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To Transact and Shimmer: Energy in the Expanded Field

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Abstract

Few concerns are as important in contemporary politics as energy, that vital force. Janus-faced, energy animates modern life while seeming simultaneously to ensure its undoing. It is a notion haunted in equal measure by promise and doom. In anthropology, the potential for energetic relations to alter worlds was of intense disciplinary importance well before the current interest in energy production as technoscientific endeavor. More specifically, an expanded history of the subdiscipline shows how contemporary understandings of energy as an extractable and (unevenly) deployed resource link to a more immaterial, indeed magical, theorizing of influence and power. Energy thus conceptualized stands in excess of thermodynamics, and it continues to provide anthropologists with a fruitful means of moving between things, scales, materials, communities, ideas, and even disciplines. As such, anthropologists rarely, if ever, study energy itself; instead, they use it to provide a new angle into classic concerns and, equally, as a sharp-toothed vehicle for the analysis of contemporary political and economic systems as much as energetic ones.

1. INTRODUCTION

> Cascading scenes of devastation touched the question of life, giving it an energy, a rhythm, a palpable excess.
>
> —Stewart (2018, p. 22)

The anthropology of energy does not begin with the burning of carboniferous fuels; wood fires form no precursor to close studies of lives with coal, oil, gas, or the radioactive stones that feed nuclear power. It predates these fuel-based concerns by a century, and it was from the start (and largely remains) what Stewart (2018) names "a palpable excess." Energy for anthropologists is what travels with materials but is not material. Rather, one might say it is the spirit of the thing. But not any sort of spirit, energy is a spirit that accumulates unevenly—which can, in fact, be manipulated to accumulate unevenly—to become what we call power, in all senses of the word.

One mystery of energy as it has moved through the discipline over the decades is the question of how this unevenness happens. How is it that some people, some social formations, have more power than others? What fuels this inequality? How might it be tempered? And what follows from it? Thus, though the past decade has been characterized by a veritable explosion of anthropological research into fuels and their effects, these works also find themselves caught up in questions of ineffable transfers of power and oft-brutish and yet also magical attempts to control these. This article is, then, an overview of a field in full bloom. Starting early in the history of anthropology, with gardens full of yams, its aim is to fit the contemporary moment of fossil fuel–driven climate change and the multiple crises of capitalism and Anthropocene into a longer story of an abiding disciplinary concern.

Rather than following a standard genealogy of energy as at once muscular (horsepower) and thermodynamic (work), this review charts a parallel if less worn path best articulated by Visvanathan (2007). Here, narratives of energy grounded in an acceptance of thermodynamics reduce energy's variegated dispositions into little more than a grab bag of capturable resources, which modern state power uses to substantiate itself (see also Degani et al. 2020). For Visvanathan (2007), thermodynamics are less a fundamental physics and more a "theology" of modernism, "a collection of virtues. . .a domestic civic, a grammar, a hygiene, a ritual for living" (p. 189). He writes, of modern India, that

> energy became transformed into what the state and the plan considered it to be, and petroleum, nuclear, hydro and electric now constituted the alphabet of the new state. Expert energy was official energy. Energy generated by the people, the traditional world of dung and fuelwood was not considered immaculate and scientific. Within this world all forms of energy were seen as standardized and convertible, disassembled from the knowledge system they were implicated in. (p. 193)

This then is my task here: to show how anthropologists' struggles to make sense of processes of power and its transfer beyond a physics of thermodynamics help to situate these dynamics—as a theology of work and waste—as a culturally specific formation. In this light, together with Visvanathan, we might come to understand how "[t]he physics of the steam engine carries along with it its anthropology of modernity" (Visvanathan 2007, p. 194) and, via this shift of orientation, to refigure disciplinary approaches to contemporary geopolitics within a broader conceptualization of energetics, dynamics, and powers (see Jobson 2021).

Because my driving curiosity is with what has characterized anthropological engagements with energy, many fundamental works in the energy humanities—in which energy is almost always intertwined with climate change—have been omitted or minimized, though it would behoove any student of the field to engage with them all, as most contemporary anthropologists of energy

do (see especially Chakrabarty 2009, 2021; Huber 2013; Mitchell 2013; Ghosh 2016; Malm 2016; Pinkus 2016; Szeman & Boyer 2017; Daggett 2018, 2019; Timofeeva 2022).

