Routledge Studies in Rhetoric and Communication

THE RHETORIC OF OIL IN THE TWENTY-FIRST CENTURY

GOVERNMENT, CORPORATE, AND ACTIVIST DISCOURSES

Edited by
Heather Graves and David Beard

ROUTLEDGE

The Rhetoric of Oil in the Twenty-First Century

This book examines mass communication and civic participation in the age of oil, analyzing the rhetorical and discursive ways that governments and corporations shape public opinion and public policy and that activists reframe public debates to resist corporate framing.

In the twenty-first century, oil has become a subject of civic deliberation. Environmental concerns have intensified; questions of indigenous rights have arisen; and private and public investment in energy companies has become open to deliberation. International contributors use local events as a starting point to explore larger issues associated with oil-dependent societies and cultures. This interdisciplinary collection analyzes the global discourse of oil from the start of the twentieth century into the era of transnational corporations of the twenty-first century.

This book will be a vital text for scholars in communication studies, energy humanities, and environmental studies. Case studies are framed accessibly, and the theoretical lenses are across disciplines, making it ideal for a postgraduate and advanced undergraduate audience in these fields.

Heather Graves is Professor of English and Film Studies at the University of Alberta in Edmonton, AB, Canada, where she does research on argument in academic disciplines, the rhetoric of oil, the rhetoric of science, visual rhetoric, and the gamification of writing instruction.

David Beard is Associate Professor of Rhetoric in the Department of English, Linguistics, and Writing Studies at the University of Minnesota Duluth, where he researches rhetoric at the intersection of oral and written communication, popular and professional discourses.

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In mid-May of 2015, a picture, Neil deGrasse Tyson with his words typed neatly in black beside him, appeared on my Facebook feed.[1] Like many things that find their way there, it was unbidden, but unlike many it was not unwelcome. deGrasse Tyson is relaxed, all stone washed denim and kindly eyes above gently pursed lips. It's that sort of meme meant to evoke sensations of getting in trouble by your favorite 7th grade science teacher. You should feel bad, but only a little. It says:

> We're dumping carbon dioxide into the atmosphere at a rate the Earth hasn't seen since the great climate catastrophes of the past, the ones that led to mass extinctions. We just **can't seem to break our addiction to the kinds of fuel that will bring back a climate last seen by the dinosaurs, a climate that will drown our coastal cities and wreak havoc on the environment and our ability to feed ourselves.** All the while, the glorious sun pours immaculate free energy down upon us, more than we will ever need," says Tyson. "**Why can't we summon the ingenuity and courage of the generations that came before us?**
>
> **The dinosaurs never saw that asteroid coming.**
> **What's our excuse?** [2]

What Mr. deGrasse Tyson has so nicely captured here, is a pattern that pervades conversations about the energy transition in the U.S., which are cast with surprising frequency in terms of moving America away from its "addiction" to fossil fuels and ushering in a transition to an Edenic paradise where the wind and the sun provide all the power we need, plus some. All that is necessary in this scenario is that we harvest this sun and reap this wind. Bucolic pastoral verbs motivated for deeply industrial processes. As we see in this admittedly punchy excerpt, a wholesale swap of a fossil-fuel modernity for a renewably powered (alter-)modernity is rarely figured as a technological problem. Rather the transition is cast as a cultural one: why can't *we* break our addiction to oil? Why can't *we* summon the necessary ingenuity and cour-

immaculate and free, pour down upon us and yet we remain committed to something else: an addiction to fossil fuels that will bring back the climate of the dinosaurs, will drown our coastal cities, and wreak havoc on our ability to feed ourselves. In this story, the dinosaurs are not the slow-thinking, lumbering beasts doomed to extinction by their own failings. We are.

There is something similar in the story told by Georges Bataille in the first volume of his magnum opus, *The Accursed Share* (1988 [1949])—a work of political economy that considers not "the production and use of wealth" (20) of classical economics but the wise expenditure (or consumption) of that wealth (9).

Completed in 1949 after 18 years of research and writing, Bataille, like deGrasse Tyson, is concerned with the excess energy of the sun.[3] He, too, is worried about the social and political ramifications of *not* taking seriously the unceasing flood of energy it provides to the planet; he too is bombastic:

> The living organism in a situation determined by the play of energy on the surface of the globe, ordinarily receives more energy than is necessary for maintaining life; the excess energy (wealth) can be used for the growth of the system (e.g., an organism); if the system can no longer grow, or if the excess cannot be completely absorbed in its growth, it must necessarily be lost without profit; it must be spent, willingly or not, gloriously or catastrophically. (21)

For Bataille, then, the real problem is not producing or accumulating wealth—that comes about naturally by virtue of the sun's own shining[4]—the problem is, rather, how to dispense with the accumulated money, things, power, and fat (all subcategories for him of "excess energy," to which we might add CO_2 and CH_4) in a way that is not destructive to social and political worlds. How, he wanted to know, might humans waste more wisely? How, we might now ask, might humans avoid anthropogenic climate change wrought from a careless wastefulness and geologic in impact?

In this chapter, following inspiration from Kenneth Burke (Burke 1984, 1968), I appose (not oppose) the excesses of the sun as solution to (in deGrasse Tyson's case) and source of (in Bataille's) climate change. To do this, I focus on the energetic excess of fossil fuels, and oil most especially, as rhetorical, which is to say as a habit of thought made evident in the unfolding logic of persuasive arguments. My larger claim here is that both Bataille and deGrasse Tyson *think* and thus *argue* the sun, its potentials, and its powers, in terms of a logic borrowed from oil.[5] I make this case slowly, by layering strata of data, from section-to-section of this chapter. Each stratum might stand alone but when pressed into the

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Or, to put it in less obsequiously geologic terms, when speaking of the energy transition I have tired of the "oppositional strategies [that] are . . . so ably suited to convincing the convinced, and so thoroughly unsuited to anything else" (Burke quoted in Crusius 358). Such arguments proliferate on both sides of the green divide. Burke's solution to (his own) boredom with the questionable efficacy of opposition was to turn toward what he calls "perspective by incongruity" or the eerie, slightly jarring sense of seeing the same thing from two angles, simultaneously. At the sentence level apposition creates this layering of frames by placing two terms of the same order—usually a noun and a noun phrase—side by side, e.g., "My sister, the king," or, "Arrhenius, the thoughtful Swede." Rather than producing a sensation of depth (stereoscopically) or complexity (via opposition), apposition argues its case straightforwardly, by presenting the same thing from competing, and often disjunctive, vantage points (see also Long 1997).

