and its new magnitudes of creative and destructive power. In the case of the second generation, the context was what Nader termed “the energy decade” of the 1970s. The oil shocks of 1973 signaled the end of a certain phase of northern imperial control over carbon fuel (discussed below in more detail). A short-lived political willingness to explore alternative energy sources followed, helping to generate energopolitical fissures and tremors that attracted anthropological attention. The political recommitment to carbon and nuclear energy across the industrialized world in the 1980s blunted the aspirations and urgency of energy research in anthropology as elsewhere in the human sciences. Indeed, between the mid-1980s and the mid-2000s, anthropological research on energy seemed to go into a kind of hiatus (see, however, Traweek 1988, Dawson 1992, Coronil 1997), before displaying signs of renaissance (Henning 2005, Love 2008, Mason 2007, Sawyer 2004, Strauss and Orlove 2003, Wilhite 2005). Over the past several years, a mounting body of intriguing case studies has begun to generate more profound theoretical challenges (e.g., Reyna and Behrends 2008, Sawyer 2007, Winther 2008) including, we modestly hope, the rethinking of political power through energetic power that is the subject of this special collection.

But if earlier iterations of the anthropology of energy clustered around moments of energopolitical change, then it is worth reflecting further on what is occurring now that helps to explain the recent and quite rapid accumulation of disciplinary interest in energy. Some 70 years after White’s

landmark paper, it seems as though energy has at long last become a subject worthy of serious attention in social-cultural anthropology. So, why now?

### **Inspirations: The Anthropocene and the “Anti-Anthropocentric” Turn**

The reasons for the recent (re)turn to energy are doubtless several. We should take note, first of all, that the return is occurring across the human sciences. In the last decade, we have witnessed an intensification of research and conversation around many different aspects and consequences of energy use: for example, the ethical considerations of climate change (Chakrabarty 2009; Jamieson 2001, 2011), the formation of climatological expertise (Edwards 2010, Parker 2010), entanglements of carbon fuels and political power (Klieman 2008, Mitchell 2009, Kashi 2008), sustainable and low carbon urban designs (Davis 2010, Wheeler and Beatley 2004), the potentialities of ecological theory (Morton 2010, Taylor 2009), fuel’s presence in literature and the arts (Pinkus 2008, *PMLA* 2011, Wenzel 2006), and critical investigations of “petroculture” in its broadest sense (Szeman 2007, 2013), among many other topics. The seemingly spontaneous and uncoordinated eruption of kindred problematics and analytics across the human sciences suggests that a deeper perhaps even epochal transformation of commitments has begun. As Dipesh Chakrabarty has put it elegantly, “anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction between natural history and human history” (2009:201). And this collapse has spread well beyond history to challenge the epistemologies of other humanities and humanistic social sciences as well.

One can readily agree with Chakrabarty that the sense of urgency surrounding energy research today connects closely to how anthropogenic climate change and the necessity of energy transitions have become increasingly potent features of scientific and political truth (e.g., Oreskes 2004, United Nations 1992). Over the past two decades, public cultural commentary on signs and implications of climate change has boomed. One should not underestimate, for example, the impact of films like *An Inconvenient Truth* (2006) in animating popular imagination of not only impending global calamity but also of possibilities of change and remediation. Even taking into account the works of an active and well-financed

industry of climate change skeptics (Boykoff 2011), the mediation of extreme weather and pollution events has become so commonplace that “facticity” of the Anthropocene is becoming an increasingly secure feature of everyday knowledge.

At the same time, one hopes it is obvious that the Anthropocene is more than a discursive phenomenon. However one stands on the truth and accuracy of news representations, evidence of the ecological effects of human use of energy is mounting from new patterns and intensities of temperature, drought, and rainfall across the world to the poison skies of Beijing and the toxic soils of Fukushima. It has been an eye-opening experience to hear rural farmers and ranchers in remote parts of southern Mexico speak of *cambio climatico* as though it were an obvious environmental condition. But, as we have seen in the excruciating serial failures of the UNCCC (United Nations Convention on Climate Change) to limit carbon emissions on a planetary scale, empirical obviousness is no guarantee of serious political attention, let alone action. A panel set up by the UN in 2012 to evaluate its Clean Development Mechanism and the carbon market meant to rein in global emissions concluded that the system had “essentially collapsed” (Clark 2013) with the right to pollute now being so cheap as to offer no disincentive whatsoever. To return to White’s glimpse of modernity’s carbon core, it may well be the case that trying to fight overheated consumption with consumption-oriented remedies like “carbon markets” risks reinforcing rather than rupturing problematic modes of thought and action.

The sense of urgency intensifies with each “super storm,” record-setting heat wave, and endless drought. Apocalyptic imaginaries swirl in the wake of political impasse; the well-founded fear of nuclear winter that I grew up with in late Cold War America has now mutated into nightmares of flooding, burning anthropogenic summer, threatening equivalently to be humanity’s last season. These visions are symptomatic of the third generation’s energopolitical rupture, parallel to the birth of nuclear energy in the 1940s and to the carbon imperial crisis of the 1970s. Today, we try to navigate the rising waters of certainty that our current course of intensive carbon and nuclear energy use combined with exponential human population growth will lead to unprecedented miseries for human and nonhuman life and probable civilizational collapse. All the modern promises of endless growth, wealth, health, and productive control over “nature” now appear increasingly deluded and bankrupt, designs for Malthusian tragedy.

The crisis may be showing up on the public radar only now, but we have been feeling the ache for decades. Before energy burst onto the scene again, we were already sensing a powerful dis-ease within modernity. In academic life, that sensibility manifested, for example, in a series of conceptual turns in the human sciences that for lack of a less ugly term, I will call “anti-anthropocentric.”<sup>1</sup> First, just at the moment that the dominant energopolitics was recalibrating itself to the rise of OPEC, science and technology studies began to come of age, exploring the contingencies of the production of expert knowledge across space, society, and time. Figures such as Michel Callon (1986) and Bruno Latour emerged as early prophets of the bankruptcy of modern nature/culture oppositions (1993) and of the “actancy” of objects and materials (1988). The parallel rise of Foucauldian analysis of power/knowledge (e.g., 1979) further underscored a lost faith in modern expertise and the rejection of the technocratic imaginaries that had seemed so robust until the oil shocks changed everything.