There was, however, an anthropology of energy before climate change (Howe 2015, Knox 2020, O'Reilly et al. 2020) and thermodynamically inflected definitions [e.g., energy as "the fundamental ability to do work" (Smith & High 2017)] came to distinguish the field. It is to this longer-standing concern for the relationship of efficacies to materials that I devote this review, resituating energy as a core concern of the discipline well before this word "energy" came to be so narrowly deployed. For this reason, I begin in Section 2 in the Pacific, as is so often the case with anthropological concepts, as a means of providing an immediate sense of that to which the expanded field pertains. Section 3 moves back in time to the discipline's mana moment (1870–1920) to frame a discussion of electricity as a mechanically produced magical effect. Section 4 introduces the big wave of ethnographies since roughly 2010 that focus on fuels, their technologies, and attendant ruination. Rather than creating an absolute hierarchy of influence, in this section I put forth a more pointillistic and personal account to demonstrate (rather than just narrate) how a move away from the genealogical method might capture the remarkable breadth of subdisciplinary efflorescence. Section 5 focuses on the one notable feature of many contemporary works: the close study of capitalist energy projects that were never built. Section 6 then returns to the broad edges of energy thermodynamically conceived. I end, in Section 7, with flights of fancy. Since 2020, anthropologists of energy have become increasingly collaborative and surprisingly playful. This shift is also a sort of energy transition, from the thick rationality of the scholarly endeavor to a more gorgeous combination of words, ideas, and persons, as if thermodynamics as theology were riven and cracked, even if this rending is evidenced mostly in play with genre, stricture, and structure.

As such, there is a well-worn history of the anthropology of energy that is *not* presented here. That story begins with fossil fuels and the habit structures they engender and then traces these habitudes backward genealogically to colonial relations to earth and embodied energy—including not just coal, but slavery, and sugar—and their early capitalist exploitation (White 1943, 1950; Boyer 2014, 2023a; Hughes 2017; see also Nikiforuk 2014, Smil 2017). This genealogy is not wrong; indeed, in the main it is right, but I hold that part of moving beyond fossil fuels is understanding that they are not necessarily a guiding logic for something like "energy" writ large, but rather a subcategory of a more general phenomenon in which powers move and are moved, clump, and can be wielded (Kasmir & Gill 2018). A token of a type, the story of fossil fuels need not be the only one we tell (and we do tell it obsessively), nor do their logics need be the only histories we know. I situate the density and intensity of these fuels, a palpable excess if ever there was one, within a far broader understanding of energy as a means of expanding understandings not only of the field but of a world where these logics no longer hold (Lepselter 2016), not entirely anyway.

2. RELATIONALITY: DETAILS OF AN UNLIKELY MARRIAGE

Given that energy for anthropologists is a never-ending story of circulation and transaction, of vibrancy being made via activities bound up in objects that shimmer with the symbolic qualities of privilege, it should perhaps not come as a surprise that there is something of the Kula in it and something of Marx. Each of these resemblances has a theorist, though neither quite centers energy in the contemporary resource economics sense of the word. In *The Fame of Gawa*, Munn (1992) focuses on how, on the Melanesian island of Gawa, the energy in food is transformed—by gifting rather than eating—to make social relations across archipelagic space and time and also spacetime itself. Separately, Hornborg has over decades honed a fierce argument against the misattribution

of prestige to those who congeal appropriated land and labor into apparently neutral technologies. I place Munn and Hornborg side by side because they provide complementary, though opposite, analyses of the unequal transaction of energy across a broad geography; they help us see power gifted (in the first case) and stolen (in the second) as it is made transactionally, socially, through the manipulation of materials and their attendant spirits.

Hornborg's argument is that the industrial revolution and its endlessly referenced steam engine were pointedly *not* products of British ingenuity. Industrialization and its machines were made of Swedish forests, American plantation land, African enslaved bodies, and cotton expropriated from everywhere but Britain (Hornborg 2024, p. 37). The coal may have come from their own holes, but their glory, their fame, was stolen—a theft hidden in the material bodies of machines. This act of hiding appropriated energies—not just labor, but slavery as an industry, and not just raw materials, but the ravaging of entire biota—in mechanical forms is so prevalent that scholars approaching industrialization, in their tendency to focus on fuels (e.g., coal), fail to recognize machines for what they are: the embodied "agonies of people and ecosystems beyond our field of vision" (Hornborg 2023, p. 80; see also Goodman 1969). In other words, energy is not so much what makes a machine run; energy is the organization of inequalities that makes it exist. For Hornborg (2020), "the human reorganization of nature" is both "a way of physically establishing social inequalities" (p. 211) and of misattributing the glory of this endeavor to the products of plunder.

