



Spaceship Archeology: Methodological Experiments in NSF Counter-Insurgency at the 2017 Oregon Eclipse Festival

Scott W. Schwartz^a , Matthias Neumann^b and Catherine Grace Rehwinkel^c

^aCity University of New York, Graduate Center, New York, New York, USA; ^bCity College (CUNY), New York, New York, USA; ^cInteractive Telecommunications Program (NYU), New York, New York, USA

ABSTRACT

This article examines several aspects of knowledge production among practitioners of 21st century capitalism, critiquing the motivations, funding, methods, and dissemination of today's politically and economically dominant epistemology. We document a methodological experiment undertaken during the Oregon Eclipse Festival—a week-long event coinciding with the solar eclipse that crossed the United States on August 21, 2017. As commissioned participants in the festival's Art & Science exhibit, we designed an interactive archeological excavation that sought to produce material evidence corroborating the (un)reality of UFO activity in Oregon. From this performance, we highlight four insights into the relationship between science, evidence, and responsibility.

KEYWORDS

Capitalism; epistemology; STEM; STS; UFOs

Introduction

On August 21, 2017, a narrow band of the United States had the rare pleasure of seeing the sun entirely blocked out by the moon for about ninety seconds. Reveries and celebrations were organized across this path of totality from Oregon to South Carolina. The esthetics and audiences of these various festivals were rather diverse—from educational to spiritual to recreational. One such event that aspired to include all this and more

CONTACT Scott W. Schwartz  sschwartz@gradcenter.cuny.edu  City University of New York, Graduate Center, 365 5th Ave., New York, NY, USA.

was staged in Big Summit Prairie, Oregon by a syndicate of arts festival organizers from around the globe. This 2017 Oregon Eclipse Festival was hailed by *Compose Yourself Magazine* as the “most transcendental event in the known universe.”

Among the estimated 30,000 people in attendance were visual and sonic artists, gurus from around the world, indigenous communities, lecturers in spirituality and consciousness, and a small group of self-described Guerilla Scientists. Just beyond the Moon Gate, between the Dance Shala and the Silk Road, on the ridge overlooking the neon electricity rhythms pulsating out of the Sky Stage, the Guerilla Science crew set up shop with the stated objective of “connecting people with science in new ways.”

Guerilla Science, a U.K. organization, financed its appearance at the “Burning Man for eclipse-chasers” via funding from the U.S. National Science Foundation (NSF) to promote interest in STEM education (education focused on Science, Technology, Engineering, and/or Math), specifically among populations who may be skeptical of EuroWestern science as a privileged form of knowledge production. As residents with the Guerilla Science program, the authors undertook an excavation of the festival grounds searching for material evidence of UFO activity in the area. Our methodology was rigorous and sincere—all profiles and contexts were planned, soils were sampled for entomology and flora, elevations were recorded, and the finds register was meticulously updated. Additionally, we asked festival-goers to share thoughts or experiences regarding UFO phenomena as an informal ethnographic endeavor.

Drawing on this fieldwork, the primary goal of this article is to examine the motivations, methods, and impacts of knowledge production among capitalizing populations (those that practice perpetually accelerating asymmetrical growth of wealth). There are three overlapping groups of concern: (1) those that produce knowledge; (2) those that communicate knowledge; and (3) those that are targeted for the dissemination of knowledge. This multi-pronged research project was particularly well-suited to the 2017 Oregon Eclipse Festival, as all three of the above groups congregated under the Guerilla Science tent.

We frame this work around the concepts of evidence and responsibility. What is considered valid evidence among different populations? What evidence is dismissed by empowered knowledge producers as irrelevant and erroneous? As incorrect as any truth claim may be, it is implicitly based on some evidence—a hunch or wayward advice. Is such evidence bad, wrong, untrustworthy, unreal? To nuance this framing we offer a brief overview of the history and philosophy of science and its relation to responsibility.

Building off this framework, the article presents what we perceive as four principal insights into the motivations, methods, and impacts of

knowledge management among capitalizing populations. First, the reality described by science and critiqued by art for the past few centuries has been commandeered and compressed by the practice of marketing (i.e., marketing is the primary source of evidence for knowledge claims among the capitalizing). Second, government and nonprofit funding for the promotion of STEM education is not pursued as a means of cultivating a more informed and educated public, but rather a more profitable public. Third, conspiratorial thinking that is perceived as detrimental by many STEM advocates is actually encouraged by the dominance of scientific knowledge production. Finally, the methodological and theoretical tools of archeology offer an approach for reconciling perceived divisions between material and discursive evidence. Before addressing these four insights we provide background on our entanglement with Guerilla Science and a discussion of methodology.

Given the breadth of concerns this article addresses, it is neither theoretically nor methodologically situated clearly within any discipline. Rather, by engaging with the semiotics of marketing (Insight #1), science and technology studies (Insight #2), the philosophy of conspiracy (Insight #3), and excavation (Insight #4), this work is necessarily an anti-conclusive demonstration of how researchers flexibly make knowledge in concert with the groups they study (Fabian, 1983). As such, this article is performed somewhat effervescently in order to denormalize narrative approaches to interpretation.

Background

In the spring of 2017 Guerilla Science held an open call for an Art-Science residency. Accepted participants were commissioned to create “transformational experiences” for Oregon Eclipse Festival attendees—an audience identified as being “distant to science.” Applicants for the residency were encouraged to propose edgy exhibits and themes that challenged notions of science as staid and inaccessible. To these ends, the authors proposed a participatory archeological excavation to look for evidence of UFO activity in Oregon. Key to this project was the idea that interpretation of the evidence would not be a top-down, expert driven endeavor, but rather a community-based negotiation. The archeologist among us would not decisively dictate whether the collected material evidence confirmed or denied the presence of UFO activity. This approach adhered to Guerilla Science’s prerogative to bring science to the public in an interactive manner.

Prior to the festival, a series of workshops on the practice of science communication (“SciCom”) was held at Pratt Institute, an art school in New York. These workshops offered instruction on how to draw audiences to our exhibits and allowed us to rehearse our projects. Many of the

residents had well-honed projects they had performed at festivals like Burning Man, Symbiosis Gathering, and Figment. Guerilla Science's vision for these residencies was to pair artists with scientists, the idea being that the artist would create a stimulating translation of the scientist's institutionally specialized knowledge. The composition of the authors' team conformed to these parameters if one considers archeology a science—a long-standing disciplinary point of contention (Binford & Sabloff, 1982; Earle et al., 1987).

Methodical Perambulations

As recipients of a Guerilla Science residency, we set out to perform science and art via an archeological excavation for material evidence of UFO activity in Oregon. The goal was to employ a scientifically compliant methodology for collecting and documenting data (archeology) in order to produce evidence that could be applied in assessing a scientifically noncompliant (non-falsifiable) phenomenon (UFO activity). The dissonance of this engagement was our attempt at art.

Archeology incorporates a wide breadth of evidence—soil color, isotopes, faunal remains, etc. As detailed below, we opened a 48 m² trench and conducted a traditional excavation with the expressed research agenda of looking for anomalous features—soil, geologic, or botanical contexts that did not have established explanations from the earth or biological sciences. We labored (with accordant perspiration) at these archeological and artistic elements of our project for five hours a day throughout the week of the festival. Attendees were encouraged to participate in the excavation—sieving, troweling, or documenting with minor guidance from our archeologist.