Subsequently, posthumanism (e.g., Haraway 1991) challenged the human empire over other forms of life, especially human species-ism and the careless manipulation of companion species and companion materials. In the past decade, we have seen a marvelous array of new conceptual movements working through the implications of banners such as “new materialism,” “objected oriented ontology,” “new realism,” “speculative realism,” and so on (see, e.g., Bennett 2010, de Landa 2002, Harman 2002, Meillasoux 2008). Such thinking is far from homogeneous. But they have a family resemblance to one another as collaborators in extending non-anthropocentric reasoning in the human sciences. Although concept work typically believes itself undetermined by its socio-environmental circumstances of origin, one cannot help but find the timing of these movements uncanny. They are all taking shape in the deepening shadow of the Anthropocene and intensifying public discourse on environmental degradation and disaster. Whatever more specific intellectual agendas they are pursuing, all of them index the problematic legacies of human-centered thinking and action. And thus, in more or less remote fashion, I believe they offer commentaries on carbon modernity’s accelerating death-bringing in the name of enfueling human life.

The anti-anthropocentric turn in the human sciences should not be underestimated in its inspiration and reinforcement of third generation energy research in anthropology. But it has more and less constructive

interventions in my opinion. Posthumanism, for example, is a laudable ethical project both inside and outside the academy. As Timothy Morton has put it, under our contemporary circumstances of ecological risk and decline, there is an obvious need to “change our view from anthropocentrism to ecocentrism” (2007:2). We must force ourselves to confront to what extent our contemporary understanding of “the human” has been achieved “by escaping or repressing not just its animal origins in nature, the biological, and the evolutionary, but more generally by transcending the bonds of materiality and embodiment altogether” (Wolfe 2010:xv). The message here is the necessity of constituting new worldviews and modes of action appropriate to the recognition of ecological interdependency and interresponsibility. In a way, posthumanist ethics complement well the aspiration toward macrostructural “sustainability” in contemporary modernity, the attempt to achieve a (as yet fantastic) modernity that can retain its pleasures and powers without a constant demand for increasing its intensities and magnitudes. Such a project seems entirely salutary.

However, I find much less useful the onslaught of criticism against Kantianism and the phenomenological tradition. There has been an unfortunate tendency in the anti-anthropocentric turn, stoked no doubt by its revolutionary fervor, to dismiss enduring inquiry into human reason and agency as though that inquiry were itself somehow part of the problem rather than a complementary project of truth-finding or, better still, part of the solution to our contemporary challenges. Ian Bogost writes, for example, that “the speculative realists share a common position less than they do a common enemy: the tradition of human access that seeps from the rot of Kant” (2012:4). This seems to me misdirected rancor, both forgetting Kant’s own critique of anthropocentrism and overestimating philosophy’s capacity to orchestrate ideas, culture, and behavior in the world around it. The Anthropocene is, anyway, a peculiar time in which to become animated by an ideological project of denigrating the significance of human understanding and agency relative to the actancy of objects and materials. It is a bit like the Hegelian master cat toying with its dying prey, trying to resuscitate a tortured object into a subject worthy of domination. In other words, we cannot forget that the postwar period has seen several quantum leaps in “human” intervention into “nature” (synthetic biology, nuclear weaponry, anthropogenic climate change, to name a few of the more obvious). We might wonder about the stakes of theoretically rebalancing the relative powers of agency and actancy under these conditions.

Is the more pressing need not to acknowledge the new magnitudes of agency and demand responsibility for them?

The impatient dismissal of the Kantian tradition (which includes heterodox critics from Hegel to Marx, Freud, Nietzsche, and Foucault) of questioning categories and practices of knowledge is thus unhelpful in that it, whether intentionally or not, deflects a species-specific mediating responsibility for the current state of the planet into arguments over whether we “have ever been modern” (Latour 1993) from an ontological standpoint. But, the ultimate ontological status of human agency seems less relevant than the problem of *accountability* for the fact that we have been *acting* as though we have been modern for a long time. “Logically, then,” Chakrabarty writes, “in the era of the Anthropocene, we need the Enlightenment (that is, reason) even more than in the past” (2009:211). I concur on the condition that whatever reason comes next must also incorporate the positive fruits of anti-anthropocentric thinking, namely its deep criticism of how humanity (and, in particular, northern humanity), through its modernist fantasies of command and control over something called “nature,” generated new conditions of contingency and vulnerability for the planetary ecology. In other words, if Enlightenment can accelerate the process of taking responsibility for the Anthropocene, then I am all for it. If not, frankly, it will amount to little more than the various distractions and delay tactics already being exercised within carbon energopower.

In this respect, I surely reveal my disciplinary as well as personal sympathies. The anti-anthropocentric turn places anthropology in a somewhat awkward situation. Anthropology’s craft (as a fieldwork based social science focusing on humanity) has traditionally been highly anthropocentric even as it has certainly never been uninterested in matters of materiality, ontology, and the nonhuman (see, e.g., Ingold 2011). Even though it is factual that movements like science and technology studies have exercised a massive impact upon anthropological research over the past two decades, the epistemic core of anthropology remains stubbornly “Kantian” in its praxiological, semiological, and phenomenological attentions to human experience. This is, to repeat, a good thing—in my view, responding to the Anthropocene requires all of these analytical traditions for their expertise in modeling human understanding and behavior. Still, there is now more so than ever a generative discussion, also a good thing, about the limits of anthropocentrism in anthropology. Our latest ensemble of trends mirror those of the human sciences more generally: neomaterialism,