In contrast, for Munn (1992), glory, or in her terminology, fame, is also entirely relational. What it is not is expropriative. Fame, rather, is the sought after result of an ethically exemplary practice of giving away—rather than eating—food (yams, in the main). Munn writes,

> [G]iving food away to overseas visitors for their own consumption is perceived as initiating a spaciotemporal extending process—an expansion beyond the donors' persons and the immediate moment, and [also] beyond Gawa island—as visitors take away favorable news of Gawan hospitality. In this way food. . .is converted into fame. . .an extrabodily component of the self. (p. 50)

When eaten, the yam is the cordoning of energies, the potential for fame wasted; it is rubbish. Indeed, in Gawa, the term for a selfish person is "one who eats" (Munn 1992, p. 49). Influence, by contrast, comes from being known as the one who gifted a first-rate yam, who threw a fine feast, who is consistently generous with exceptional comestibles. In gifting food, Munn writes, "[t]he donor reconstitutes himself in the mind of the other, thus transforming his own level of control beyond himself" (p. 51). For Munn, then, examining the uneven distribution of power is mainly a step toward a larger project of understanding how time and space are actually created via the exchange of something—a yam—that, in our world, we would render in terms of calories, that is to say a qualia of energy that counts only *if* you eat it. In Gawa, the energy of the yam counts only if you do not eat it; instead, it must be given away (Mauss 1970).

We can see, then, energy in two registers. For Gawans, it accrues via overseas commerce to he who gifts the materials that nourish both bodies and reputations. For empires, it adheres via overseas commerce to he who appropriates these materials and uses them to increase his own glory (Hornborg 2021). Read side by side, Munn and Hornborg show us that it is not trade, commerce, or even globalization that causes agony to ecosystems; rather, it is a misplaced understanding of to whom fame properly belongs. Hornborg sees these relations, within materials but also produced via their transactions, as both exploitative and forgotten; Munn sees them as artful and remembered. Fame adheres to both. It is all in the approach. Both, however, understand energy as fundamentally relational and as something that can be manipulated (via gift, theft, or capture) and which can be made to adhere unequally to certain persons and other entities (like steam engines) in the form of power, influence, prestige, fame, glory, wealth, and, most fundamentally,

the ability to control the fortunes of others in subtle and nonsubtle ways. Hornborg (2020) writes,

> 'Energy' is ultimately a *relational* concept denoting natural forces that are available for human harnessing by means of a 'technology' that is itself relational in that it is contingent on capital accumulation representing asymmetric social transfers of resources. (p. 208)

Munn (1992) notes, however, that "asymmetric social transfers of resources" are not only remembered or echoed in the fates of persons; they can be transferred qualitatively to the wants of worlds. "If people are hungry all the time and so want to eat a great deal, they will eat too much and deplete the gardens quickly. The garden becomes 'hungry' as it were, when people hungrily eat too much" (p. 85).

Perhaps the principal difference is in what happens when fame is apportioned to a thing rather than a being. Were the fruits of one's garden given willingly to the smelting of steel, the printing of cogs, the making of the mettle and industry of the steam engine, could glory be passed in this way? Or is the slippage from gift to resource most consummately accomplished in the forge? The power of the mechanical exists in part in its capacity to slip between registers; a steam engine may eat (coal), it may excrete (exhaust), and it may move seemingly of its own volition, and yet it remains an entity that cannot remember and cannot recount the many gifts and many thefts that brought it into being. All of this, with electricity, intensifies.

3. ANIMATION: BRAZENING AN IMPLAUSIBLE DEVELOPMENT

> Mana moves through the social field, he said, much like electricity.
>
> —Styers (2017, p. 321)

Long before anthropologists were studying energy in the contemporary mode of resource extraction and combustion (and the wonderous and deleterious effects of both), they were troubled by the animacy of objects. Mazzarella (2017) has coined this formative obsession as anthropology's "mana moment" (1870–1920) during which Europe and North America (where anthropologists were from, but not where they conducted research) were slowly but steadily moving toward electrification.

> At the most general level, mana was "the ever present actuating force in things," a physical as well as a moral force, a "divine psychic potency," "a state of efficacy, success, truth, potency, blessing, luck, realization"—or maybe just the difference between the gardener who gets the bumper crop after using the exact same inputs and techniques as his neighbor who does not. (Mazzarella 2017, p. 39)

Anthropologists' work during this period was motivated not so much by the literal presence of electricity, but by the problem of it.[1] "If mana appears as a kind of mystical substance," Mazzarella (2017) writes, "then it is because electricity and what it enabled at home was already magical" (p. 54). In other words, mana as an "omnipresent, supernatural efficacy" (p. 39) presented the same confusing set of effects and wonders as did electricity; both somehow involved garnering and controlling immaterial forces or potencies not directly present in the materials at hand. These similarities were not lost on anthropologists puzzling through the vitality of things. R.R. Marett wrote, in 1908, that "*Mana* is always *mana*, supernatural power, differing in intensity—in voltage so to speak—but never in essence" (quoted in Mazzarella 2017, p. 51). Or Emile Durkheim who, in finding a corollary for collective efference in electricity, wrote in 1912,

[1]For an accounting of the startling breadth of changes attendant to the arrival of electrification, see especially Winther (2008, 2013) and, similarly, for oil, Limbert (2010).