In the lead up to the event, however, upon learning more about the funding, motivations, and purview of Guerilla Science, the idea of using this opportunity to critically examine the SciCom field (and neoliberal knowledge production broadly) became increasingly intriguing. This process began with simple incredulity at the idea of receiving \$4,500 from the NSF to fly to the middle of Oregon and “dig for UFOs” (this award covered airfare, lodging, rental car, food, and archeological supplies). In the midst of several proposed budget cuts to federally funded research programs, most visibly related to climate science, we were being awarded a small sum to conduct an arguably frivolous excavation. Why?

In considering a somewhat meta critique of the funders of our project, a few ethical and practical concerns immediately arise. Could we, in good faith, execute a critical study of a group of which we were a part and by which our very presence was being financed? Thinking of Strathern's formulation of auto-anthropology as “anthropology in the social context which produced it” (1987, p. 17), we concluded that simply observing

patterns of behavior and sentiments expressed by our fellow Guerilla Scientists and festival attendees did not pose an ethical conflict. It would not “involve the manipulation of informants to elicit certain behavior” (Marshall, 1992, p. 2). Our observations primarily consisted of casual conversations with our colleagues and festival-goers, offering a somewhat paraphrased ethnography.

Evidence and Interpretation

A pre-Socratic epistemological tradition that spans the physical and social sciences suggests two broad categories of evidence: (1) *discursive*—all conceptual, linguistic, and cognitive information (the advice of a friend, an article in a magazine, social mores, or a hunch), and (2) *material*—all sensible, observable, and tactile information (a rock, a sword, a proton, a radio wave). Economically dominant methods of knowledge production since industrialization (or capitalization) have privileged material evidence as a more accurate representation of reality than discursive evidence. For example, temperature is determined by the expansion and contraction of mercury in a glass cylinder, not the memory of a summer day.

Recently, this epistemological division between material and discursive evidence has been questioned across the patchwork of scholarship loosely labeled new materialism (Barad, 2012; Braidotti, 2002; Morton, 2013). Barad has argued that every bit of discursive information exists materially—even if it is just the interaction of wind on the hairs in an ear, the paper in a book, or the electricity of a synapse in a brain. Equally, every bit of material information sends and receives signals (is discursive). This is not meant metaphorically. A drop of water hitting the surface of a rock responds differently to the materiality of the rock than the materiality of grass. And what else is interpretation but a discernment of difference that motivates subsequent behaviors? Under this framework, material and discursive evidence should not be considered categorically independent, but rather as inextricably bound in a kind of respiratory process.

Harrison (2015) suggests that the drive to isolate and elevate material evidence was motivated by a desire to construct a type of science un beholden to moral virtue. Prior to the 17th century, *scientia* simply referred to skills for solving problems. Such problems could be ethical and such skills could be rhetorical. Poovey (1998) affirms this pointed omission of ethical concern in the development of modern science, showing that early advocates of quantitative science championed it as disinterested, unbiased, and amoral. Contemporaneous critics of this emerging science, notably the Romantic poets, pointed out that it “could be made to serve any agenda, no matter how heartless or amoral” (p. 294). The work of

Haraway (1991), Latour (1993), and many others has amply demonstrated that the disinterested knowledge promised by early advocates of scientific methodology was a fantasy—“Epistemology and politics, as we now understand very well, are one and the same thing” (Latour, 2004, p. 28). Ethics were sacrificed for an illusory objectivity.

“The fallibility of human reason” (Harrison, 2015, p. 88) was another justification for an Enlightenment dismissal of discursive evidence. Fallible, in this context, is used as a synonym for unpredictable. Indeed, it has been stressed that material information became privileged evidence because it behaves in a more predictable manner (Daston and Galison, 2007). Discursive information is less predictable because it is derived from biological interactions, and biological entities engage in mistakes and aberrational behavior in order to reproduce themselves (evolution). Discursive information can be decent at prediction—nine out of ten people may describe similar experiences of a rock. However, only one out of 9×10^{27} photons will respond differentially to the rock. Odds favor materials. If probabilistic confidence and statistical certitude are the primary goals of knowledge production, then it is best to draw evidence from materials. Thus, discursive evidence is sometimes thought of dismissively as *merely* subjective. Ironically, the same derision was applied to statistics and probability prior to the 19th century (Hacking, 1975).

The privilege afforded predictability has directly impacted the trajectory of European knowledge production. As Malm (2016) points out, one of the determining factors in transitioning from hydropower to coal in 19th century industrializing Britain was its greater predictability (not its productivity). Subsequently, the predominant thermodynamic understanding of physics was derived from studies of the steam engine—an instrument of industrial (re)production. Physics’ conception of energy was developed directly alongside efforts to improve capitalist mass production (Stengers, 2010). In such cases, valid evidence is taken to be recurrent phenomena and behaviors. The exceptional, the unpredictable, or the indeterminate should not serve as evidence for guiding beliefs and truth claims.

The shape, then, of what may be called a capitalized epistemology is one that privileges indifference and quantifiable predictability—as William James had it science is “absolutely impersonal and indifferent to the moral lives of its exponents” (Harrison, 2015, p. 159). This contrasts with pre-19th century motivations of knowledge production, in which “Learning traditionally conceived, had not aimed at new discovery, but was rather a movement toward fulfillment” (p. 95).

By imbuing the predictability of material evidence with greater significance than occasionally aberrational discursive evidence, the scientific tradition abdicates the responsibility of human cultures for reality—the

sentiment being that humans cannot be trusted arbiters of reality because of our exceptional discursive spectrum (to deceive, to love, to be vengeful, to trust). Because of this handicap, stones and electrons are deemed more real than suffering or joy. Discursive evidence is not real because it is exceptional; it is not predictable with statistical certitude. This is the sub-text for notions of overcoming human fallibility.

Merry (2016) points out that quantitative sciences “may be used to avoid political discussion ... or to displace responsibility for decisions” (p. 21). This refusal to accept responsibility for the words we say, the actions we take, and the societies we create is what sanctions the derangement of environments and perpetuation of inequitable access to resources among capitalizing populations. The idea that humans are not responsible for reality hides the ethical abhorrence of systematically (politically decided) starving nearly a billion people (McMichael, 2015; Phillips, 2006); it calls into question the very reality of ethical behavior. To be clear, humans are not solely responsible for reality, but we are equally as implicated as electrons (Harman, 2010). Sadly, this inability to accept responsibility for reality is not a 21st century problem but is embedded in the dominant epistemology of the past 300 years, the same epistemology which has valorized science.

Knowledge production, scientific or otherwise, is always mediated both by socio-political motivations and the affordances of materials. Neither material nor discursive evidence need be weighted more heavily than the other when evaluating reality. This may sound alarming in an age of fake news. However, our aim is to illustrate that since discursive information is just as real as material (suffering is as real as coal), it should be evaluated and interpreted responsibly. Just as 20th century commenters worked to dismantle the nature-culture divide, 21st century scholarship is wrestling with the parallel material-discursive schism. Where substantial effort has been made to denaturalize discrimination and impoverishment, efforts to rematerialize justice and fear seem now equally salient.

Sexualized Triviality (Insight #1)

The NSF and much of popular culture mark a categorical distinction between the practices of science and art. Guerilla Science purports to consolidate this rupture, but the indictment herein is that the approach of such SciCom enterprises leads to the denigration of both practices. By repackaging science and art via marketing, Guerilla Science strips both science and art of their historic grounds for legitimacy and reifies the reality of marketing to its audiences. By examining how science and art are enfolded and compressed by Guerilla Science, this section illustrates how marketing has increasingly become the dominant vehicle for

knowledge production among capitalizing populations—marketing as consensus reality.