multispecies inquiry, a deepening interest in ontology, to name a few. As Hoon Song presciently remarked to me several years ago, “everyone’s going Deleuzian,” gesturing to the new analytic sensibility taking shape in anthropology. Thinking with Spinoza, Deleuze became fascinated by a matrix of cryptoenergetic forces and flows that Brian Massumi has termed “ontopower.”<sup>2</sup> This ontopower resembles Foucault’s sense of power in certain respects, but it moves beyond his still Kantian interest in discourse and truth. Ontopower is not an epistemic mediator; it is said to be a real force that flows through us, primes us, shocks us, composes us, relates us nominal human beings with the diverse elements of our equivalently ontopowered environments. So, even if we have maybe not all “gone Deleuzian,” the discipline’s current fascination with Deleuze-inspired topics like affect (see, e.g., Stewart 2008) suggests that to do anthropology today means to be attentive to matters of force, flow, matter, and charge alongside its more traditional coordinates. The competition of Kantian and post-Kantian impetus that typifies anthropological theory today colors our effort to develop an energopolitical analysis commensurate with dominant strategies of biopolitical analysis.

### **Surfacing Energopolitics in a Biopolitical Era**

For the moment, the analytics of political power in anthropology today closely align with Foucault’s concept of “biopower” (Foucault 1978, 2002).<sup>3</sup> But the concept itself is somewhat diffuse. In an important article by Rabinow and Rose (2006:199), we learn that Foucault’s own conceptual work on biopower was both incomplete and historically specific, that is, a way of denoting the gradual conjoining of two force clusters during the 18th and 19th centuries in Europe. The first force cluster was the anatomo-politics of the human body, “seeking to maximize its forces and integrate it into efficient systems” while the second was “one of regulatory controls, a biopolitics of the population, focusing on the species body, the body imbued with the mechanisms of life: birth, morbidity, mortality, longevity” (2006:196). Rabinow and Rose themselves suggest a more precise and generalizable formulation of “biopolitics” as “the specific strategies and contestations over problematizations of collective human vitality, morbidity and mortality; over the forms of knowledge, regimes of authority, and practices of intervention that are desirable, legitimate and efficacious” (2006:197). One notes immediately that this formulation, like

Foucault's original, contains a certain anthropocentrism, although by no means a programmatic one. Biopower and biopolitics mark a domain of power that specifically concerns the management and control of *human* vitality. Rabinow and Rose, and many other anthropologists besides (e.g., Briggs and Nichter 2009, Fassin 2001, Greenhalgh and Winckler 2005, Petryna 2002), have effectively retooled the biopower concept for 20th and 21st century conditions by bringing together the sciences, politics, and economies of life (where "life" itself involves issues as far-ranging as sexuality, reproduction, genomics, population, care of the self, and so on).

Still, life in the Foucauldian analytical imagination (much as in the governmental biopolitics it is modeling) clearly centers on human life. This close anchorage to "the human," even as it denies the authoritative overtures of "humanism," is, I strongly suspect, one reason why the concept has proven so useful in the discipline of anthropology in a time of transition, as a way of modeling power in the nascent "posthuman" era. Yet, given the epistemic and experiential challenges raised by the Anthropocene, "biopower" is clearly conceptually ripe for further reexamination, specifically as to whether its anthropocentrism is adequate to the analytics of the contemporary. Foucault, I think, would approve in that his genealogical method was not designed to inquire into timeless conditions that endure throughout history, but rather to examine "the constitution of the subject across history" (Foucault 1993:202). That is to say, if biopower has become one of our most potent keywords for analyzing political power today, it seems appropriate in the original spirit of Foucault's articulation to subvert it through new genealogical exercises lest we come to believe that "biopower" denotes a transhistorical dimension of modern power and subjectivity.

Our exploration of "energopower" in this special collection is precisely such an exercise of respectful subversion. Biopower continues to capture many of the most salient features of political power today, especially interventions of expertise and authority concerning health, security, and population. But the Anthropocene is challenging contemporary biopower to think beyond narrowly anthropocentric models of intervention and remediation. At the same time, the shockwaves affecting carbon and nuclear energy (from peak oil hypotheses to very real environmental toxicities and nuclear tragedies) have shaken the foundations of the contemporary biopolitical regime in such a way that we find fissures opening and fuel, in some cases quite literally, flowing into the groundwater of bios.

The concepts of energopower and energopolitics are children of this rupture, ways of putting into words the increasing recognition that conditions of life today are increasingly and unstably intertwined with particular infrastructures, magnitudes, and habits of using electricity and fuel. Timothy Mitchell's (2009, 2011) "Carbon Democracy" project has been pathbreaking in this respect. Mitchell, no stranger to biopolitical analysis himself, digs deeply into the history of carbon energy to surface the dependency of modern democratic power upon carbon energy systems; first coal, later oil, and now perhaps we are witnessing a third carbon revolution looming with natural gas and "unconventional" hydrocarbons like tar sands. What Reza Negarestani (2008) imagines as a black or rotting sun within the earth has crucially supplied the intensities of power for modern life and governance and, through these dependencies, has subtly shaped the trajectory and forms of modern political power. Mitchell (2009:407) shows, for example, how the consolidation of social democracy in the late 19th century crucially depended on the materialities and infrastructures of coal that allowed miners to choke political power until it acceded to labor reforms. He explains how the biopolitical norms of 20th century Keynesian welfarism were authorized by a regime of expertise concerning oil as an inexhaustible resource capable of fueling the endless growth of national economies. But he also shows how that understanding of oil was enabled in turn by a geopolitics of neoimperial control over the Middle East and its subsoil resources (Mitchell 2011:173fn). Once that control was ruptured with the formation of OPEC and the oil shocks of the 1970s, the magic of Keynesian biopolitical thinking was disrupted. "Growth" declined radically across the Global North and different powers of life exploited this crisis to rise to dominance, the politics we normally gloss as "neoliberal."