> When I speak of principles [such as mana] as forces I do not use the word in a metaphorical sense; they behave like real forces. In a sense, they are even physical forces that bring about physical effects mechanically. . . . [Once] individuals are gathered together, a sort of electricity is generated from their closeness and quickly launches them to an extraordinary height of exaltation. (quoted in Mazzarella 2017, pp. 51–52)

Although Mazzarella describes various ways that early anthropologists wove their own rudimentary understandings of electricity through mana (somewhat obsessively, he adds), between the lines they also did the obverse: They used mana to help make sense of the mystery of electricity—an equally magical force of animation. In their befuddlement, these early anthropologists were not unlike people living under advanced capitalism today, who, when asked, "What is energy?" attribute half to science, half to God, and what remains to magic, willy-nilly, and as suits the circumstance. "A force ubiquitous yet invisible, uncontrollable, yet indispensable," writes Rupp (2016, p. 80), quoting a 21-year-old New Yorker a century after the mana moment was well and truly ended: "Energy. . .is whatever powers what we do. Energy is. . . . so so *much*. Energy is. . .that is a good question. Energy is. . .is. . .everything" (p. 80, ellipses in original). It is "[a]n appalling fog of confusion," as E.E. Evans Prichard said of mana (Mazzarella 2017, p. 48). Or as anthropologist Nandita Badami once said off the cuff of the subfield, "The anthropology of energy is never about energy."

I would agree. Despite a somewhat obsessive return to materials, anthropologists in the present moment remain concerned with energy's invisible, yet sensible, abstractions—or, more accurately, relations. Energy becomes both a mode of and a foil for analyses of a broad swath of immaterial yet force-filled concepts such as time (Ahmann 2019, Shin & Trentmann 2019) and future (Lennon 2020, Abram et al. 2023, Waltorp et al. 2023), value (Hornborg 1992, Phillips 2022) and magic (Coronil 1997, Weszkalnys 2013, Trovalla & Trovalla 2015), power (Love & Garwood 2013, Boyer 2014) and vitality (Gudeman 2012, Povinelli 2016), hope (Slayton 2013, Enslev et al. 2018) and optimism (High 2022). Indeed, it is through worrying these concepts that contemporary studies of energy are bound to deeper though rarely excavated older notions of energy critical to the field (save Coleman 2019). One might say of energy, then, as Mazzarella (2017) does of mana that "[p]erhaps [it] is where anthropologists place a shape-shifting signifier because they simply don't know what is going on" (p. 51). This perplexity arises from energy, which like mana has no materiality. Energy is not a thing and is not thus an object of study like any other. Palpable and efficacious, energy is real, but in a special way: It can be felt and manipulated, deployed even, but this deployment is always imperfect. Energy is forever exceeding dreams of flawless control, management, systemization, predictability, and efficiency. Energy is not the box. It is not in the box; rather, it is always on its way out of the box, often because the box itself is on fire. As such, energy is both temptation and transformation. It is as much an instigator of dreams as an animator of activities and materials.

The closest we get to acknowledging the confusion of the ineffable, yet deployable mystery of energy remains electricity. Indeed, in writing about electricity, Gupta (2015) captures these quasi-magical, mana-ish qualities and brings us one step beyond, bringing them to thermodynamic processes of value creation, for electricity offers anthropologists something that mana did not. A magical force of animation, it is also an industrial product.

> Of all the forms of energy that fuel our modern world and its lifeways, electricity is perhaps the most pervasive and also the most interesting. . . . [E]lectricity is an immaterial object. It cannot be seen, smelled, or heard, and for all practical purposes, it cannot be tasted or touched without lethal consequences. There is thus no sensual way to experience electricity. Of course, we can see the plants where it is generated, the wires through which it is carried, the appliances or machines that make use of it, and the effects it has on the body. Electricity is always mediated, and thus is from the very

beginning a social and cultural thing, not something that belongs to the natural world, however that might be construed. (Gupta 2015, p. 556)

In its domesticated, practical form, electricity always comes from somewhere: a river flowing or dammed, a factory flash-combusting coal, the industrial stalks of wind turbines, a nuclear reactor, a gas station (Bakke 2023a). Machines are involved, including the steel of generators as much as the diesel they run on; the copper of wires as much as the current they transmit; the vacuum in the bulb as much as the electrons that pass through it. Machines wrap our grid, on both ends and well enough in between; they make electricity, and they are the ones who use it.