Guerilla Science plays on the perception that there are science/math people and artistic/creative people. Guerilla Science refutes this idea but acknowledges its presence. Their work aims to combat the sentiment that science and art adversarial or incongruent modes of thinking. Guerilla Science's stance is that if one is inclined toward the arts this does not preclude them from taking an interest in science. Notably, the equally pervasive cultural distinction between science and spirituality is implicitly rigidified in Guerilla Science's programming—there is room for art and science to play together, but not apparently science and religion.

As Guerilla Science affirms, science can be an outlet for great creativity and art may consist of the meticulous rigor often associated with laboratory science. The practices differ primarily in what attributes of knowledge they value. As detailed above, science values knowledge for its predictive capacities. Science draws evidence from normative conditions. Art often values the singular and exceptional. Knowledge can be all this—patterned and aberrant. The evidence that is activated to create works of art and their claims about the world often derives from feelings, impressions, or moods. It is not the skills that divide these practices, but the evidence valued.

This schism between science and art (and spirituality) is relatively recent in the EuroWest. These categorical divides were alien to Brunelleschi, Da Vinci, and Newton. Concurrent with industrialization, science has increasingly become the arbiter of quotidian reality. This was not the case five-hundred years ago. In his widely circulated 1435 treatise, Alberti described the burgeoning wave of linear perspective artists as the premier measurers of reality. Art, however, increasingly became associated with efforts to blur, question, subvert, and nuance taken-for-granted perceptions—to challenge the normative conditions upon which science's reality is based. This has led to the perception of an antagonism between the two practices.

While this bifurcation certainly demands questioning, historicizing, and perhaps reconciling, current efforts within the SciCom community to meld science and art fall short of this ambition. Neither science nor art are being produced or communicated, but rather marketing. At the eclipse festival, Guerilla Science was promoting science as “fun, creative, and sexy” to a population that identifies as fun, creative, and sexy. While defining art is beyond this article's capacity, the work on display at the Guerilla Science tent bore little resemblance to the either the high art produced in the world's cultural institutions or the more esthetically overflowing art appearing around the festival in the form of colorful installations and hypnotic soundscapes. Equally, while the science offered by

Guerilla Science may have better reflected institutional research than the astrological discussions occurring elsewhere, it was more of the demonstrative variety popular in Europe in the 18th century used to baffle and astound (Castle, 1995; Voskuhl, 2015). That is, causal observations of biological reproduction, ocular mechanics, and psychological tendencies were paraded around as sexualized trivia.

The word sex is used quite specifically. As good PR firms have been doing since Bernays (1955), the Guerilla Science team played heavily upon the libidinal urges of young people. Many of the group's contributions centered on topics such as the sensuality of dating, the psychology of attraction, or the reproductive behaviors of non-human animals. Science is sexy! The intonation of the tent's MC resembled a TV pitch man trying to promote the edginess of Mountain Dew or Pepsi. While this may have been savvy advertising, it also laid down a thick coat of underlying heteronormativity to an audience displaying non-normative expressions of sexuality openly and frequently. That is, there was an attempted normalization of the "straight time" of capitalized life which persistently looks ahead to the next event, be it graduation, marriage, child birth, retirement, or death (Edelman, 2007; Halberstam, 2005).

In a recurring event called "Sensual Speed Dating" participants were blind-folded and led on guided explorations of the tactile, auditory, olfactory, and gustatory attributes of rotating partners while recitations of pop-science regarding attraction were intoned. The format of this event mimicked a TV dating show. Such a learning format demands an oversimplification of the scientific content itself, in which species-specific concepts such as pheromones are universalized as laws of nature on the level of entropy. More pressingly though, this commercialized presentation of knowledge defers any scientific content being communicated to the larger reality of the game show—a rhetorical form explicitly developed to market (sell) commodities. Just as the evidence for thermodynamics came from 19th century studies of the steam engine, the evidence for romantic attraction here comes from the marketing teams that developed an entertainment format around which to sell hair care products.

Historically, marketing has been the antithesis of art and science. That is, the authority of art and science comes largely from *not being marketing*. As mentioned, the justification for science as an effective form of knowledge production had been its disinterestedness; its resistance to the persuasiveness of rhetoric. Conversely, art as a distinct practice over the past 300 years has been most eloquently sanctified as the manipulation of discursive or rhetorical concepts to reveal subsurface signals; to unleash affordances obstructed by socio-political normalization and sloganeering. Of course, as Joselit (2000) points out, with the postmodern slide toward

the flattening of optical and psychological depth, these ideals have come unhinged.

Today there is no shortage of references to the art of marketing or the science of persuasion. Certainly, art and science can be very persuasive, but this is precisely because they became legitimized as beyond (commercial) interest. If the work of the SciCom industry is illustrative, science and art are now reduced to communicating through the ontology of marketing—a field which avowedly dissembles and obfuscates. If a product of science or art cannot be effectively marketed, its reality is delegitimized. Perversely, the language of marketing, as it is explicitly designed to appeal to everyone (and most saliently the common person), presents itself as more democratic than the seemingly elitist or establishment knowledge of high science and high art. This is the precise strategic tack employed by corporate-funded campaigns to deny anthropogenic climate change.

It was not art that Guerilla Science residents were instructed to employ to draw onlookers to their exhibits. It was clickbait—those scintillating headlines that trail into an ellipsis deployed by online news outlets to hook audiences. While Guerilla Science’s enfolding of art and science into an ontology of marketing is fairly transparent, it evinces the larger claim that capitalizing populations rely on marketing as the dominant mode of communicating and producing knowledge. Even academic journals seek to maximize “eyeballs” by insisting that articles include searchable language. While this insight may seem banal (few would deny marketing’s increasing influence over public opinion and beliefs), the claim here is more tenacious: what we know or think we know about the world derives from an ontology of marketing, in which everything is exchangeable with an abstract value and desires are engineered to encourage fulfillment through consumption.

Beyond the ostensibly educational work of Guerilla Science, the SciCom field includes academic journals, NGOs, and most notably, high-end PR firms. The patter of these companies’ websites invariably includes language about storytelling—turning scientific research into a compelling narrative. Spectrum Science, for instance, is a “full-service strategic health and science communications agency that believes in the power of scientific storytelling to clarify complexity, capture imaginations, shift mindsets and move markets.” Most of these companies work on behalf of biopharma and biotech companies, translating breakthroughs in the commercialization of health into public reality. In this capacity, SciCom increasingly resembles promotional paradigms such as experience design (UX) and immersion marketing, wherein the goal is to seamlessly weave advertising into the condition of being alive.

Uncontrollable Knowledge (Insight #2)

Funding for the Guerilla Science residency was procured through the NSF's Advancing Informal STEM Learning (AISL) program as part of a \$938,029.00 grant for exploring how “people with low to no affinity for science, technology, engineering and math (STEM) can be introduced to STEM ideas in ways that are appropriate for their cultural identity and designed to achieve reasonable outcomes that allow for continued STEM engagement” (NSF, 2016). The aim of this section is to show that such grants and much of STEM promotion, despite the benign intentions of many of the actors involved, are not designed to make a more informed public, but rather a more profitable public.