Mitchell's is an excellent example of energopolitical analysis in action. My second example is drawn from current field research in Mexico (see also Howe this issue). Mexico's state of crisis has become a routine feature of international news media coverage over the past several years. Usually this crisis is presented, in essence, as the biopolitical crisis of a war on drugs gone bad, spawning war machines across the country, perversely devouring life in the name of preserving it. Yet, there is another less publicized crisis in Mexico, the energetic crisis of a steep decline in petroleum production (over 25 percent in the past seven years) by the giant parastatal Pemex. Mexico is a petrostate par excellence in that Pemex's profits have supplied as much as 40 percent of the operating revenue of

the Mexican federal government in recent years, meaning that every aspect of Mexican biopower also depends critically on the now fading light of the black sun. In the state of Oaxaca, Cymene Howe and I have been studying the attempt to capture a powerful but elusive new energy form, the winds of the Isthmus of Tehuantepec.

Those winds are literally a force to be reckoned with. When *El Norte* blows strongest in the winter months, with routinely tropical storm-like intensity, its 110-120 km/h winds can easily blow over tractor trailers and mangle turbines designed for less fierce and turbulent air. Transnational energy companies are enchanted by the vision of harnessing this perfect storm of energy and by Mexico's high electricity tariffs, which guarantee profits as strong and steady as the wind itself. But, alas, these winds blow across land, much of it organized under the collective stewardship of indigenous *binnizá* (Zapotec) and *ikojts* (Huave) communities, where the political climate is no less fierce. For centuries, the Isthmus has prided itself on negating international, national, and regional projects of control over its people and resources. In response, the area has come to be regarded as a dangerous and murky margin to the exercise of legitimate political authority. The Istmeños are known in Oaxaca City and Mexico City for their ignorance and poverty, for their inclination toward violence, for their manipulation by corrupt political bosses who ritually practice a *liderazgo* (leadership) of impeding state development projects until blackmail demands are satisfied. The managing editor of one of Oaxaca's largest newspapers lamented to us, "we have the most blockades and occupations of any Mexican state but also the fewest schools and the most poverty."

Still, the lure of the wind, "the most perfect jewel" as one government official described it, is too great to give up. Numerous representatives of the federal and regional levels of the state have assured us that wind development is biopolitical, a project to jolt this poor and highly indigenous region into a state of modernizing "progress." And, yet in the first several years of serious wind development, we have found that the installation and exercise of institutional biopower (schools, medicine, even factories and prisons) has been little more than an afterthought. Instead, the dominant politics are the politics of transnational investment, grid extension, and electricity provision, a politics that is being orchestrated by another parastatal CFE, the electricity utility, whose biopolitical imagination is rudimentary to say the least. In Ixtepec—known locally as *Tristetepec* for its lack of employment opportunities—there is a plan now to build the

first community-owned wind park in Latin America. The Ixtepecan *comuneros* want, above all, funds for social development and sustainable progress, and to become a beacon for community-owned energy in the Western Hemisphere. But neither the government nor the utility supports them—renewable energy is costly and complicated in terms of current grid technology and communities cannot be forced to pay for infrastructural improvements like new substations and grid extensions in the way that transnational corporations can. CFE, as a “para-state,” has thus literally taken it upon itself to overwrite sections of the Mexican constitution and tender law to prevent the community park from happening. As one of the leaders of the community park project growled, “CFE is strong but they are also working against the interests of the Mexican people.” In the overlapping of neoliberal and neocolonial modes of abandonment that Mexico knows all too well, biopower in southern Mexico is, for good or for ill, an often forgotten partner in the transactions between old and new regimes of energopower.

### **Defining Energopower**

Another lesson learned from Foucault is that it is sometimes better to offer a provocative placeholder than a definite statement, some rolls of intriguing fabric rather than a dazzling corset. We wish to lure imaginative designers to our workbench. In this spirit, I would describe energopower as an alternative genealogy of modern power, as an analytic method that looks in the walls to find the wiring and ducts and insulation, that listens to the streets to hear the murmur of pipes and sewage, that regards discourse on energy security today as not simply about the management of population (e.g., “biosecurity”) but also about the concern that our precious and invisible conduits of fuel and force stay brimming and humming. *Above all, energopower is a genealogy of modern power that rethinks political power through the twin analytics of electricity and fuel. Energeia*, for Aristotle, was being-at-work. In modern physics, power is the rate at which energy is transferred, used, or transformed. We thus regard energopower as a discourse and truth phenomenon to be sure, but as one that searches out signals of the energo-material transferences and transformations incorporated in all other sociopolitical phenomena.

I would reiterate that our intention is *not*, in the tradition of Leslie White, simply to import the truth propositions of physical science into

anthropology. Anthropology's unique strengths as a discipline do not lie (solely) in ontology as I have argued above; we may search for truths of an ontological kind, but we cannot ignore the many pathways of mediation that are involved in such truths' processes of epistemic formation and sedimentation. Energopower is thus a concept designed to bridge discourse, materiality, and history—we feel that the concept, and the multiattentive method (Boyer 2010) that informs the concept, will help undermine impasses among the analytics of modernity and power that come to us through the Marxian and Foucauldian traditions and through more recent iterations of the anti-anthropocentric turn.

But let us anticipate the objection that energopower is ultimately just another modality of biopower. In other words, could all this talk of grids, fuels, and forces simply be mistaking the instruments of biopolitics for the agents of energopolitics? Personally, I agree with Doug Rogers (this issue) that the either/or character of that challenge is not particularly fruitful. Our intervention here is rather of the “both/and” variety. We are not proposing that energopower displace biopower in anthropological theory of power anymore than we believe that energopower is a footnote to biopower. Both energopower and biopower offer analytics of modern power lenses through which to comprehend the organization and dynamics of political forces across different scales. Although it is very tempting to make an ontological or historical argument for one kind of power exerting determinative causal force over the other, that is not our mission here. Energopower is not a “kind of power,” after all, but rather the conceptual lens for an analytical method of understanding power. Neither Foucault's biopower nor energopower can pretend to model the absolute truth of power because whose truth would that be? As anthropologists, for better or for worse, the profound multiplicity of human languages, knowledges, institutions, and experiences remains the muse and medium of our intellectual practice.