Yet, because it is lethal (or, at the very least, shocking) and because it is a force and not a thing and so resembles nothing else in the known world, electricity remains beyond everyday comprehension. It is a form of energy that, despite being totally industrialized, is swathed in misunderstandings (some of which are given form in infrastructural designs, policies, and tariffs) (Bakke 2019b). Contemporary anthropologists of energy must thus deal with the complexity of electricity—and the ignorance of it—which is, in part but only in part, infrastructural.

Electricity's story is also that of development as a colonial and neocolonial project. It is the story of protest against what infrastructure erases and, equally, against what the absence of reliable electricity forecloses. Electricity is the story of money and the power that entity begets and of ethics, of values, and again of promise. It infects communities as they tinker and exchange as much as build and roar against building (Binder 1999, Anusas & Ingold 2015, Winther & Wilhite 2015, Abram et al. 2019, Phillips & Petrova 2021; see also Günel 2018). In other words, with electricity, mana comes to ground, and with it—and beyond it—the ground comes to energy. Suddenly, we are digging up the earth; suddenly, it seems to anthropologists of energy that we are doing little else.

4. MATERIALIZATION: A PURPOSEFULLY POINTILLISTIC PORTRAIT OF THE EXPANDED FIELD

Energy is expressed only in terms of other abstractions, and yet we know it exists, that energy the magically convertible phenomenon behind all phenomena is REAL.

—Dethlefson (1978, quoted in Rupp 2016, p. 79)

There are small shiny moments in the vast and storied history of the anthropology of energy that have proved indelible.[2] There was that time that Cepek gave a paper about oil extraction in Ecuador in the early 1990s, in which solar panels were provided to the Cofán by Petroecuador in hard-won compensation for damages caused by drilling their long-inhabited jungle. I remember thinking it was an iconic (and ironic) case until Cepek rounded the story by describing the panels in ruins, covered in vines and earth, unconnected, unused. Materials molder into the jungle floor because they need maintenance, care, and know-how; they need an industrial ecosystem of their own, and this was not gifted. Without that ecosystem, the panels were junk—the detritus of a modernism that arrived piecemeal (Cepek 2018) or what scholars of infrastructure call "promise" (Breglia 2013, Anand et al. 2018). In a similar vein, I remember Jamie Cross describing solar lamps in the trash heaps of communities around the Indian Ocean, an award-winning product in the

[2]Pointillism is a painterly technique that relies on the ability of the eye and mind of the viewer (here, the reader) to blend small dots of color into a fuller image; it eschews realism as the transmission of accurate rendition in favor of enlisting the viewer's own capacities to arrange what they see into legibility. As such, it is a strong method for rendering detail and complexity in a flattened field. In pointed contrast to the genealogical method, pointillism eschews entirely the seduction of seemingly inevitable relations through time (Boas 1908, see also Günel & Watanabe 2023). It is the method I use here.

service of "development" having become indelible as garbage (Cross 2013, 2016); a commodity given in the shape of hope—they worked for a while (Cross 2019). I remember reading Appel writing about the gross domestic product as a perverse metric, one that makes oil valuable while maintaining poverty unmeasured, the human population reduced to a number by means of which to divide another number, to produce a lie about wealth (Appel 2012, 2017, 2019). And when Shin described how women in Japan were the ones who knew how to tinker new electricity systems into functionality because they were housewives at home when electricity arrived to punctuate their walls and lives—the grid's final tendrils imperfectly infrastructured into domestic space (Shin 2020). I remember thinking, "It's amazing how every story of the same thing is different." And take Cameron Hu's decision to teach Pine's (2019) *The Alchemy of Meth* in my Anthropology of Energy class. Hu explained that it was the story of how meth allows people to move for a moment at the speed of modern life. To people in places without the snap-snap of contemporary commodity capitalism time itself is gone awry, and meth helps; it offers if not the promise of modernity—fossil-fueled, electrified, so fast—then at least a momentary sense of being in sync, of moving that fast too. Cooking speed, taking speed, speeding [see also Ringel (2018)]. I remember Petryna (2013) on Chernobyl, Morimoto (2023) on Fukushima, Ferguson (2005) on the archipelagic shape of an oil company, Özden-Schilling (2021) on the shaking of fists at overhead transmission lines built without care for those who lived beneath them. Resistance makes things hot by slowing them down. Activists use it to protest the bulldozing of rights and land (Dhillon & Estes 2016); electricity systems use it to make toast (Bakke 2016b). I remember, at every turn, money (Field 2022a,b), money (Özden-Schilling 2015, 2024), money (High 2019) and that somehow as a student I lost the department's physical copy of Joe Masco's (1999) dissertation. I remember how it had grown ragged, dogeared, before it disappeared.