The NSF's AISL program is part of a nationwide initiative to prioritize STEM education that is reflected in the content of standardized testing, grants, scholarships, and specially designed faculty positions in higher education. The Department of Defense also spends millions of dollars per year promoting STEM education (Lim et al., 2013). There is much literature on this initiative, assessing its effectiveness and impacts (Colatrella, 2014; Mathieu et al., 2009). Criticisms of STEM center on the initiative's devaluation of knowledge from the humanities, which, it is argued, engenders more reflective and less programmatic thinking skills. Efforts to amend this perceived lapse are evident in the recent promotion of STEAM (science, technology, engineering, *art*, and math) (Wynn & Harris, 2012).

According to Guerilla Science's NSF grant, attendees of events like the Oregon Eclipse Festival represent a subsection of the general population particularly uninterested in science. Such festivals, they write, are “cultural events that attract audiences who do not identify themselves as interested in science or broader concepts associated with STEM” (NSF, 2016). Such claims are directly contradicted by the convergence of arts festivals with the tech industry (Turner, 2009). If one looks past this contradiction, the NSF's motivation in setting aside \$938,029 for promoting STEM at arts festivals seems rather straightforward and astute—a highly targeted promotional campaign for scientific knowledge. At the Oregon Eclipse Festival were 30,000 people that may not subscribe to normative forms of knowledge; 30,000 people who may base their reality more on astrology than meteorology.

Such attempts at STEM propaganda by the NSF eerily echo the CIA's Cold War efforts to promote the idea that the U.S. values freedom of expression. In establishing and funding the Congress for Cultural Freedom in over thirty-five countries, the CIA worked to promote creative works such as the abstract expressionism of Jackson Pollock (Wilford, 2009). Less covertly, the U.S. State Department funded tours

abroad of Louis Armstrong, Duke Ellington, and Dizzy Gillespie as parts of its Jazz Ambassadors program, and has recently tried various efforts at “hip-hop diplomacy” in Islamic-majority countries (Aidi, 2011).

In conversing with festival-goers the purported disinterest in science seemed absent. We did not encounter anyone who denied anthropogenic climate degradation. Indeed, many expressed concern about the effect of atmospheric CO₂ on the planet’s temperature. There were also many notable feats of tech-savvy engineering in the construction of electronic light displays. Does this not signal a level of STEM appreciation greater than many other subcultures in the U.S.? There were certainly espousals of UFO theories, the causal influence of Jupiter’s moons, and discussions of deeper consciousness abetted by psychotropic chemicals. While such beliefs might be considered unrigorous by STEM advocates, they speak to a vivid scientific interest—UFOs are nothing if not a fetishization of technoscience, tracking the orbits of Jupiter’s moons requires an acknowledgement of celestial mechanics, and LSD is a powerful experiment in neurochemistry. If indeed the goal is to introduce STEM ideas to people with low to no affinity for science, the NSF may be targeting the wrong audience.

Rather than a disinterest in scientific knowledge, the audience of this particular festival seemed to display a thirst for answers outside the dominant regimes of knowledge production used to reproduce a society which leaves them empty, alienated, and unequal. Perhaps then, it is not the goal of these STEM advocacy efforts to encourage scientific interest, but to normalize predictive knowledge. Large lectures at the festival discussed topics such as: “spiritual practice and collective responsibility in a post-Trump world,” “body-wisdom and energetics,” “activating inner goodness and creating body-peace through spiritual self-care,” “sacred geometry,” and “dream hacking.” One lecture declared, “We live in a dramatic age with high stakes for the planetary future. To help us navigate this threshold of transformation, we need every available source of relevant insight.”

These interests do not foremost announce an anti-science bent so much as an anti-status-quo bent. There is more concern with rearranging the social order than the epistemological order. If the NSF’s AISL program were genuinely about cultivating public science literacy, one wonders why there are not comparable efforts by the NSF to penetrate Christian fundamentalist groups or sponsor climate change PSAs. Why does the NSF choose to spend promotional money convincing ravers that science is cool, as opposed to convincing creationists that the planet is 4.5 billion years old? I would suggest the answer lies less in these communities’ relationship to science than their relationship to power. Evangelical Christianity actively promotes adherence to the status-quo

power relations that have organized colonizing populations over the last five centuries (Tanner, 2019).

The pervasive tone of spirituality at the festival represented a wide variety of belief systems. The practitioners of these systems were engaged in an earnest process of thinking rigorously about how to develop more equitable and sustainable ways of living than is possible under the current global knowledge and economic regime. That is, they were trying to develop ways of living that did not require a belief in the perpetually accelerating asymmetrical growth of wealth, which is quite different from denying science.

Having satisfactorily marginalized the planet's existing cosmologies that diverged from the teleology of capitalism, excess wealth (specifically the NSF's \$938,029) is being directed toward snuffing out burgeoning efforts to socially organize outside of neoliberal configurations of power and resources. The primary objective of the NSF here appears to be to nudge U.S. citizens away from heterodox belief systems toward the more profitable rewards of science-based knowledge. It appears the NSF's targeting is more directed at people operating outside of the normative economy than outside science.

Festival participants (in the NSF's view) subscribe to uncontrollable knowledge. The knowledge curated and cultivated at such festivals is markedly less predictable than the knowledge produced and disseminated under the banner of institutional science. Uncontrollable knowledge has always been dangerous. Empowered groups often make efforts to force the disempowered to operate within a common set of beliefs. The Christianization that accompanied colonialism is a common example of making subjugated peoples more predictable by corralling them into the same reality as the colonizers. Economically, if everyone operates within the same epistemology their consumption patterns can be exploited more predictably.

Does the NSF want the U.S. population to be smarter? Maybe, though it does not take much imagination to conceive of other uses of public money that might achieve this goal more effectively (training and hiring more teachers). Does the NSF want to make the U.S. population more predictable and profitable? Probably. STEM innovations are huge drivers of economic growth, as they are primarily responsible for making and improving commodities. The largest sectors of the global economy (finance, automotive, tech, insurance, pharmaceutical) are all premised on faithful adherence to the predictive reality of science.

It is from the pharmaceutical industry that Guerilla Science draws support for its larger operations, specifically the Wellcome Trust, the wealthiest charitable organization in the U.K. Their £20 billion endowment (second only to the Bill & Melinda Gates Foundation worldwide) funds

grants for biomedical research. Rather than turning to homeopathic herbal solutions, the audience at the Eclipse Festival should perhaps be buying more Wellcome-approved pharmaceuticals? The Wellcome *charity* profited £425.3 million in FY 2017 (Wellcome Trust, 2017).

The NSF presence at the 2017 Oregon Eclipse Festival was not consensual, as evidenced by the effort to cloak their involvement in the event through Guerilla Science—hiding behind the eccentric fonts and colorful wardrobes of SciCom. Guerilla Science’s grant reads, “The research will ... test the degree to which encounters with [Guerilla Science’s] learning experiences create a higher probability to actively seek subsequent science experiences. Project deliverables include a how-to guide for professionals on expanding STEM audiences ...” (NSF, 2016). While there is no direct indictment of the NSF’s motives here, the language (“deliverables”) appears much less about education than about neoliberalizing scientific knowledge.

On several occasions during our excavation, we were thanked by festival-goers for doing the “good work” of attempting to find evidence of UFO activity. The subtext of this gratitude was that we were defying the institutional disregard or coverup of UFO phenomena. Had they known we were being funded by the NSF as part of an insurgent propaganda group attempting to dissuade them from the astrology, neo-mysticism, and the other bits of esoterica being practiced elsewhere at the festival, one suspects they may not have been so thankful.