This argument for recognizing energopower is therefore phenomenological, or if you will Hegelian-Marxian, rather than ontological, since it accepts the mediation of cultural-historical experience in the making of epistemic categories and analytic concepts. Foucault located the origins of “biopower” in early modern Europe, but the concept itself was deeply imprinted by the Keynesian welfarism of his time. Likewise, “energopower” is a concept that makes sense now because of a series of events that have drawn our attention to tensions, contradictions even, between

governmental institutions and aspirations and energetic forces and fuels. Events such as the oil shocks of the 1970s or the more recent recognition of the Anthropocene help us to see new dimensions of power. But that does not mean that they trivialize the dimensions of power we have already recognized nor that these new insights somehow complete our understanding of power.

Because “power” is itself a shifter, a category of volatile reference, the “power” in biopower is *pouvoir*—which in its modal form means only the ability to do something, enablement, forces that allow other forces to happen. Following this logic, it would be impossible to say where the power of energy ends and that of life begins. Put in more concrete terms, the instrumentalities and truth discourses of a modern hospital or school would have little extensional force without electrification, without discourses of endless safe clean power, without highly energy-intensive building materials like cement that literally provide the foundations for biopolitical edifices. In other words, there could have been no consolidation of any regime of modern biopower without a parallel securitization of energy provision and synchronization of energy discourse. In this respect, biopower has always plugged in.

But likewise energopower has always been shaped by particular forms and politics of life. Fuel and electricity, needless to say, are institutionalized with biopolitical missions like “development” (see, e.g., Winther 2008). Biopower and energopower should thus not be viewed as oppositional. What we are exploring in this special collection is the interdependency, or at least the entanglement, of energopolitical and biopolitical regimes across the contemporary world from petroculture in Russia (Rogers this issue) to renewable energy in Mexico (Howe this issue), to waste management (Alexander and Reno this issue) and low carbon (Knox this issue) projects in the United Kingdom, to the experimental urban future of Masdar City in the United Arab Emirates (Günel this issue). In these cases, we see how the promises of Keynesian and neoliberal biopolitics (ever more freedom, ever more luxury, ever more use valuable goods and consumption opportunities) are straining the planet’s eco-environmental nexus in ways that rupture not only the image of neoliberal autology but also the image of a self-governing biopower. We encounter more signs of how the dominant carbon energopolitical regime is increasingly disrupting and poisoning life across the world. But at the same time, we glimpse fascinating new mutations in that regime’s discourse and techniques of

governance with the appearance of new anthropocentric and ecocentric biopolitical imaginaries responding to climate change. Energopolitical crisis is generating biopolitical effects and vice-versa.

### **Conclusion: Transitions and Futures**

This is, true to our final theme, a time of transitions. If, as Mitchell teaches us, the postwar period and its promises of endless growth were defined above all by a remarkable integration of energetic systems (transnational oil and nuclear energy) and biopolitical order (Keynesian welfarism), then since the 1970s the world has experienced an accelerating process of dis-integration in which the seams between bios and energos are increasingly taut and visible. What comes next is abundantly unclear. A potential for revolutionary transition is there as the renewable energy visionary and German politician Hermann Scheer (2004, 2005) asserted forcefully. Scheer argued not only against carbon and nuclear fuel, but also against the long, inefficient supply chains materially intrinsic to carbon and nuclear energy systems. These lend political authority a centralized energetic infrastructure through which to oppress and ignore communities and individuals. Instead, Scheer imagined a future of decentralized renewable energy supply, which would create an unprecedented transformation of modern life and power. Imagine, Scheer mused, if we could truly harness the power of the yellow sun, maintaining all the pleasures and potentialities of energy-intensive modernity without a grid, without pipelines, without carbon emissions. “[O]nly a solar global economy can satisfy the material needs of all mankind and grant us the freedom to re-establish our social and democratic ideals” (2004:32). The solar economy, he promised, would generate new political possibilities by freeing citizenship from centralized, grid-based authority.

Scheer’s voice still sounds like a cry in the wilderness. Mainstream media and public culture tend to resist the idea of revolutionary change for good or ill. There, the black sun still oozes, consigning post-carbon energopower and biopower to the realm of heliocentric fantasy. Natural gas and shale oil are instead said to be our true saviors; the US will become the next Saudi Arabia; carbon capture and geoengineering will protect us from global warming; and so on. This is, to reiterate, not only a fascinating moment in which to return to the anthropology of energy, it is a moment of supreme political and cultural urgency and opportunity. Anthropology

has long excelled in gathering and analyzing epistemic signals from elsewhere. What we advocate here is that that “elsewhere” be reconsidered not only as encompassing other places, cultures, and times but also the signals of force and fuel surrounding us in the here and now, the humming of enablement. And for those of us who wish not only to analyze the world but also to change it, we can take heart in one thing: alternatives to the anthropocentric status quo are emerging abundantly in the human imagination if not yet in human institutions. The articles here have much to say not only about the limits and dead-ends of thinking about energy today; they also offer a great many moments of inspiration in the many minds and hands—whether in the dust and wind of Álvaro Obregón or in the labs of Manchester and Masdar—where new alignments of life and energy are being brought into focus and form. ■

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#### Endnotes:

<sup>1</sup>There are a large series of glosses that capture more specific aspects of this turn such as, for example, “ontological,” “neomaterialist,” “post-constructivist,” “post-Kantian,” and “anti-correlationist.” A major recent conference clustered several of the philosophical and theoretical trends I cite here as a “nonhuman turn” (Center for 21st Century Studies 2012, see <http://www.c21uwm.com/nonhumanturn/>). While all these adjectives capture certain elements of contemporary debate and discourse very well, I find “anti-anthropocentric” the more compellingly accurate term at the level of the human sciences. For one thing, these literatures share more strongly in a critical project than in any positive project. Many fall well short, for example, of articulating positive biocentric or ecocentric positions. Also, their conceptual and thematic stakes vary: some grapple with metaphysical questions of ontology and materiality, others concentrate on the rights and politics of biotic nonhumanity, still others explore the possibility of “eco-phenomenology.” Where they intersect is in the rejection of intellectual traditions that manifestly or latently assume human superiority or centrality as a pillar of their epistemic practice.