One might think of the classic story of the five blind men arguing over the nature of the elephant, each only touching a piece of the beast. Apposition is the sense one makes by taking all these impossible competing stories together ("it is long and flexible and covered in hairs" argues the man handling the trunk) and building up from them. Each section of this chapter thus hinges on a single claim: the energetic excesses of oil, which are unique in human history, have ground a normative sense of how energy works down into the very fundament of the way we[6] now talk about and conceptualize energy (potential and actual). This normative sense shapes much of how those who live in energy intensive economies (including Bataille and deGrasse Tyson, Burke and myself) imagine what they are and what their world might profitably become.

First then, to Battelle's counterintuitive accounting of energy and economy.

"The Turbulence of the Bull"[7]

Because economic theories do not generally treat excess as a problem, but rather as a solution—poverty for example is assuaged by wealth, worse situations are bettered by further growth—the issue of how one dissipates or "exudates" excess energy (wealth) is not, Georges Bataille argues, given the consideration it deserves. In focusing our attentions on the endless increase of wealth as the solution to poverty his contemporaries (and our own) fail to see that "*it is not necessity but its contrary "luxury" that presents living matter and mankind with their fundamental problems*"(12):

> Minds accustomed to seeing the development of productive forces as the ideal end of activity refuse to recognize that energy, which constitutes wealth, must ultimately be spent lavishly (without return),

> and that a series of profitable operations has absolutely no other effect than the squandering of profits. To affirm that it is necessary to dissipate a substantial portion of energy produced, sending it up in smoke, is to go against judgments that form the basis of a rational economy. (22)

In effect, Bataille reverses the commonsensical notion of profit as hard-won and worthy of careful management to propose instead that increase-until-die-off is the natural order of things, and that humans need to be far more attentive to ethical modes of wanton wastefulness. This reversal of the order of things leads to two major (and, from Bataille's point of view, underappreciated) problems for human society. First, economic theories attend to the wrong activities—the furtherance of wealth, for example, rather than a more effective dissipation of the excess we have.[8] Worse, war and other forms of thoughtless waste, or "involuntary destruction" emerge because "our ignorance . . . causes us to *undergo* what we could *bring about* in our own way, if we understood"(23):

> It [ignorance] deprives us of the choice of an exudation that might suit us. Above all, [it] consigns men and their work to catastrophic destructions. For if we do not have the force to destroy the surplus energy ourselves, it cannot be used, and like an unbroken animal that cannot be trained, it is this energy that destroys us; it is we who pay the price of this inevitable explosion. (23–24)

Bataille is writing in the wake of World War II. He lived through the first as well. During the first half of the twentieth century, Europe might well have seemed a machine for turning the riches of industrialization into epic, bloody wastefulness. Its wars generated the horrors of unplanned exudation that gave rise to Bataille's theory, such that by the end of World War II he was certain of the link. "It is sometimes denied," he writes, "that the industrial plethora was at the origin of these recent wars, particularly the first. Yet it was this plethora that both wars exuded; its size was what gave them their exceptional intensity" (25).[9]

Allan Stoekl, who has written extensively about Bataille's work on energy and economy brings this point to its logical extreme—annihilation at a species level—saying:[10]

> A steady state, can be attained by devoting large numbers of people and huge quantiles of wealth and labor to useless activity [. . .] most notably, one can waste wealth in military buildup and constant warfare: no doubt this kept populations stable in the past [. . .] but in the present (i.e., 1949) the huge amounts of wealth devoted to military armament, worldwide, can lead only to nuclear holocaust. (2007: 37)

One might see four decades of unwinnable war in Afghanistan in this light or the waste that now goes by the name of Syria.

For Bataille, the law of general economy is thus that organisms must expend or find a way to waste—rather than guard or reinvest or render productive—what classical economics terms "luxury." The ethical move that he enjoins us to consider, given the inevitability of squander, is of finding ways to expend the accursed share without destroying worlds and lives with it. Plowing excess back into existing systems, by recycling it (for example) or rendering it otherwise and once-again productive do not count for Bataille as forms of expenditure. This is because such processes continue to recognize only what is recoupable. Nothing changes when waste is rendered fodder for the same blind excess-producing system, just as nothing is learned when waste is cast thoughtlessly aside and hidden from view (in a dump or a bank, for example). Industrialization has made this project harder and more necessary as the factory system's capacity to both produce wealth and process raw (and recycled) materials is unparalleled in the history of human and natural economies.[11] (The exception might be, as Bataille often mentions, the unrelenting growth of plants).

It is difficult, for those of us steeped in neoliberal accounting of all things, to even conceive of a systematized support for pure dissipation (what Bataille terms "the turbulence of the bull") given the amount of excess energy now available to us. Much of that excess comes from the particular capacity of oil to twist beyond all recognition the relationship between the necessary labor-time for its production and the energetic potential, or capacity to "do work," of the oil itself, a relationship that deGrasse Tyson replicates in his argument about the benefits of solar power subsisting in its capacity to "pour energy down upon us, more than we will ever need."

In making this call, deGrasse Tyson is thinking with the logic of oil: he is using crude thinking to motivate a discussion about a different sort of entity—the sun. Simply embracing the golden shower of infinite solar power as a solution to planetary fossil-fueled problems fails to clarify that solar power is *different* from oil.[12] This difference is not in terms of the electrons each can be made to make, but in the ways in which we harness their energetic capacities: the who, what, where, when, how, and how much of power (and with it, money) production. Such is my presumption here, that once the rhetorical grounds of crude thinking are made evident, new questions of the future might be asked. Foremost among these is: what happens to discussions of an energy transition if these are made to include Bataillian concerns for the proper and inevitable dissipation of unused energies? How, in other words, might we approach the intensification of the greenhouse effect as a direct consequence of disregarding plentitude?