At one point Guerilla Science’s presence was strongly rebuked. As the moment of totality was nearing, a team of witty astronomers was making comical pronouncements over the tent’s speakers, such as (paraphrasing), “*Do not be alarmed when the sun disappears, we assure you it will return ... You didn’t do anything wrong, please don’t sacrifice any chickens ...*” Such pronouncements were meant to entice festival-goers to stop by and peak through their special telescopes for an enhanced look at the eclipse. As totality grew closer, a festival-goer came over in anger and unplugged Guerilla Science’s speakers. This angered attendee had come from a larger tent where many were engaging in a silence prior to the total eclipse. No matter how cynical one may be, it is easy to appreciate the frustration this festival-goer felt. Guerilla Science were like obnoxious tourists walking into a sacred site and carrying on amongst ardent pilgrims that had come from miles away to experience the spirituality of the setting.

Conspiracy and Confusion (Insight #3)

Underlying many narratives about UFO activity is a conspiracy. The conspiring is usually attributed to world governments or deep state intelligence operatives. Governments may be conspiring to cover-up the

existence of extraterrestrials, cover-up our species' own cutting edge technologies, or to propagate UFO enthusiasm as some manner of distraction tactic. This section argues that far from demonstrating a lack of adherence to scientific methods, such theories evince a devout faith in technoscience as society's preeminent explanatory tool.

It has been noted that a sharp rise in UFO sightings correlates with the detonation of atomic weaponry in New Mexico in 1945 (Cantor, 2010). This correlation has been addressed in science fiction and socio-cultural analysis (Denzler, 2001; Lepselter, 2016). Among social scientists, atomic activity is often used to dismiss the actual existence of UFOs. Moynihan discusses the role that alien civilizations have played as a salve in pondering the post-bomb end of our own civilization (2019). Others have interpreted UFOs as social fabrications induced by the jaw-dropping new capacity humans demonstrated for harnessing energy in the 20th century. This line of thought implies that atomic power opened up a new theater of imaginaries, suggesting that while people have always seen things that did not fit into their understanding of the world, only after 1945 did they begin to attribute them to beings capable of manipulating time, space, and energy in a techno-machinic fashion. Perhaps, the argument goes, earlier UFOs were interpreted divinely.

Among believers in the actual presence of UFOs, many narratives attribute them to the advanced classified technologies of governments. The thinking is that if the military can develop city-incinerating bombs, they may well be capable of making machines that defy prevailing understandings of aeronautics. Some have suggested that the irreality of atomic warfare moved us into a virtual world where only the shadows of rationality persist (Baudrillard, 1994). Popular BBC documentarian Adam Curtis suggests this is no accident, but rather a manner of control through disorientation (2016). Curtis argues that reality has become so obfuscated that there can be no effective resistance to existing power structures. Ironically, Curtis' attempt at indicting the purposeful dissemination of conspiracy culture comes off as a conspiracy theory in itself—the *powers-that-be* are ominously controlling the global population by spreading rumors.

This popularity of conspiracy, along with politically motivated accusations of fake news, evinces a contemporary crisis of evidence. While there is no shortage of evidence, there is diminishing evidence which may consensually be used as a basis for knowledge production. Much of the population simply does not believe mass-produced information (either because they do not trust governments or they do not trust corporations). Closely aligned with this lack of trust is the clinical diagnosis of paranoia. Symptoms include inflated sense of self-importance, being overly sensitive to criticism, believing that others wish you harm, and reflexive outrage.

Many of these paranoid qualities have been noted as present in violent fundamentalist religious groups (Emerson & Hartman, 2006), but also permeate secular modes of socialization such as Facebook and Reddit (Johnson, 2018).

The epistemological practice of casting shade upon reality rides a curious Mobius strip from Enlightenment skepticism to today's Red Pill communities (misogynist groups who claim to see past a feminist conspiracy to suppress men) (Ging, 2019). Ewa Plonowska Ziarek (1996) traces this skeptical tradition from Kant to its collision with Derrida's deconstruction. The skeptical perspective casts doubt on humanity's ability to know anything for certain, not a particularly groundbreaking idea, but followed to its conclusions results in a postmodern nihilism. Skepticism and rationalism are both underwritten by the idea that human subjectivity is unreliable—that perception cannot be trusted. Skepticism in its Enlightenment guise relies on deterministic rationality to refute suspect truth claims. However, as scientific consensus revealed the universe to be non-deterministic (Bohr, 2010; Fuchs, 2010), rather than acknowledging that some aspects of reality could exist outside of rationality (that alterity could share in reality), skeptics (both scientists and postmodern artists) chose to tear down all of reality like a spoiled kid that says *if I can't have reality, no one can!*

Ziarek contrasts the skeptical disavowal of the possibility of knowledge with a responsibility toward the outside of rationality:

Skepticism ... concerns itself only with the possibility or impossibility of knowledge and not with an ethical response to alterity. To treat alterity as merely an obstacle to knowledge is still to avoid the encounter with the other ... the relation to the other reveals the inescapable limits of the subject. Yet, because this figuration of alterity is so entirely negative, subjects search for the means of escaping from this "unfortunate" predicament, the miraculous cure absolving them from the obligation of a response. (1996, p. 94)

The turn toward conspiratorial thinking appears to be such an escape—a miraculous cure absolving us from obligation to each other as social beings, absolving us from the responsibility of acknowledging the reality that is outside ourselves. In this sense, conspiracy may be considered irresponsible.

Any system of knowledge production is bound to have gaps. What distinguishes the EuroWestern rational epistemological tradition is that the gaps in its knowledge are seen as imperfections and threats to the dominance of the prevailing social order. If reason and rationality cannot explain a phenomenon, its reality is threatening and thus threatened. As rationality's gaps have grown bigger, conspiracy has snuck in to fill these voids. However, a void is not intrinsically an imperfection; it is a signal

that some bits of reality are exterior to your society of knowledge makers. “Policy makers (and most scientists) believe that a lack of definitive evidence necessarily marks an uncertainty, a gap in the current state of knowledge that will eventually be filled” (Barad, 2012, p. 37).

The adherence to conspiracy theories is facilitated by the scientifically abetted idea that *everything* is knowable. Lacunae in knowledge or simple uncertainties are seen as failed or unfulfilled science that must be filled. Masco (2012) writes of post-bomb Euro-Americans that they live in a world, “in which superstition is set against the possibility of an unending technological progress” (p. 1115). This thinking suggests that if (under science) everything is knowable, and there is something we do not know, a conspiracy must be afoot.

In this vein, festival attendees who spoke to us about their experiences of UFO phenomena invariably framed these accounts around the idea of the *unexplainable*. Here, there seems to be something implicit: *unexplainable ... in terms of what is commonly known about science*. Rapid erratic movements of light or shapes in the sky do not conform well to today’s techno-scientific capacities. However, these accounts are, strictly speaking, not unexplainable, as interlocutors did indeed offer several explanations of the phenomena. These explanations often centered on non-human or secret government technology, but they were *explanations*. This effort of explanation-building for obscure occurrences is a large part of social bond-building. Explanations themselves are always socio-political. Whoever’s explanation of events is trusted, accepted, and normalized wields great power. The social negotiation of explanation, in this case, is unfortunately largely mediated by TV programs like the archeology professor’s *bête noire*, *Ancient Aliens*.