<sup>2</sup>Massumi has stated, for example, “How can ‘we’ master what forms us? And reforms us at each instant, before we know it? But that is not to say that we’re impotent before ontopower. Quite the contrary, our lives are capacitated by it. We live it; the power of existence that we express it” (as quoted in McKim 2009:11).

<sup>3</sup>There will undoubtedly be those who wish to contest this characterization. I do not mean to diminish in any way the importance, for example, of Marxian models of power, which have been resilient in anthropology and which are clearly resurgent in the past few years as well. Rather, I mean to suggest that Foucault’s work has served as an especially intuitive and generative theoretical resource for conceptualizing power in ethnographic contexts.

**References:**

- Adams, Richard Newbold. 1975. *Energy and Structure: A Theory of Social Power*. Austin: University of Texas Press.
- \_\_\_\_\_. 1978. "Man, Energy, and Anthropology: I Can Feel the Heat, But Where's the Light?" *American Anthropologist* 80:297-309.
- Barker, Holly. 1997. "Fighting Back: Justice, the Marshall Islands and Neglected Radiation Communities." In Barbara Rose Johnston, ed. *Life and Death Matters: Human Rights and the Environment at the End of the Millennium*, 290-306. London: Alta Mira.
- Behrends, Andrea, Stephen Reyna, and Guenther Schlee, eds. 2011. *Crude Domination: The Anthropology of Oil*. New York: Berghahn.
- Bennett, Jane. 2010. *Vibrant Matter: A Political Ecology of Things*. Durham: Duke University Press.
- Bogost, Ian. 2012. *Alien Phenomenology, or What It's Like to Be a Thing*. Minneapolis: University of Minnesota Press.
- Boyer, Dominic. 2010. "On the Ethics and Practice of Contemporary Social Theory: From Crisis Talk to Multiattentive Method." *Dialectical Anthropology* 34(3):305-324.
- \_\_\_\_\_. 2011. "Energopolitics and the Anthropology of Energy." *Anthropology Newsletter* May:5, 7.
- Boykoff, Maxwell T. 2011. *Who Speaks for the Climate? Making Sense of Media Reporting on Climate Change*. Cambridge: Cambridge University Press.
- Briggs, Charles L. and Mark Nichter. 2009. "Biocommunicability and the Biopolitics of Pandemic Threats." *Medical Anthropology* 28(3):189-198.
- Callon, Michel. 1986. "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay." In John Law, ed. *Power, Action and Belief: A New Sociology of Knowledge*, 196-233. London: Routledge.
- Chakrabarty, Dipesh. 2009. "The Climate of History: Four Theses." *Critical Inquiry* 35(2):197-221.
- Clark, Pilita. 2013. "EU Emissions Trading Faces Crisis." *Financial Times*, January 21. Accessed from [http://www.ft.com/cms/s/0/42e719c0-63f0-11e2-84d8-00144feab49a.html?ftcamp=published\\_links%2Ffrs%2Fworld\\_europe%2Ffeed%2F%2Fproduct#axzz2uRWfZhw](http://www.ft.com/cms/s/0/42e719c0-63f0-11e2-84d8-00144feab49a.html?ftcamp=published_links%2Ffrs%2Fworld_europe%2Ffeed%2F%2Fproduct#axzz2uRWfZhw) on Feb 26, 2014.
- Coronil, Fernando. 1997. *The Magical State: Nature, Money, and Modernity in Venezuela*. Chicago: University of Chicago Press.
- Crate, Susan and Mark Nuttall, eds. 2009. *Anthropology and Climate Change*. Walnut Creek, CA: Left Coast Press.
- Davis, Mike. 2010. "Who Will Build the Ark?" *New Left Review* 61(Jan/Feb):29-46.
- Dawson, Susan E. 1992. "Navajo Uranium Mining Workers and the Effects of Occupational Illnesses: A Case Study." *Human Organization* 51(4):389-397.
- de Landa, Manuel. 2002. *Intensive Science and Virtual Philosophy*. New York: Continuum.
- Edwards, Paul N. 2010. *A Vast Machine: Computer Models, Climate Data and the Politics of Global Warming*. Cambridge: MIT Press.
- Fassin, Didier. 2001. "The Biopolitics of Otherness: Undocumented Immigrants and Racial Discrimination in the French Public Debate." *Anthropology Today* 17(1):3-7.
- Foucault, Michel. 1978. *The History of Sexuality, Vol. 1: The Will to Knowledge*. London: Penguin.
- \_\_\_\_\_. 1979. *Discipline and Punish*. New York: Pantheon.
- \_\_\_\_\_. 1993. "About the Beginnings of the Hermeneutics of the Self: Two Lectures at Dartmouth." *Political Theory* 21(2):198-227.
- \_\_\_\_\_. 2002. *Society Must be Defended: Lectures at the Collège de France, 1975-76*. New York: Picador.
- Greenhalgh, Susan and Edwin A. Winckler. 2005. *Governing China's Population: From Leninist to Neoliberal Biopolitics*. Stanford: Stanford University Press.
- Guggenheim, David, dir. *An Inconvenient Truth*. Film, 100 min. Lawrence Bender Productions.