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So Much Hot Air

The greenhouse effect, first sketched out in 1896 by the Swede, Svante Arrhenius, is not in and of itself a bad thing. It is what makes the earth supportive of life in all its diversity. It happens because the atmosphere traps about 90% of the heat, *not* of the sun directly but that which bounces back up from the earth after it has been first touched by the sun. The planetary environment becomes warm not just in one spot—where the sun's actual rays originally hit—but all over. Indeed, rather like a greenhouse, the air around us holds a kind of averaged (if uneven and turbulent) blanket of reradiated heat.

The composition of the atmosphere changes how much heat is trapped, giving rise, Arrhenius pointed out, to the occasional ice-age. He also suggested that the increase in carbon in the atmosphere that came from burning fossil fuels in all our newly (in the 1890s) ubiquitous heat engines could alter, and increase, the amount of radiated heat that got trapped by the atmosphere. Arrhenius, though not credited with inventing the concept of global warming, had already posited in the closing years of the nineteenth century that it was a plausible effect of fossil fuel use, a thing to watch, a thing to worry over.

As we now know well enough, the gases worth keeping a keen eye on are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).[13] All are released when coal, oil, and natural gas are combusted, and they also put in a fair appearance when oil and natural gas are extracted, transported, and stored. There are other sources for all of them: bogs, cow farts, volcanoes, and animals exhaling. All were present before mass industrialization (when we had more bogs and fewer cows), and there was something like an equilibrium in our skies; the planet stayed more or less regularly warm.

Today, we use a lot of all of these fuels, and as deGrasse Tyson rightly points out, we have built up industrial, agricultural, energy, and transport infrastructures that depend deeply upon their bounty. The lightness of what remains when they are burned, the odorless, colorless remnant of their plenteousness—their invisible excess—is weirdly hard to panic about. Unlike the accreting coal dust, acid rain, urban smog, and chemical leaks that gave rise to environmental movements in Europe and the United States in the 1950s and 1960s, greenhouse gases produce little sense of propinquity because cause and effect are so seemingly *unlinked* in the immediacy of experience. Use a gas lawn mower, and there is no freak ice storm taking down your power lines later that afternoon, though there might be an unusually destructive monsoon in 11 years in Bangkok.[14] The problem is planetary, which is a scale hard to get used to, and although the sun may be the solution, according to deGrasse Tyson, it is also the root cause of our fossil-fueled problem. This is because fossil fuels are also of the sun, congealed into the muck of earth, plants that grew and decomposed, animal bodies that grew and decomposed, carbon and methane that could have been released in the moment of death but were trapped instead in ice and rock-pockets, intensified by time and geologic pressures.[15] Global warming is thus a sort of radical time-shift of carbon emissions. What should have taken millennia to seep slowly upward into the air we've thoughtlessly released in little more than a century. It's been a good run, the effects of which stretch far beyond industrialization, factory capitalism, extractive capitalism, neocolonialism, neoliberalism, and war to include basically everything known and normal to contemporary life.

Muscular Economies

To understand how deeply contemporary figurations of abundance rely rhetorically upon congealed, rotted, compressed, and thusly stored (to become coal, oil, and gas) solar energy, it is worth considering ideas about economy that predate Arrhenius, the thoughtful Swede. So much of what feels natural (and I will concretize this "feeling" in the end) to people living in thoroughly industrialized economies today is, relatively speaking, new. Indeed, over the last two thousand years—or most of human history until about 1820—human economies grew very little, if at all. Growth for this period is figured at about 0.05% every year.[16] This means that people living in 1820 were only negligibly more prosperous than those living in 1020. By negligibly, I mean that they had things like a fireplace with a chimney rather than a fire on the floor in the center of the house. I mean also that they had a horse or a slave to pull a plow rather than having to do it themselves. Wealth was measured by the control of muscle power other than your own. "As late as 1750," Isaac Asimov writes, "man's use of energy was still largely that of muscles—his own and those of animals—and the heat given off by wood fires" (1972: 8). Over a century later, in 1870 in New York City, draft animals accounted for more than half the total horsepower produced by prime movers.[17] Today, the term "prime mover" usually refers to an oil or steam fed engine. A hundred and fifty years ago it still referred largely to calorie-fed muscle. For the most part, in the United States, this consisted of horse muscle and human muscle.

Here is a picture: It's spring, 1882 in Lower Manhattan, the streets are crowded with horses—draft horses pulling carts, the leaner harness horses pulling buggies and carriages, while teams of huge drays pull the streetcars. Vast piles of dung steam in the cool morning air. Hosts of English sparrows flit through the channels between buildings, a plague upon the city streets; they stop to feed on the seeds that the horses' bellies have left undigested (Yaeger 2011: 308). Horses, piles of horseshit, hundreds of sparrows. This was New York 150 years ago. The horses, as well as most of the people, crapped outside.

In a month's time when summer's heat and humidity hit, the city will stink. Every breath will smell of horse and sweat and backyard privies and the trenches alongside apartment buildings into which chamber pots are emptied; every step will sully the shoe and muddy the skirts of those who rush across streets or who have just stepped out lightly from a carriage. It was into this morass that Edison began the task of building America's first DC electric grid, a smallish thing by today's standards, about a square mile around Wall Street in lower Manhattan.[18] It took years before the first bulbs were set aglow in the offices of America's richest men (and those of *The New York Times*, and by luck or plan, those of Edison's own lawyer) but for the most part these years were spent not in the lab perfecting the various components to make this grid function, though that is how the story is usually told—the genius inventor hard at work with brain and hands far from the thick stink of urban life. Another narrative runs parallel to this: that of mucking about in the streets, that of laying the lines. For in this first-square mile given over to electrification, *men* were pulling up cobbles to dig a long straight channel through the dirt and rocks beneath. Into these ditches they laid wires, each carefully wrapped in an unproven insulator. They then piled the dirt back on and relaid the cobbles on top.

In the spring of 1882, they'd been at the task for over a year. Some streets had been dug two or three times. The wires laid were encased in conduits and these were given to leakage—they were after all the first of their kind—causing small fires and big shorts. Every short meant pulling the cobbles back up, re-digging down to extract the faulty elements and relaying the electrical conductor. It was not a thankless job, though it might sound so to modern ears. This is just how it was in the 1880s; this is how America's electric grid, like many modern conveniences, was built, whether in New York or Muncie or Los Angeles. Muscle built, dug, and pulled; muscle ate, muscle sweated, and muscle shat. Human muscle and horse muscle, mostly (Figure 3.1).