Regardless of the narrative, the correlation between atomic weaponry and UFO sightings suggests that, far from a disbelief in science, the reality of science is so taken-for-granted that the idea of experiences falling outside its explanatory capacities demands a coverup or a conspiracy. UFO theories are very much the product of a population that has been normalized to be impressed by the exploitation of energy around which modern science distinguished itself. The promise of harnessing the energy necessary for an alien species to visit our planet is highly alluring. The copious television programs exploring alien exploits are marketing a speculative salvation from our thirst for energy—a way to exist as an advanced energy-using species without depleting our resources. Aliens are highly marketable to capitalizing populations because in almost all popular iterations they are portrayed as further along capitalism’s teleological trajectory of perpetually accelerating growth than ourselves.

The Planet Is a Magnet (Insight #4)

There is copious evidence of UFO activity in Oregon. This evidence usually takes the form of first or secondhand accounts, amateur documentation, or poorly designed websites. Based in Seattle, the National UFO Reporting Center (NUFORC) has documented 114,750 sightings since its inception in 1974. Since their recording began, the state of Oregon has registered the most UFO sightings in the U.S., per capita. Additionally, the term “flying saucer” is allegedly derived from a pilot that witnessed unusual aviation activity over Oregon airspace, and a 1950 photograph of a peculiar airborne object taken in McMinnville, OR is often cited as the first UFO photo.

Through producing material evidence such as topographic landscape surveys, excavated artifacts, and soil samples, our aim was to complement this abundant discursive evidence of UFO activity. The point was not to refute or confirm UFO narratives in Oregon, but to supplement them with evidence gleaned through different forms of observation, specifically those that emphasize the predictability and reproducibility of interactions (the scientific method). Evidence is not discovered. It is created through the socially mediated design of our observations (Merry, 2016). Negotiating an interpretation of this evidence is the work of human culture.

Despite our excavation being more performance art than research, there is archeological work addressing similar themes. Gorman’s archeology of outer-space (2005), White’s archeology of Burning Man (2013), and various efforts at punk archeology (Richardson, 2017) tackle similar subjects in the sub-discipline of contemporary archeology. Our efforts may most closely resemble González-Ruibal’s archeology of supermodernity (2008) and destruction (2018), in that we sought evidence of large-scale rapid energy events without precedent. Just as supermodern activities like uranium mining are creating anomalous socioenvironmental configurations (Hecht, 2014), we sought evidence of anomalous features in anything from the geology, the hydrology, the depositional stratigraphy, and the floral and entomological samples. We were looking for signals that might indicate patterns of energy distribution that are not common in the geo-history of Earth or industrialized society. Having no presumptions of what the artifacts of UFO pilots or UFO parts might look like, we considered that looking for specific traces of such evidence would be futile. Framing UFO phenomena in terms of aberrational energy events proved useful for skirting the topics of non-human technology, government experimentation, or other conspiratorial lines of thought.

Archeology draws the evidence for its knowledge claims from materials (Lucas, 2004). Archeology casts a wide net for evidence precisely because

what it studies is inherently absent. It seeks to understand the discursive reality of populations based solely on the traces they leave on the material world. Fowles writes that the archeologist's "goal must be to draw the immaterial into the field of encounter" (2010, p. 29). As such, archeology's aims pose a serious challenge to the material-discursive divide. Implicitly, archeologists behave as though all materials are conduits of meaning—all materials are signs. Archeologists look for politics in rock formations, for gender in copper fragments.

For our excavation, we relied on the data from NUFORC and the constraints of the festival grounds. Since NUFORC began monitoring UFO sightings 2,641 have occurred in Oregon. Normalizing population to sighting density and assuming (A) that each sighting represents a unique craft, and (B) that UFOs are equally capable of traversing time and space, we can extrapolate the following figures: the 8 km² covered by the festival should have seen 7.5 million UFOs since the Earth was formed (4.55 billion years ago); 4,000 since the Pleistocene (2.5 million years ago); and 18 since the Holocene (11,000 years ago) (Figure 1). Of these potential occurrences, the likelihood that material evidence may be recovered seems dubious. However, just as the atmospheric and geological impact of humanity's atomic detonations will be visible for millennia, the traces of advanced energy use by extraterrestrials may be extremely long-lasting.

Based on the calculations provided above regarding the size of Oregon and distribution of sightings reported to NUFORC, the 48 m² plot we mapped out was as statistically likely to yield evidence of UFO activity as any other within the 8 km² of the festival. Our area exhibited a slightly higher elevation than the surrounding terrain (~10 cm). This topographic incidence was most likely due to the pattern of foot traffic, construction, and deposition that occurred leading up to the festival.

Bucking traditional excavation methods that rely on right angles to configure excavation space, our trenches were composed of parallelograms with 45° and 135° angles (see site map) (Figure 2). This figuration was undertaken with the presumption that material deposition of advanced energy events would not conform to perpendicular distributions. This methodological decision was also intended to offer the esthetic appearance of layered dimensionality. The non-orthogonal trench outlay did make planning contexts less expedient, as it took a few more seconds to think outside of a square grid.

The rough Oregon desert terrain proved difficult excavating for our limited team and limited time. Ambitiously, we hoped to reach staggered depths of 1 m, 0.5 m, and 0.25 m. In only one of our trenches were we able to excavate and record to 30 cm. The entire 48 m² was not excavated, rather the area was partitioned into three equal 16 m² trenches. Within Trench One, 4 m² were excavated; within Trench Two, 8 m²;