Some works are more important to the emergence of a field (Coronil 1997, Apter 2005, Love 2008, Nader 2010, Strauss et al. 2013, Boyer 2014, Rogers 2015a, Hughes 2017), and other works are more important to the creation of this thinker (including Appel et al. 2015, High & Smith 2018, Couling & Hein 2020, Polack & Farquharson 2022, Howe et al. 2023). Yet almost everything that matters to the anthropology of energy in its current instantiation—a superbloom of ethnographies roughly a decade in the making—figures here in this pointillistic and purposefully nongenealogical way of rendering the field. Here, we have time, value, hope, the commodity form (and its relationship to waste), political power, corporate power, industrial disaster, racial capitalism, toxicity, gender, protest, ethics, and the (dubious) promise of technoscientific solutions—and something more.

Across these contemporary works, a very solid relationship to the materiality of energy predominates, centered on fuels such as oil (Sawyer 2004; Weszkalnys 2013, 2015; Rogers 2015a,b; Jobson 2024), natural gas (Hudgins 2013, Hu 2025; and delightfully Govindrajan 2016), uranium (Masco 2006, Brooks 2012), or coal (Stewart 1996, Rolston 2010, Powell 2018, Goodman et al. 2020); electrical infrastructures such as power lines (Coleman 2017, Degani 2022), diesel generators small (Larkin 2016) and large (Günel 2020), wind turbines (Kim et al. 2018, Boyer 2019, Hughes 2021), district heating (Müller 2021), and hydroelectric dams (Folch 2015, Bakke 2016a, Whitington 2018, Jensen 2019a); or the industrially built means of harvesting earthly phenomena such as wind (Howe 2019), geothermal (Maguire 2021, Fonck 2024), or waves (Helmreich 2013, 2023; Watts 2018). I come to the sun in a few pages, as it provides a counterpoint to this lavish commitment to materialism.

Thus, although for anthropologists, energy remains the constitutional mystery it has always been, in startling contrast to the mana moment, research in the present starts somewhat obsessively with stuff, things, ores, materials, and infrastructures, as if energy must be industrially extracted or industrially produced in order to exist. This physicalism is a long way from collective

effervescence, the Kula, or even debt (Graeber 2011), all of which are energetic processes produced by and productive of relationality through time—a constitutional betweenness—that, though it can be violent, is also more like a dance than a smelter, more a sort of motion than a kind of object. If energy is only and always conceptualized as stored within a physical form and accessible principally via the exploitation of that being, by breaking or burning it—by ruining it—rather than as a sort of potent accompaniment to that form, then injustice, cruelty, destruction, and linear modes of economy come to feel inevitable. Under capitalism, even desire burns (Tsing 2000).

I do not begrudge this material grounding, however. I suspect it comes from two directions at once: first, the proliferation of new materials for making energy without abandoning either the commodity form or extractive capitalism as vehicles for economy (e.g., solar panels, batteries, electric vehicles); second, from the despoiling of the earth begotten by the ravages of unchecked capitalism that extends energy into atmospherics—that is, the Anthropocene plus climate change. In the first case, solutions are built in small forms and large; and in the second, the earth is disinterred and molecularized, principally through burning, and rendered thusly unto air in a process called wealth creation, until it feels like nothing is changing except the form of things, and that something more essential has got to give.

The rise of terms like "polycrisis" together with the detailed work of ethnographers bringing this abstraction to the everyday lives of land, plants, and animals (among whom are people and their gods) in particular places has helped to create a thoroughgoing analysis of the contemporary moment, a time after the end of history (Fukuyama 1992), when what matters most is energy but also when we do not know to what energy precisely adheres nor how to make it, and everything else, differently.

5. ENCHANTMENT: THE UNBUILT FUTURE

Yet there is a curious trend. A startling number of recent ethnographies that start with a very material element of a future energy system turn out to be the story of how this thing was not built (Rest 2012, Pederson 2017, Powell 2018, Boyer 2019, Dale & Karlsson 2019, Günel 2019, Howe 2019, Alexander 2023, Rogers 2023). Though each case toggles differently through judgments of success and failure, what makes them interesting to anthropologists of energy is the way they create an absence or a hole in the future. Scaled energy projects, when successful, are, to return to Munn, not unlike the yams set into social motion by Gawans as a means of organizing spacetime, when gifted yams draw faraway islands and faraway times nearer. They tighten a web of relationality between desired interactions and material relations (Larkin 2013). Energy projects, when *not* built, do the opposite. Like yams eaten, they condense place into locality—allowing distance to remain remote—even as they reject a future that foregrounds contemporary logics of power and influence. Unbuilt, these projects are a gift from capital rebuffed, an extended tenure of very specific relations cut and a future of unbuilding avoided. We will never have to take them down. What matters about them, then, is precisely their immateriality, their nonbeing, and how much work it takes to make them not so.