Between the mid-1800s and the present day, world per capita income has increased 20 times faster than it had in the preceding eight centuries (see esp. Broadberry et al. 2015). In 1820, a chimney was a good thing to have, and burning charcoal was a nice but dirty alternative to wood; in 1970—a mere 150 years later—the vast majority of Americans had centralized heating or cooling (or both) depending on where they lived. In some regions, like the Pacific Northwest, this heating and hot water were supplied by hydroelectric dams; in others, like the Northeast, it was oil that fed the basement boilers that warmed people's homes (Figures 3.2 and 3.3).[19]

And if calorie-fed muscle still provided most of the power that moved our world in 1880, a mere 30 years later, the horses, their crap, and the sparrows that had fed upon it had disappeared from New York City's streets. Oil-fed motorcars had replaced horse drawn carts and carriages, while electric streetcars had replaced their muscle-driven precursors (Figure 3.4).

Figure 3.1 A horse team hauling the first generator to the Mill Creek #3 Hydroelectric plant, California ca. 1903. Reprinted courtesy of The Huntington Library and the papers of Southern California Edison.

Figure 3.2 Line crew with horse drawn wagon erecting a transmission pole in the desert with a derrick and gin pole, California ca. 1903. Reprinted courtesy of The Huntington Library and the papers of Southern California Edison.

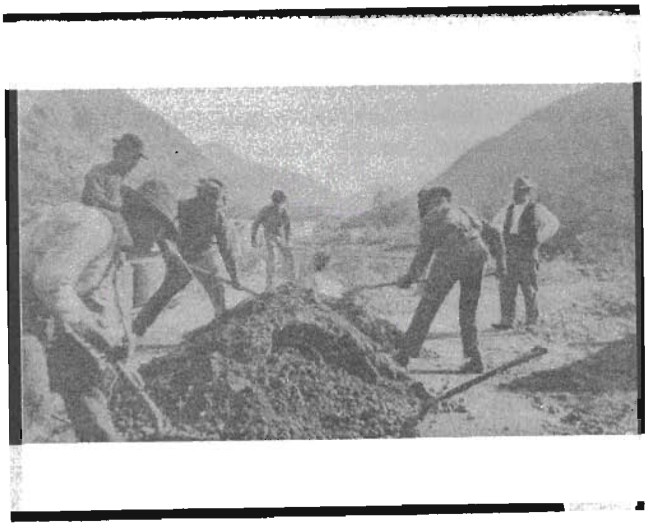

Figure 3.3 A construction crew making cement at the Mill Creek #3 generating station, California ca. 1903. Note the man with no shovel, who directs (and presumably also pays) the muscle. Reprinted courtesy of The Huntington Library and the papers of Southern California Edison.

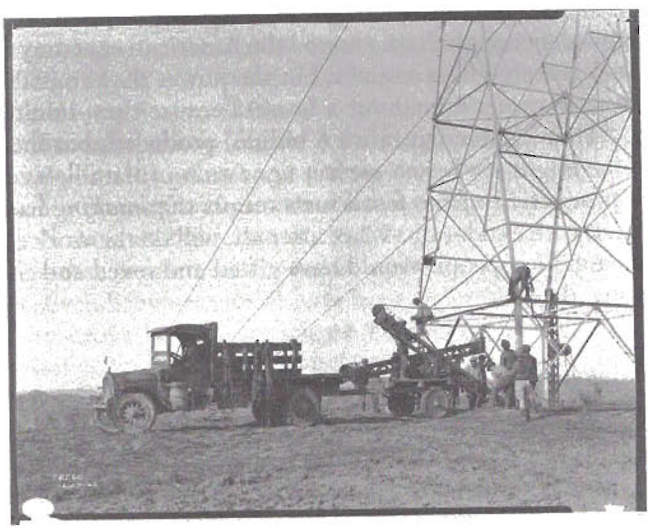

Figure 3.4 Enter the internal combustion engine. Big Creek Transmission Line, California 1922. Reprinted courtesy of The Huntington Library and the papers of Southern California Edison.

By the late 1920s *very* rich people in every urban metropolis in the nation had electric refrigerators, electric lights, electric irons, and a car.[20] By the late 1950s almost *everyone* had these things.

A report in the Edison Electric bulletin of 1942, when America was entering the seventh decade of electric power, points out that the horsepower available to factory workers had increased from three horses' worth in 1914 to the equivalent of 6.5 horses in 1942. Still an imaginable quantity of horses. The difference was that by 1942 electricity was supplying most of this horsepower. When the bulletin switches its unit of measure from horsepower to manpower, electricity made it seem that 6 billion more sweating, pushing, pulling workers had entered the economy—"equivalent to 50 slaves for each man, woman, and child."[21]

Different energetic regimes give rise not only to different material worlds and economies but to different rhetorical imaginaries. Horsepower as a measure of potential energy use might still be a term in circulation for everything from vacuum cleaners (at 4 horses) to mac trucks (at 425 horses), but slave power, equally common in everyday parlance until the mid-twentieth century, thankfully no longer has any place in conversation. Notable, however, is that both horses and slaves are ways of speaking about energy and its mastery that predate fossil fuels. Both harken back to an era *before* growth was an economic norm and when bodies did most of the work. Both became figures of speech—or energetic *imaginaries*—as the combustion of fossil fuels became the principle way of making power. Gas moves that mac truck; electricity runs that vacuum cleaner. Even odds, even today (2018), that that electricity is made from coal or natural gas. The power of 6 billion human-equivalents might have entered the American economy by means of fossil fuel-powered heat engines, but the power they contributed was distinct from that of a human (or a horse) because they didn't consume anything. "They" (these figurative 6 billion) produced, but they did not expend. One might see here a perfect figuration of Bataille's complaint: increased productivity from fossil fuels means that *making* has gone all out of whack with exudation. Who, after all, will do the work of wasting what those 6 billion people would have gifted and sexed and gobbled up just by being alive?