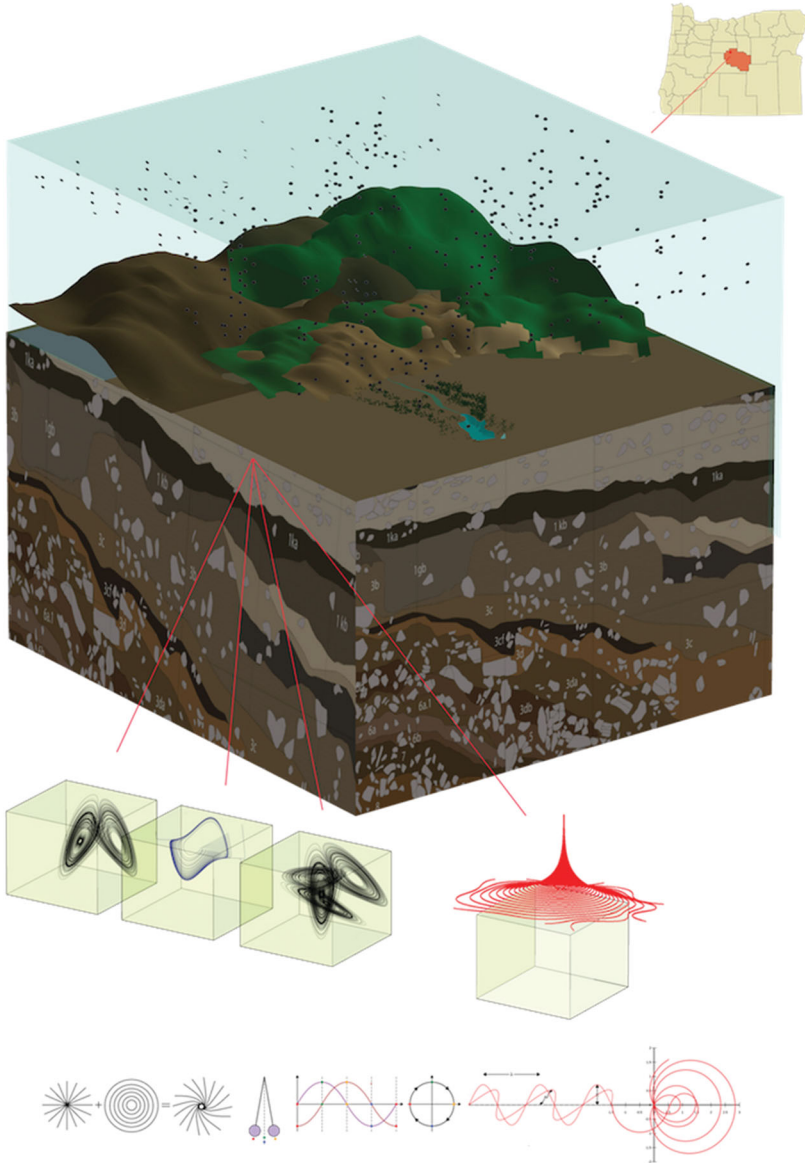


Figure 1. Artistic rendering of hypothetical distribution of UFOs over Oregon since the Pleistocene.

within Trench Three, all 16 m². A 1/4” sieve was employed on the backfill from Trench Two.

Within each trench there was some variability of the soil and petrological composition, with thick and expansive stretches of iron panning that could be traced throughout our area. Iron panning is the process of iron oxide accumulation in soils that creates a cement-like surface—

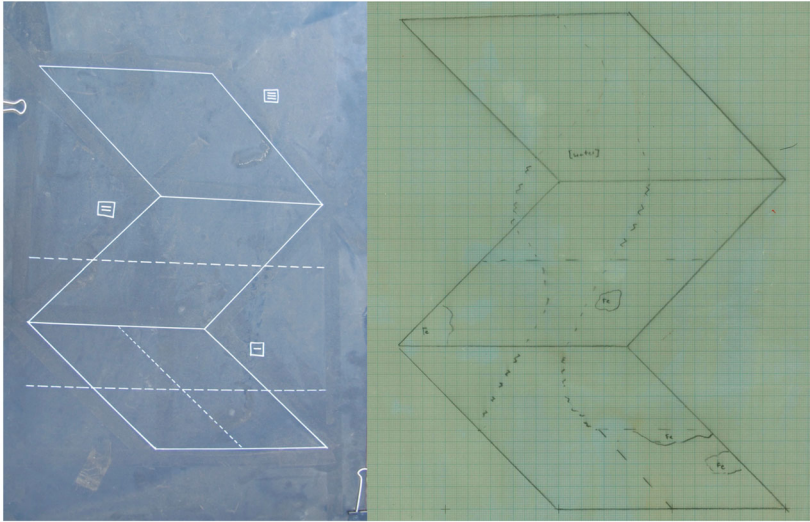


Figure 2. Plans of parallelogram trenches. The parallelogram layout gives the illusion of folded dimensionality on the 2-D surface.

challenging to dig through or around. Trench One (our deepest trench) included multiple contexts and features. There were inclusions of floral material both alive and dead. There was no evidence of fire or combustive activity. There appears to have been some hydrological activity slightly below the surface, as discerned by the ridge of iron panning running South to North and the distribution of flora. The single-layer Harris Matrix system was employed for recording contexts.

Small finds consisted primarily of common industrially produced materials, including various plastic and glass bits, as well as discernable shoe and beverage container parts and one pair of swimming trunks (Figure 3). We also made the decision to include a variety of lithics in our finds collecting. The lithics we counted as artifacts were highly rusted or metallic fragments found clustered in large deposits, as well as some of the particularly stylized agate and quartz crystals that were abundant throughout the festival grounds. Such lithic material was not initially proposed for collection and documentation, as it occurs without the directed energy manipulations of humans or extraterrestrials, but upon discussions with festival-goers, it was determined that such geological finds were of great interest, and fit into various narratives of UFO activity we encountered. Our decision to include such lithics, after initial dismissal, reflects the growing movement within archeology to consult traditional ecological knowledge, oral histories, and multiple stakeholders as to what constitutes evidence, countering the normative preconceptions of specialist archeologists (Atalay, 2006).



Figure 3. Small finds from site—aluminum from a can and rubber from a shoe.

The iron-rich earth of the excavation area provided many opportunities to discuss the process of interpreting evidence. With a set of small magnets, we demonstrated the magnetism of the rocks (moving a rock over a magnet picked it up). This presented the exact kind of teachable moment STEM advocates might relish. That is, we could discuss that the entire planet is magnetic or compelling tidbits about electromagnetism preventing us from walking through walls and preventing my atoms from ever actually touching your atoms. We could talk about water as a conductor of electricity and the process of rusting via oxidation.

We reviewed these facets of electromagnetism when engaged, but as stated in the proposal for this project, our aim was to produce as much evidence as possible, which would serve as the basis for a community-based interpretation—an exercise in community narrative building. As such, offering our pre-packaged interpretations of soil magnetism or iron oxidation seemed unfaithful to the aims of our project.

One UFO narrative that our material evidence could marginally support claims that common geological properties of the earth running from roughly Washington to New Mexico (curving along the California–Nevada border) are such that they serve as some manner of guidepost or corridor for the movement of high energy events such as UFOs. Indeed, Oregon’s geology has much in common with that of New Mexico. Much of the terrain is classified by the USGS as “intermediate and mafic volcanic rock, including basalt, welded ash particles, or crystals” (United States Geological Survey (USGS), 1998). Additionally, both Oregon and New Mexico include regions of geothermal activity. More broadly, maps of the most UFO sightings per capita nearly precisely match-up with the intermontane plateau, roughly situated between the Sierra Nevadas to the West and the Rockies to the East (Figure 4).

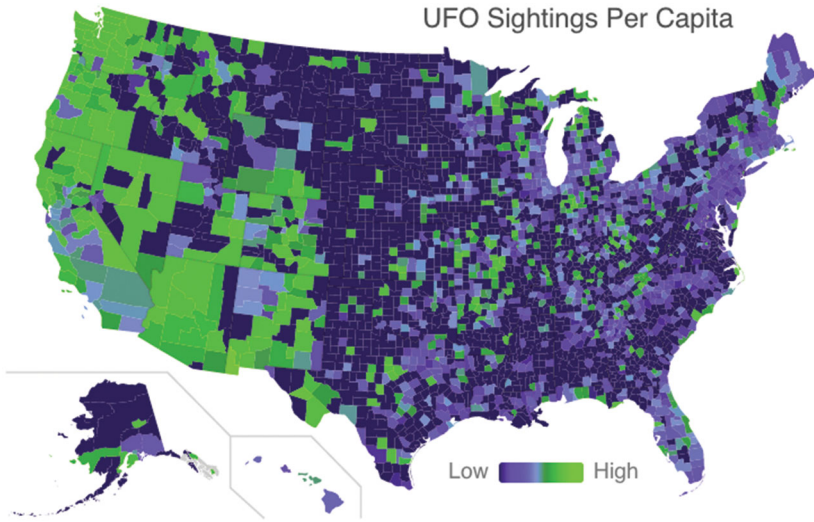


Figure 4. Map of UFO sightings per capita.