- Gusterson, Hugh. 1998. *Nuclear Rites: A Weapons Laboratory at the End of the Cold War*. Berkeley: University of California Press.
- Haraway, Donna. 1991. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." In Donna Haraway, ed. *Simians, Cyborgs, and Women*, 149-181. London: Free Association Books.
- Harman, Graham. 2002. *Tool-Being: Heidegger and the Metaphysics of Objects*. Chicago: Open Court.
- Henning, Annette. 2005. "Climate Change and Energy Use." *Anthropology Today* 21(3):8-12.
- Ingold, Tim. 2011. *Being Alive: Essays on Movement, Knowledge and Description*. New York: Routledge.
- Jamieson, Dale. 2001. "Climate Change and Global Environmental Justice." In Clark Miller and Paul Edwards, eds. *Changing the Atmosphere: Expert Knowledge and Global Environmental Governance*, 287-307. Cambridge: MIT Press.
- \_\_\_\_\_. 2011. "Energy, Ethics and the Transformation of Nature." In Denis Arnold, ed. *The Ethics of Global Climate Change*, 16-37. London: Cambridge University Press.
- Jorgensen, Joseph G. 1990. *Oil Age Eskimos*. Berkeley: University of California Press.
- \_\_\_\_\_, ed. 1984. *Native Americans and Energy Development, II*. Cambridge: Anthropology Resource Center.
- Jorgensen, Joseph G., Richard O. Clemmer, Ronald L. Little, Nancy J. Owens, and Lynn A. Robbins, eds. 1978. *Native Americans and Energy Development*. Cambridge: Anthropology Resource Center.
- Kashi, Ed. 2008. *The Curse of the Black Gold*. Michael Watts, ed. New York: Powerhouse Press.
- Klieman, Kairn. 2008. "Oil, Politics, and Development in the Formation of a State: The Congolese Petroleum Wars, 1963-68." *International Journal of African Historical Studies* 41(2):169-202.
- Kruse, John, Judith Kleinfeld, and Robert Travis. 1982. "Energy Development on Alaska's North Slope: Effects on the Inupiat Population." *Human Organization* 41(2):95, 97-106.
- Latour, Bruno. 1988. *The Pasteurization of France*. Alan Sheridan and John Law, trans. Cambridge: Harvard University Press.
- \_\_\_\_\_. 1993. *We Have Never Been Modern*. Catherine Porter, trans. Cambridge: Harvard University Press.
- Love, Thomas. 2008. "Anthropology and the Fossil Fuel Era." *Anthropology Today* 24(2):3-4.
- Love, Thomas and Anna Garwood. 2011. "Wind, Sun and Water: Complexities of Alternative Energy Development in Rural Northern Peru." *Rural Society* 20:294-307.
- Masco, Joseph. 2006. *Nuclear Borderlands: The Manhattan Project in Post-Cold War New Mexico*. Princeton: Princeton University Press.
- Mason, Arthur. 2007. "The Rise of Consultant Forecasting in Liberalized Natural Gas Markets." *Public Culture* 19(2):367-379.
- Mason, Arthur and Maria Stoilkova. 2012. "Corporeality of Consultant Expertise in Arctic Natural Gas Development." *Journal of Northern Studies* 6(2):83-96.
- McKim, Joel. 2009. "Of Microperception and Micropolitics: An Interview with Brian Massumi, 15 August 2008." *Inflexions* 3:1-19. Accessed from [www.inflexions.org](http://www.inflexions.org) on Feb 11, 2014.
- McNeish, John-Andrew and Owen Logan, eds. 2012. *Flammable Societies: Studies on the Socio-economics of Oil and Gas*. London: Pluto.
- Meillasoux, Quentin. 2008. *After Finitude: An Essay On The Necessity Of Contingency*. Ray Brassier, trans. London: Continuum.
- Mitchell, Timothy. 2009. "Carbon Democracy." *Economy and Society* 38(3):399-432.
- \_\_\_\_\_. 2011. *Carbon Democracy: Political Power in the Age of Oil*. New York: Verso.
- Morton, Timothy. 2007. *Ecology without Nature: Rethinking Environmental Aesthetics*. Cambridge: Harvard University Press.
- \_\_\_\_\_. 2010. *The Ecological Thought*. Cambridge: Harvard University Press.