Horses, Slaves, Oil

According to physicist, Jacob Lund Fisker (who is now an early retirement activist): "There are various ways to do work. The most 'primitive' method is to eat food, which contains energy stored in the chemical bonds of fat, protein, and carbohydrates, and then use muscle power" (2005: 82).[22] "The rate of biological energy use (or the metabolic rate) of a human is about 100 watts, equivalent to 2,000 kilocalories per day."[23] Though this is expandable by eating more food, it cannot be increased indefinitely, since "human physiology restricts the amount of work which can be done to about a maximum of 180 watts, making it impossible to do more work just by eating more food" (Fisker 2005: 82).

Let's put this hypothetical human to work, for 10 hours a day at somewhere between resting and maximum wattage. This gives us something like 140 watts or, if we round up slightly, 1.5 kilowatts. That is the energy usage of a hardworking human. 50 men digging (see Figure 3.3) at this rate brings the total to 75 kilowatts of manpower, which was what electricity made available to "each man, woman, and child" in 1942.

In 2015, according to biologist James Brown, in "the most developed countries, our average per capita energy use is on the order of 10,000 watts [or 100 kilowatts] or 100 times greater than what we need biologically."[24] The total energy usage of "an average person in the United States, Canada, the Eurozone, or Japan is equivalent to the biological metabolic rate of a 30-ton primate. About 80 per cent of this extra-biological energy consumption comes from burning fossil fuels" (Brown et al. 2015).

Muscle is still a part of the imaginary how much potential-for-work (what laymen call 'power') is available to the "average person" but the metaphor of choice has changed. Rather than conceptualizing energy consumers as hypothetical slave owners—as was still the case in the 1940s, a shocking *eighty years* after abolition (in 1865)—with 67 hardworking slaves' (or 99 if they sit in front of computers) energy consumption is conceptualized as a correlate to body mass. To articulate the impact that fossil fuels have had on our consumption patterns, we can thus say that by means of fossil fuels we have increased our own putative mass. We no longer control the labor of others; we are now integrated, if obscenely big, selves; we are fossil fuel-consuming monsters, equivalent in energy consumption to the largest land-based mammal ever to have lived—the *Baluchitherium* (Figure 3.5).[25]

This is not, for Brown, merely a metaphor. We are, in point of fact, plottable on a metabolic chart that continues the "canonical" relationship between the metabolic rate of animals (i.e., the correlation between the calories that an animal consumes and the watts it produces) and their mass. Even Brown seems to have been surprised by this. Originally, his curiosity drove him to investigate whether there was a correlation at the level of national economies between GDP and fuel consumption, taking into account the caloric intake of a population on average and its energy consumption from other sources, like electricity and gas. He posited that "Just as a body has a metabolism that burns food energy to survive and grow a city, a national economy has a metabolism that must burn fuel in order to sustain itself and grow" (Brown et al. 2011: 22).

What Brown found when he plotted per capita energy consumption in watts versus per capita GDP was that the "slope or exponent 0.76 is close to three quarters, which is the canonical value of the exponent for

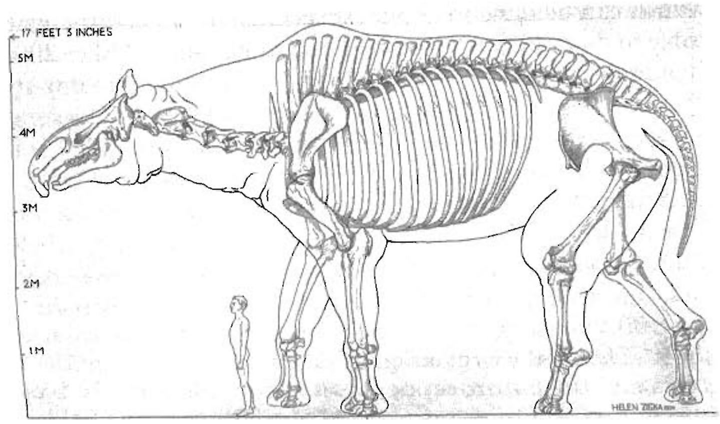

Figure 3.5 "The largest land mammal that has ever lived, the Baluchitherium, was a relative of the modern rhinoceros. Its body weight has been estimated at about 30 tons." From Schmidt-Nielsen 1984: 5, reproduced here with courtesy of the Library Services Department, American Museum of Natural history.

the scaling of metabolic rate with body mass in animals" (2011: 20). In other words, a contemporary American man, woman, or child really is calorically speaking a *Baluchitherium*. We are no longer a 2000-calorie per day (or 100 watt) being. We are a 10,000 watt being, but since we do not each weigh 30 tons, that extra wattage is not, indeed cannot be, supplied by food. It is not energy from calories. It appears, in fact, to be energy from fossil fuels (oil, gas, coal—not just essential to making electricity and heat; not just there to get a car to go, but also critical to manufacturing, to building materials, plastics, fabrics, polymers and getting food stuffs from one place to another) (Figure 3.6).

Brown's formulation is instructive not only because it demonstrates that the imagination has finally abandoned slavery as the truest metaphor for harnessing the work of others, but also because it acknowledges that fossil fuels are a great enabler (Brown et al. 2015). It is not that we control the labor of others, the energy, or—to slip quietly into Karl Marx's terminology—"the labor-time" of between 75 and 100 other humans; it is that we have, with oil most especially but fossil fuels more generally, happened upon what Marx in volume three of *Capital* calls "A Free Gift of Nature to Capital."