In my research with communities in rural Oregon who have been remarkably successful in stopping new petrochemical infrastructures—including, since 2010, five attempted liquified natural gas terminals and three gas-to-methane plants and several each of coal, propane, and oil-by-rail terminals (see Holmes 2024)—each success has furthered the development of a strange and powerful new entity, called The Estuary. Historically a vast swampy area useless for keeping cows and thus understood to be useless overall, the estuary has been newly promoted to the rank of beloved ecosystem. This area is not so much where the various export terminals were to have been built, but the land that would have been ruined by the dint of their existence. Dale & Karlsson

(2019) detail a similar process in a northern Norwegian community where existing legal frameworks were used to create "The Green Islands" as a newly prized ecosystem, by means of which they might preserve their offshore from oil and gas extraction; to date, it remains the only area in the Norwegian North Sea absent these industrial endeavors. To a certain degree, Boyer (2019) and Howe's (2019) "Isthmus of Tehuantepec" is also such an entity; no longer just a geological or geographic determination, it is made over into a place worthy of energetic protection.

Note, in these cases, the newly precious entity might appear to be a natural feature, but it does not exist prior to the protests; it is, rather, congealed and weaponized through them. Not an infrastructure, this made "natural" entity has both scale and clout sufficient to engage in an earnest battle with a creature as large and powerful as an energy corporation. It is, in this way, an energy technology that neither makes nor distributes energy in the modern sense of the term, nor even an earlier Durkheimian jittery "collective effervesce" notion of humans in proximity activating themselves via common activity (Durkheim 1964). Rather, it is a coalition among people, plants, animals, media forms, and the law intertwined in the making of a new form of life, worthy of alliance and protection. These golems of local resistance give form to community values held in opposition to the will of strong actors (states, corporations, or both aligned), but they also make legible, in a way make real, a mode of animating energetics that cannot be seen with eyes calibrated to the tune of fossil fuels. The tune is what matters here; these forms of energy do not hum in the key of oil (Bakke 2019a). New wind power infrastructures, new electricity-carrying power lines, and new green urban developments are stopped or simply fail to come into being as often as do new fossil-fueled infrastructures (see especially Günel 2019). These unbuilt energy futures are not, thus, about a particular mode of power generation but about stopping the materialization of power characterized by extractivism and the unabated geopolitical love affair with technoscientific solutions (Lennon 2024).

6. REFIGURATION: IN CONSIDERATION OF VARIOUS ROUND THINGS

Ingold (2023) offers us a picture of the sun, its body swollen and golden surrounded by rays of two different sorts extending outward into its heavenly environs. Some rays glint, stiff and pointy, and others are scintillating undulous waves. The two forms alternate. This picture of the sun appears across time, across oceans: in medieval Europe, in the Incan Empire, on the Argentinian flag. "As we go around the sun's disc," Ingold writes, we move between "geometry and fire. . .light as a ray and light as a flame. The straight lines order the universe, but it takes the wavy lines for the sun itself to shine" (pp. 209, 211).

Ingold has thought about this sun for us and made it over into a figure. With this sun, he offers a way for anthropologists interested, perhaps not in energy per se, but in the mysteries of a doubled world of materials and immaterials, to consider these in a relationship in which neither obscures the other, in which one is not burned to produce the other, and in which an equitable arrangement between orderliness and inspiration is both substantive and definitional.

If this sun is one conceptualization of energy in which a theology of thermodynamics (the pointy bits) is but half of what the sun is about, and if the future unbuilt offers an alternative creation myth from which modernist thermodynamic relations of production and waste are absented, then Visvanathan (2007) gives us yet another vision for a social order that sidelines thermodynamic efficacies which "increase disparities and warp priorities" (p. 197). "Consider a forest," he writes:

> A forest has a multiplicity of uses. . .but when we apply the modern criteria of efficiency embodied in the Second Law [of thermodynamics] tribal people lose access to the forest that provides food, fuel, fodder and medicine, this diversity of uses losing out to the paper industry, which soon converts the

> forest into a monocultural plantation of fast growing eucalyptuses. . .the logic of thermodynamics sets loose a chain reaction. . .[s]o the tribes and peasants are confronted not just with nation-states and multinationals, but also with the logic of modern science, which works against them. (p. 197)