- Nader, Laura. 1980. *Energy Choices in a Democratic Society. A Resource Group Study for the Synthesis Panel of the Committee on Nuclear Alternative Energy Systems for the U.S. National Academy of Sciences*. Washington, DC: National Academy of Sciences.
- \_\_\_\_\_. 1981. "Barriers to Thinking New About Energy." *Physics Today* 34(9):99-104.
- \_\_\_\_\_. 2004. "The Harder Path—Shifting Gears." *Anthropological Quarterly* 77(4):771-791.
- \_\_\_\_\_, ed. 2010. *The Energy Reader*. Oxford: Wiley-Blackwell.
- Nader, Laura and Stephen Beckerman. 1978. "Energy as it Relates to the Quality and Style of Life." *Annual Review of Energy* 3:1-28.
- Negarestani, Reza. 2008. *Cyclonopedia: Complicity with Anonymous Materials*. Melbourne: Re.Press.
- Nordstrom, Jean Maxwell, James P. Boggs, Nancy J. Owens, and JoAnn Sootkis. 1977. *The Northern Cheyenne Tribe and Energy Developments in Southeastern Montana. Vol 1: Social and Cultural Investigations*. Lame Deer: Northern Cheyenne Research Project.
- O'Neill, John J. 1940. "Enter Atomic Power." *Harper's* 181(June):1-10.
- Oreskes, Naomi. 2004. "The Scientific Consensus on Climate Change." *Science* 306(5702):1686.
- Parker, Wendy S. 2010. "Predicting Weather and Climate: Uncertainty, Ensembles and Probability." *Studies in History and Philosophy of Modern Physics* 41:263-272.
- Peace, William J. 2004. *Leslie A. White: Evolution and Revolution in Anthropology*. Lincoln: University of Nebraska Press.
- Petryna, Adriana. 2002. *Life Exposed: Biological Citizens after Chernobyl*. Princeton: Princeton University Press.
- Pinkus, Karen. 2008. "On Climate, Cars, and Literary Theory." *Technology and Culture* 49(4):1002-1009.
- PMLA (*Publications of the Modern Language Association of America*). 2011. "Editor's Column: Literature in the Ages of Wood, Tallow, Coal, Whale Oil, Gasoline, Atomic Power, and Other Energy Sources." *PMLA* 126(2):305-326.
- Potter, Robert D. 1940. "Is Atomic Power at Hand?" *Scientific Monthly* 50(6):571-574.
- Powell, Dana E. and D. J. Long. 2010. "Landscapes of Power: Renewable Energy Activism in Diné Bikéyah." In Shery Smith and Brian Frehner, eds. *Indians & Energy: Exploitation and Opportunity in the American Southwest*, 231-262. Santa Fe: SAR Press.
- Rabinow, Paul and Nikolas Rose. 2006. "Biopower Today." *BioSocieties* 1(2):195-217.
- Rappaport, Roy. 1975. "The Flow of Energy in Agricultural Society." In Solomon Katz, ed. *Biological Anthropology: Readings from Scientific American*, 371-387. San Francisco: W. H. Freeman.
- Reyna, Stephen and Andrea Behrends. 2008. "The Crazy Curse and Crude Domination: Toward an Anthropology of Oil." *Focaal* 52(1):3-17.
- Robbins, Lynn. 1980. *The Socioeconomic Impacts of the Proposed Skagit Nuclear Power Plant on the Skagit System Cooperative Tribes*. Bellingham: Lord and Associates.
- \_\_\_\_\_. 1984. "Energy Developments and the Navajo Nation: An Update." In Joseph Jorgensen, ed. *Native Americans and Energy Development*, 35-48. Cambridge: Anthropology Resource Center.
- Sawyer, Suzana. 2004. *Crude Chronicles: Indigenous Politics, Multinational Oil, and Neoliberalism in Ecuador*. Durham: Duke University Press.
- \_\_\_\_\_. 2007. "Empire/Multitude—State/Civil Society: Rethinking Topographies of Power through Transnational Connectivity in Ecuador and Beyond." *Social Analysis* 51(2):64-85.
- Sawyer, Suzana and Terence Gomez, eds. 2012. *The Politics of Resource Extraction: Indigenous Peoples, Corporations and the State*. London: Palgrave Macmillan.
- Scheer, Hermann. 2004. *The Solar Economy: Renewable Energy for a Sustainable Global Future*. London: Earthscan.
- \_\_\_\_\_. 2005. *A Solar Manifesto*. London: Earthscan.
- Stewart, Kathleen. 2008. *Ordinary Affects*. Durham: Duke University Press.
- Strauss, Sarah and Ben Orlove, eds. 2003 *Weather, Climate, Culture*. Oxford: Berg.

- Strauss, Sarah, Thomas Love, and Stephanie Rupp, eds. 2013. *Cultures of Energy*. Walnut Creek, CA: Left Coast Press.
- Szeman, Imre. 2007. "System Failure: Oil, Futurity and the Anticipation of Disaster." *South Atlantic Quarterly* 106(4):805-823.
- \_\_\_\_\_. 2013. "What the Frack? Combustible Water and Other Late Capitalist Novelties." *Radical Philosophy* 177(Jan/Feb). Accessed from <http://www.radicalphilosophy.com/commentary/what-the-frack> on Feb 11, 2014.
- Taylor, Bron. 2009. *Dark Green Religion: Nature Spirituality and the Planetary Future*. Berkeley: University of California Press.
- Traweek, Sharon. 1988. *Beamtimes and Lifetimes: The World of High Energy Physicists*. Cambridge: Harvard University Press.
- United Nations. 1992. *United Nations Framework Convention on Climate Change*. Accessed from <http://unfccc.int/resource/docs/convkp/conveng.pdf> on Feb 11, 2014.
- Wenzel, Jennifer. 2006. "Petro-Magic-Realism: Toward a Political Ecology of Nigerian Literature." *Postcolonial Studies* 9(4):449-464.
- Wheeler, Stephen M. and Timothy Beatley, eds. 2004. *The Sustainable Urban Development Reader*. New York: Routledge.
- White, Leslie. 1943. "Energy and the Evolution of Culture." *American Anthropologist* 45(3):335-356.
- \_\_\_\_\_. 1949. *The Science of Culture: A Study of Man and Civilization*. New York: Farrar, Straus and Giroux.
- \_\_\_\_\_. 1959. *The Evolution of Culture: The Development of Civilization to the Fall of Rome*. New York: McGraw-Hill.
- \_\_\_\_\_. 1987. *Ethnological Essays*. Beth Dillingham and Robert L. Carniero, eds. Albuquerque: University of New Mexico Press.
- Whitehead, John A. 1987. "The Partition of Energy by Social Systems: A Possible Anthropological Tool." *American Anthropologist* 89:686-700.
- Wilhite, Harold. 2005. "Why Energy Needs Anthropology." *Anthropology Today* 21(3):1-3.
- Winther, Tanja. 2008. *The Impact of Electricity: Development, Desires and Dilemmas*. Oxford: Berg.
- Wolfe, Cary. 2010. *What is Posthumanism?* Minneapolis: University of Minnesota Press.

#### Foreign Language Translations:

Special Collection — Energopower and Biopower in Transition  
Energopower: An Introduction

Coleção Especial - Energopoder e Biopoder em Transição  
Energopoder: Uma Introdução

特辑：转型中的能源权力与生物权力  
前言：何谓“能源权力”

Специальный выпуск — Энергетика и биоэнергетика: переходный этап

مجموعة خاصة - شركات الطاقة والطاقة الحيوية في مرحلة إنتقالية  
شركات الطاقة: مقدمة