Although Bataille roots the causes of excess in industrialization and the 100 years of peace [1820–1914] that came with using excess energy to make factory capitalism work, with Marx we can take the source of excess back a step, to the extravagancy of fossil fuels, a free gift of

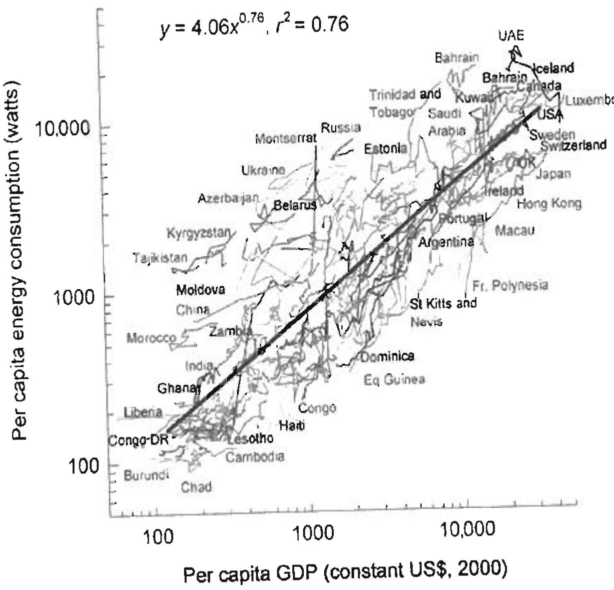

Figure 3.6 "If we were to expand this chart to include species of animals measuring energy consumption in watts converted to calories and body mass (in place of GDP), the slope, or exponent, would remain constant." From Brown et al. 2011. Reproduced with permission of Oxford University Press.

nature beyond human conception in the late 1800s, when Marx was penning his tome (1863–1883):

> Natural elements entering as agents into production, and which cost nothing, no matter what role they play in production, do not enter as components of capital, but as a free gift of Nature to capital, that is, as a free gift of Nature's productive power to labour, which, however, appears as the productiveness of capital, as all other productivity under the capitalist mode of production (Marx 1993).

This free gift as it relates to oil, spectacular even among fossil fuels, is explained by Michael Ziser, an English Professor in California:

> The mining of coal, which must be brought by brute force from seams buried far below ground epitomizes the zero degree of labor [. . .] and underscores the ultimate dependence of even an advanced industrial society on the input of *human* energy [. . .] Oil by contrast [to coal], is a liquid that in the classic scenario flows to the surface almost of its own accord, gushing out in all directions and

> proposing an entirely different relation among labor, consumption, and the body. Once struck, oil returns so much more energy than is required to produce it that it becomes an effectively costless substitute for human and animal labor. [One that] far exceed[s] what Marx [. . .] thought possible for a raw material to contribute to economic production. (Ziser, 321)

Following Ziser, it can be said with accuracy that the phenomenal—indeed, excessive—growth of human economies and capacities between 1860 and 1970 was due to the difference between the labor it took to extract and refine oil and the BTUs (heat) it produces.[26]

The "free gift" can be quantified by working out the difference between how much energy flows up of its own accord from a well and how much muscle power as a unit of energy (or Marx's labor-time) it takes to manage the process.[27] What is more, this relationship, or more properly speaking "ratio," between invested labor versus extracted energy has, since 1860, become a "natural" or commonsensical way for people (qua *Baluchitheria*) around the 10,000 watt mark on Brown's chart to understand first, the potential productivity of energy systems (like solar) and second, themselves and their weighty capacity to have an impact on the world (By which I should mean the wise deployment of their labor-power as the largest land animal ever to walk the earth, but the image I have instead (à la Bataille) is of the (impact) crater a 30-ton *Baluchitheria* would make when dropped from a great height).

As oil goes out of vogue because of the geopolitical complexities related to its movement around the globe and environmental catastrophes linked to its extraction and combustion, we can see in Bataille's work and the green energy dreams of deGrasse Tyson, that the magic of this "ratio" remains lodged in the imagination as we, *Baluchitheria* move forward to newer forms of sustaining our bulk—like the wind, the sun, and even natural gas. The excess of oil has, in other words, been naturalized as a conversation about growth and about the maximization of profits.

The easy question, to which most green energy dreamers set themselves, is: how might the energy needed to sustain, indeed grow, this non-negligible 10,000-watt beast be newly made? We might also wonder following Bataille: how might the feculence and lustiness of such 30-ton creatures be included into postulates for new society—one that not only changes how it makes power but also how it deals with waste.

Math

The numbers for operative oil wells are hard to find. The number of barrels of oil that are produced per day, for example, and the number of people involved in the production process are—while not exactly secret—not exactly public either. The explosion of the Deepwater Horizon in 2010 changed this. A lot of facts leaked out in the public domain together with all that crude. We know, for example, that when the Deepwater Horizon blew up, there were 126 people aboard the platform, and that before the well was capped, it was leaking the equivalent of 63,000 barrels of oil per day.

There are between 125 and 140 kilos of oil (or 132.5 kilos on average) in a single barrel, depending on the type of oil. Multiply this by 2.2 to convert the number from kilos to pounds and we get 291.5 lbs of oil per barrel. For the purpose of argument let's round it up to 300 lbs of oil per barrel. Multiplying this by 5.8 kilowatt-hours per pound gives us about 1,700 kilowatt-hours per barrel; if we multiply this, in turn, by 63,000 barrels of oil released per day by the Deepwater Horizon, we can deduce that the well was producing the equivalent of approximately 107,100,000 kilowatt-hours of potential energy per day. So that's the oil side of the equation. One hundred and seven million potential kilowatt-hours per day (or roughly the output per day of 100 nuclear reactors)[28]

Here is the human side. 150 watts of human labor per hour multiplied by 126 people and 10 hours of work per day equals 189,000 watt-workdays. Then, we add 14 hours resting at 100 watts per hour and we get 1,400 watts per day per person, or 176,500 for everyone living aboard the platform. The energy output of the men who work the well is thus equal to 189,000 working watts plus 176,500 resting watts which comes to 365,500 watts or 365.5 kilowatts per day.

The free gift of nature to capital is thus 107,100,000 kWh minus 365.5 kWh, or 107,099,634.5 kWh.

Or, to make the scale of things maximally clear, the necessary labor-time to produce 63,000 barrels of oil a day is the equivalent (in watt-hours) of the potential energy of just *one quarter of one barrel* of that oil per day. The free gift is the energy equivalent of 62,999.75 barrels of oil per day. Or 250,000 times the labor energy per day is necessary to extract it.