In principle, Visvanathan (a bit like Hornborg above) would like us to notice a very particular alliance that is easily glossed over, namely that a science based on high-energy physics is best neither for forests nor for people. Anthropologists know this, I think, but Visvanathan's call is more radical than knowledge; it is for an unbundling of governance, economy, and science in their current modes to consider low-energy physics as a political-economic goal and, with it, to prioritize solutions at ambient rather than high temperatures. His call is to consider the poor instead of poverty, nutrition rather than calories, and the transformation of ideas rather than materials. Visvanathan, following C.V. Seshardi, calls the epistemology of low-energy physics a biomass society or *shahtki*, which is likable precisely because it makes it impossible to separate out a physics of energy from a theology of it (see also Chatti et al. 2017). "Biomass," he writes,

> is a word for people. . . . It smacks "of the ordinary and the nonmechanical. Compare the tree to a factory, or a cow to a reactor. Like the people it is not amenable to efficiency and control in a factory sense. You can't boss over the science of photosynthesis." The state thus has a problem with biomass that it does not have with electricity. . . . It is around biomass that the resistance to the state can come into being. . . . First, energy forms such as oil, nuclear, or large dams are state oriented, while biomass speaks the language of civil society. (Visvanathan 2007, pp. 199–200)

For Visvanathan (2007), fossil fuels, dams, nuclear power plants, and large wind or solar farms are neither the problem nor the solution because for him an energy transition comes into being only "when the laws of energy are rewritten" (p. 197). This radical refiguration of the proper location of reform is a problem not just for states, nor for the tribes and peasants of the world, nor for forests—it is, in the explicitness of its "challenge to the surreal science of elites who worship electricity" (p.198), a problem for us. As a salve, of sorts, Visvanathan enjoins us to consider, instead, a tree.

> A tree can either be an icon or an index. Iconographically a tree becomes a cosmology of connections. For instance, the coconut is a little cosmology, a network of connections linking myth, religion, economics, ritual, food, and agriculture. A coconut is a celebration of over 100 different uses. It is also a microclimate, creating its own minor ecology of plants. . . . *Science must think like the coconut*, link cosmology and system, and it is precisely this that the monocultural effects of modernity abandon. Monoculture is not only thinking of one kind of plant or tree. It is reducing it to a single one of its uses. When we reduce the forest to pulp, the answer is eucalyptus. (p. 207, emphasis added)

7. CONCLUSION: THE ENERGY METAMORPHOSIS

One might say of Ingold that he is thinking like a coconut. Gell (1988), whose remarkable and very short essay "Technology and Magic" I have not had space to cover here, is also very coconut. Visvanathan (2007) in this, his lone essay on energy, is totally coconutty. His is a theory, but also an essayistic praxis.

To move away from big men, who have spent a lifetime gathering mana to their names and causes, there is something special, it seems, about the sun. It warms the field, if in ways that are not explicitly causal. Studies of solar energy projects (Jensen 2019b, Badami 2021), or of community solar organizing (Lennon 2021), or of the overheating of the world (Eriksen 2019) do not abandon disciplinary strictures, nor would I advocate for doing so, at least not entirely (Bakke 2023b, Boyer 2023b). And yet it appears that as energy-dense "fuels" began to dematerialize into mercurial forces and harvestable qualia—sun's heat, wind's speed, the movement of waves and tides—anthropologists of energy are also changing. How we write is changing, as is how we

collaborate and communicate (see especially the admirably eclectic Howe et al. 2023). It is a co-occurrence, an energy metamorphosis, more than a transition or a transformation, such that today, regardless of what we set our minds to study, anthropologists of energy are also grappling with new approaches to and methodologies for the study of energy. Many are working in explicitly interdisciplinary teams or writing outside of traditional genres, edging toward becoming public intellectuals often by publishing in shorter more public-facing online sources such as *e-flux*, or, as with the immensely influential *Cultures of Energy* podcast, using media beyond print to communicate within and across disciplinary lines (Boyer & Howe 2016, After Oil Collective 2022, Timofeeva 2022).

I think of the present as a time in which ideas that have enflamed anthropology over the past decade—"the imagination" and "the future" or "the otherwise"—have, in the study of energy, lost some of their purchase, to be replaced instead with praxis—a doing that displaces (somewhat) the theorizing of what ought to be done. In this way, perhaps the anthropology of energy matters to the shifting of the discipline as a whole: It feels in 2025 as if the sun were finally beginning to dissolve the glue that binds us to the firmament of the twentieth century, allowing for a moment of disciplinary pause, such that we might look backward to early concerns of spirit and thing and forward to considerations of the work our own scholarly energies perform. In the anthropology of energy, we can see the field as a whole metamorphosizing for a new age—a bit more coconutty to be sure, and yet also retaining science, much as the pointy bits of Ingold's mix-rayed sun remain essential to the brightness with which it shines.

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