For this ratio to be fully accurate one would also have to take into consideration the non-negligible labor costs of extracting the raw materials for the platform as well as the labor that was used to build it, move it into place, and govern it. Even so, drilling for oil is clearly a winning game in classical economic thought precisely because of the radical imbalance between labor-power in (measured in watts) and potential power out (also measured in watts).[29] Oil produces luxury almost as a side effect. This luxury enters an economic system premised upon a sort of capitalist accumulation (following Marx(1993)) or self-interested activity (following Smith(2000)) designed to maximize and centralize wealth among the few. Wealth that even before the excesses of oil found its way into industrial systems in the 1860s must (according to both theorists) be dealt with by government-mandated systems of redistribution—radical gifting forced by law upon the rich. There was, in other words, already a dissipation problem before oil. And then oil magnified this problem two hundred fifty thousandfold without a concomitantly radical plan for the squander of this excess.

How to get rid of so much? Bataille's endorsement of nonproductive activities, like the arts, sex without procreation (a delicious recuperation of what Freud had called simply "perversion"), potlatch-style gifting, spectacle, and other "sumptuous moments," are hard to operationalize at this scale. Vicious war, he saw, was an outcome. Global warming, I suggest, is another.

Crude Thinking

I am certain the numbers presented above have been figured out before, and more accurately, and that I could have zipped down a ratio from the Internet and pasted it in here with much less fanfare. What I wanted to get at, though, was the stakes of such figures for the ways in which we talk about renewable energy as *more* capable of excess even than the system we currently have.

The naturalized excess matters to questions of how one might best govern an economy, but it also matters to the imagination and after 150 years of oil, a free gift of nature beyond any assumed by classical economics (though I suspect that it is not an accident that Marx arrived at this concept just as oil was changing capitalism in entirely unanticipated ways). The once inconceivable excesses of oil have established as normal a particular relationship between necessary labor-time and available energy. It seems impossible that 126 men can produce over 250,000 times their calorie-driven energy per day, yet the minor excesses of everyday life (like disposable coffee cups of which Starbucks alone produces 4 billion per year; or incandescent light bulbs which use only 5% of the electricity it takes to run them to make light, the other 95% is given off as waste heat) attest to a certain facility in the modern dissipation of excess energy. It seems similarly possible that the wind blowing, the tide moving, the sun shining might do the same with no men, with no muscle much at all involved in the daily operation of things.

Here we might remember Burke for a moment as oil shape-shifts to suit one discourse and then another, providing inspiration here, fodder there, and then energetic capacities to power economies, and also impossible-to-imagine (but true) ratios, as it (in yet another way) contributes to a felt self-concept of modern man (woman, and child) as equally impossibly humongous beasts of the rhino family—raised from extinction as fossils are from their beds of stone, to walk/power the earth once again. Its apposition, not of two terms but five or seven, each set next to the rest to constitute a world of oil, a world harder to leave behind than deGrasse Tyson might imagine because it is so impossibly thorough.

One route, then, to understanding the appeal of the energy transition that is currently underway is to acknowledge that oil helped to put in place and grind down into consciousness the "naturalness" of the free gift. And now, in an odd way, oil has not become "free enough"—still too linked to the terrestrial, the bellicose, and the dirty. It has lost a lot of its appeal culturally, while still maintaining all of it chemically, all of it rhetorically. Even the charm of renewables is driven by a desire to return to fuels that might maintain the excesses of oil coupled with a further reduction in (accidental or unavoidable) waste. This includes the waste and pollution from oil spills, from internal combustion engines, particulates, and carbon and methane emissions. Renewables command cultural appeal because they demand even less muscle than oil for (hopefully) even greater return. The fear, of course, is that the ratio of invested to extracted energy that applies to renewables will be nowhere as favorably disproportionate as that of oil. The promise is that with time and earnest pursuit it will come close to or (as dreamers inevitably dream) exceed the favorable ratio presented by oil extraction, thereby allowing us to consume power at an even more accelerated rate than the largest land animal ever to have walked the earth. James Brown's curve extending endlessly upward and to the right, a forty-five-degree angle without end and without limit. With renewables, we dreaming 10,000-watt beings might become as large as the dinosaurs deGrasse Tyson uses to threaten us with—increasing not only the wattage available to us, but also the majesty of the free gift. Not 250,000 times the power out for every unit of human labor invested, but an infinite multiplication of what man can do with very close to nothing at all. In other words, we don't want 10,000 watts, the top of Brown's chart in 2011 to be the end of the story of growth.

In this I wager that we don't see that there is a story that continues to be told, a story of a natural "energetic" order of things that proceeds from oil, that relies upon crude thinking, and is perpetuated in imaginaries of an oil-free future in which the social values of the late twentieth century are left untouched by as radical a transition of energy regimes as humanity has heretofore manufactured. It will be this oil world without oil in it—lovely in its continued, sanctioned blindness toward excesses unconsidered. It remains a question if even a 10,000-watt being can dissipate in lively, desirous, flagrant uselessness 250,000 times the energy it takes to make itself whole.

Notes

1 An earlier version of this paper "The Immaterialization of Power: The Case of Electricity" was presented at Center for Energy and Environmental Research in the Human Sciences (CENHS) Cultures of Energy conference, Rice University, Houston Texas, April 16–18, 2015. Many thanks to all involved for their enthusiasm, wit, and comments. Thanks also to Benjamin Johnson

for help at the end with the physics and for doubting Bataille every step of the way.

2 This quote is from the ninth episode of deGrasse Tyson's popular science show, *Cosmos: A Spacetime Odyssey*. Emphasis in original meme, which can be found here: https://me.me/i/mediamatters-org-we-are-dumping-carbon-dioxide-into-the-atmosphere-at-4397331/ accessed Feb. 18 2019.

3 The remaining volumes were reconstructed from notes posthumously.

4 Wrapped up in this adverb "naturally" is great debate, as the question for humans is not how much sun hits the earth but how much of it we can channel to our own uses with processes like industrial food production or solar electricity production. See esp. Stoekl 2007:38–42.

5 Slavoj Žižek would call this (or something similar to it) the parallax view. His interest is less in material disjunctures and more in the space between a thing and itself (Žižek 2006). What I like about Burke's approach, however, is the place for play, absurdity and humor (My sister, the king?) and its reliance on a grammatical form which is both commonplace and comfortable.

6 This « we » is given precise definition right around Image 5, of the current chapter.

7 Bataille, George. 1988 [1949]. *The Accursed Share*, 28.

8 Neoliberalism as an ethical as well as an economic system would have been a blindingly obvious example of this for Bataille.

9 It could well be argued that we don't have excess as a planet so much as a society. There are pockets of excess (in Europe, for example, during the twentieth century). Therefore, distribution across societies, as a form of gifting, could be a solution as much as more bellicose modes of dissipation. This only works, however, following a Bataillian logic, if what is given is *not* destined to be channeled into increased productivity elsewhere. Development programs that shuttle money from rich to poor nations are not thus modes for dissipating excess but rather for spreading modes of capitalist increase.

10 In 1949, four years after nuclear bombs had been dropped on Hiroshima and Nagasaki in the final days of World War II, the proliferation of such weapons seemed to spell a likely end to human life on earth. Today global warming is the weapon we turn upon ourselves. Despite the fact that the means have been updated, the story remains very much the same.

11 It is worth noting following Mintz (1986) that the factory system was also remarkable for its capacity to strip energy from persons and plants, and following Li (2014) that it was also a perfect machine for the production and increase of inequality. See also Freeman, Joshua. 2018. *Behemoth: A History of the Factory and the Making of the Modern World*, New York: W.W. Norton & Co.

12 Stoekl points out that Bataille too makes this mistake of thinking the sun by means of the energetics of oil (2007: 39), but he (Stoekl) is writing at a time before solar power technology became a viable means of making electric power, so his critique of Bataille's ignorance is bolstered by his own placement in time and the energetic truths then available.

13 All the NOs (N_2O, NO and NO_2) actually contribute to global warming, such that the term NO_x has entered circulation. Useful in many ways, none I wager, are quiet so charming as the potential of "NO to NO_x" as an addition to the lexicon of protest banners.

14 A gasoline powered lawn mower emits about 48 kilograms (106 lbs) of greenhouse gas in one season. Gas-powered lawn mowers are very inefficient,

which means that despite their small size they produce a lot of air pollution. In fact, running an older gasoline-powered lawn mower for one hour can produce as much air pollution as driving a new car 550 kilometers. Source: Ministry of the Environment-Canada

"A gasoline-powered lawn mower run for an hour puts out about the same amount of smog-forming emissions as 40 new automobiles run for an hour." Source: California Environmental Protection Agency, Air Resources Board. May 20, 1999. From http://www.cleanairyardcare.ca/sustainability/environmental-facts/ accessed Aug. 31 2016.

15 "Scientists have long known that permafrost contains vast quantities of carbon in dead plants and other organic material, about twice as much as the entire atmosphere. Now, that permafrost is melting more quickly as the Arctic warms up faster than anywhere else on Earth. The melt often takes place in Arctic lakes where water thaws long-frozen soil. The material released is digested by tiny bugs and turned into carbon dioxide and methane . . . The team captured some of those gases and subjected them to radiocarbon dating. They found the gases had been generated from carbon stored for anywhere between 10,000 and 30,000 years" (Weber 2016).

16 "Better and Better: The Myth of Inevitable Progress" by James Surowiecki in Foreign Affairs July/August 2007 (accessed 3/2012); It is a review essay of Indur Goklany's book *The Improving State of the World*, p.1; See also Maddison, Angus *Contours of the World Economy 1-2030 AD: Essays in Macro-Economic History, Oxford: Oxford University Press, 2007.*

17 Quote from U.S. Dept of Energy, *Annual Energy Review 1998*. 1999. Washington, D.C.: U.S. Department of Energy (Energy Information Administration): xviii.

18 For a longer more detailed discussion of this process, see Bakke 2016.

19 To begin with a point of comparison, on average oil produces almost 21 megajoules, or 5.8 kilowatt-hours, of energy per pound. Burning wood produces about six megajoules per pound, or 1.6 kilowatt-hours. Coal gives between 7 and 16 megajoules per pound depending upon its quality. A joule is defined as the work required to produce one watt of power for one second (one watt-second). A kilowatt-hour is thus about 3.6 megajoules. An average American household uses 1000 kilowatt-hours per month or 3,600 megajoules.

20 In NYC in 1920, there were only 150 home refrigerators (Nye 2010: 228).

21 Madrigal (2008) U.S. population in 1940 was 132 million people x 50 slaves = 6.6 billion people. In a way, the mainstreaming of electricity or electric power proved Malthus wrong, 6 million more workers, but no more mouths to be fed.

22 Fisker is now, curiously, an early retirement activist; still a student of "work," if differently.

23 Some say 130 watts (see Brown et al. 2015).

24 It is actually 66.67 times greater than we need biologically [100/1.5 = 66.6667]. For context, the most basic model of the new Tesla power wall battery system is 7.5 kilowatts or five times a hardworking human. This is not quite Marx's labor-power but it is a simple means of quantification. A $3,500 battery could in 2016 supply a house with the equivalent wattage of five working men. We might also say, to update the metaphor, that it supplies the power of a single muscular man with the tonnage and wattage of a small male giraffe.

25 Blue whales are 3x this size, but the water enables their bones to support their weight.

26 For purposes of conversation 1 BTU (or British Thermal Unit) is the rough equivalent of one kilojoule [1 BTU = 1055 joules]; 1000 BTUs is thus roughly a megajoule [947.82 BTUs = 1 megajoule]

27 A minimal investigation of oil fields will reveal that it is not quite so easy as Ziser claims to get that oil out of the ground, these spaces reverberate with sound of generators and screws pumps, as fossil fuels are mobilized to raise other fossil fuels from the earth. They are loud enough that the birds have changed their songs to carry over the clamor of industry (Tabuchi 2018). Anthropologist David Hughes makes a similar claim in "Ordinary Oil: Energy, Climate Change, and the Silence of Complicity" (a manuscript still in process) in which he argues convincingly that the notion of oil coming naturally to the surface *as if* mobilized by a sort of anthropomorphic antigravitional "desire" is a part of oil's mythic rather than physical structure.

28 Most nuclear reactors produce in the area of 1000 MW.

29 I have intentionally omitted the labor-power and material costs of transporting this oil to market and running the business end of things as related to this transport and sale. While necessary to produce an economy dependent on oil, it is not necessary for the quantification of the "free gift."

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