There have been many explanations offered for this correlation, from speculations about the Area 51 site, to the more well-documented Air Force activity in the region, and various theories surrounding atomic weapons testing. These explanations are often contrasted with social explanations regarding the attitudes and beliefs of populations that inhabit these Western states, e.g., streaks of libertarian distrust of authoritative knowledge and remnants of frontier-pushing settler culture.

As part of our residency, we gave a presentation on our project and findings at the Guerilla Science tent to the festival-goers. After presenting our evidence, we asked for a show of hands from those who believed the evidence might indicate UFO activity in Oregon. Of the approximately fifty audience members, only one said they did not believe in UFOs (another audience member was agnostic on the matter). We did not further inquire if the audience believed in aliens. This near-consensus suggests that the festival-goers were perhaps resistant to scientifically sanctioned knowledge, but not to the powers of science and the technological progress it (overtly or tacitly) promises. Highly magnetized rocks or clusters of agate seemed more plausibly explained as byproducts of intelligent techno-engineering than of regularly occurring geologic processes.

Closing Time

Given the above, it does not appear that the Oregon Eclipse Festival audience needs to be convinced that science is both an interesting and

trustworthy explanatory tool. Rather, if STEM advocates wish to diminish reliance on conspiracy or quash anti-vaccination sentiment, their money may be better spent on highlighting the differences between types of evidence and types of explanation. If the goal of the NSF is to engender greater public science literacy, perhaps the focus should be more on the literacy than the science—promoting education in rhetoric to assist the public in responsibly parsing the legitimacy and provenience of information. Instead, in this case, they contributed to the dissembling ontology of marketing by deceptively funding rhetorically corrosive public relations firms to make science seem fun, subtly reifying the dangerous idea that science can explain *everything*.

Anyone who gets in an airplane or uses a cellphone believes in the methods of science, implicitly. Climate change denial usually centers on political motivation, rarely questioning the competence of science. There is no significant deficit of trust in science; no need to March for Science (as has been done annually in the U.S. since 2017). A March for Responsibility, however, would be quite welcome.

ORCID

Scott W. Schwartz  <http://orcid.org/0000-0002-3837-9998>

References

- Aidi, H. (2011). The grand (hip-hop) chessboard: Race, rap and raison d'état. *Middle East Report*, 260, 25–39.
- Atalay, S. (2006). Indigenous archaeology as decolonizing practice. *The American Indian Quarterly*, 30(3), 280–310. <https://doi.org/10.1353/aiq.2006.0015>
- Barad, K. (2012). Nature's queer performativity. *Kvinder, Køn Og Forskning/Women, Gender and Research*, 1(2), 25–53.
- Baudrillard, J. (1994). *Simulacra and simulation*. University of Michigan Press.
- Bernays, E. (1955). *The engineering of consent*. University of Oklahoma Press.
- Binford, L., & Sabloff, J. (1982). Paradigms, systematics, and archaeology. *Journal of Anthropological Research*, 38(2), 137–153. <https://doi.org/10.1086/jar.38.2.3629594>
- Bohr, N. (2010). *Atomic physics and human knowledge*. Dover.
- Braidotti, R. (2002). *Metamorphoses: Towards a materialist theory of becoming*. Polity Press.
- Cantor, P. (2010). The truth is still out there: The X-files and 9/11. In K. Mulgrew (Ed.), *Homer Simpson marches on Washington* (pp. 75–96). University Press of Kentucky.
- Castle, T. (1995). *The female thermometer: Eighteenth-century culture and the invention of the uncanny*. Oxford University Press.
- Colatrella, C. (2014). Why STEM students need gender studies. *Academe*, 100(3), 26–30.
- Curtis, A. (2016). *HyperNormalisation*. British Broadcasting Company.

- Daston, L., & Galison, P. (2007). *Objectivity*. Zone Books.
- Denzler, B. (2001). *The lure of the edge: Scientific passions, religious beliefs, and the pursuit of UFOs*. University of California Press.
- Earle, T. K., Preucel, R. W., Brumfiel, E. M., Carr, C., Limp, W. F., Chippindale, C., Gilman, A., Hodder, I., Johnson, G. A., Keegan, W. F., Knapp, A. B., Potter, P. B., Rolland, N., Rowlett, R. M., Trigger, B. G., & Zeitlin, R. N. (1987). Processual archaeology and the radical critique. *Current Anthropology*, 28(4), 501–538. <https://doi.org/10.1086/203551>
- Edelman, L. (2007). *No future: Queer theory and the death drive*. Duke University Press.
- Emerson, M., & Hartman, D. (2006). The rise of religious fundamentalism. *Annual Review of Sociology*, 32(1), 127–144. <https://doi.org/10.1146/annurev.soc.32.061604.123141>
- Fabian, J. (1983). *Time and the other: How anthropology makes its object*. Columbia University Press.
- Fowles, S. (2010). People without things. In M. Bille, F. Hastrup & T. F. Sørensen (Eds.), *The anthropology of absence: Materialisations of transcendence and loss* (pp. 23–41). Springer.
- Fuchs, C. (2010). Quantum Bayesianism at the perimeter. *Physics in Canada*, 66(2), 77–82.
- Ging, D. (2019). Alphas, betas, and incels: Theorizing the masculinities of the manosphere. *Men and Masculinities*, 22(4), 638–657. <https://doi.org/10.1177/1097184X17706401>
- González-Ruibal, A. (2008). Time to destroy. An archaeology of supermodernity. *Current Anthropology*, 49(2), 247–279.
- González-Ruibal, A. (2018). Beyond the anthropocene: Defining the age of destruction. *Norwegian Archaeological Review*, 51(1–2), 10–21.
- Gorman, A. (2005). The cultural landscape of interplanetary space. *Journal of Social Archaeology*, 5(1), 85–107. <https://doi.org/10.1177/1469605305050148>
- Hacking, I. (1975). *The emergence of probability: A philosophical study of early ideas about probability, induction and statistical inference*. Cambridge University Press.
- Halberstam, J. (2005). *In a queer time and place: Transgender bodies, subcultural lives*. New York University Press.
- Haraway, D. (1991). *Simians, cyborgs, and women: The reinvention of nature*. Routledge.
- Harman, G. (2010). *Towards speculative realism: Essays and lectures*. Zero Books.
- Harrison, P. (2015). *The territories of science and religion*. University of Chicago Press.
- Hecht, G. (2014). *Being nuclear: Africans and the global uranium trade*. MIT Press.
- Johnson, J. (2018). The self-radicalization of white men: “Fake news” and the affective networking of paranoia. *Communication, Culture and Critique*, 11(1), 100–115. <https://doi.org/10.1093/ccc/tcx014>
- Joselit, D. (2000). Notes on surface: Toward a genealogy of flatness. *Art History*, 23(1), 19–34. <https://doi.org/10.1111/1467-8365.00193>
- Latour, B. (1993). *We have never been modern*. Harvard University Press.
- Latour, B. (2004). *Politics of nature: How to bring the sciences into democracy*. Harvard University Press.

- Lepselter, S. (2016). *The resonance of unseen things: Poetics, power, captivity, and UFOs in the American uncanny*. University of Michigan Press.
- Lim, N., Haddad, A., Butler, D., & Giglio, K. (2013). *First steps toward improving DoD STEM workforce diversity*. RAND Corporation.
- Lucas, G. (2004). Modern disturbances: On the ambiguities of archaeology. *Modernism/Modernity*, 11(1), 109–120. <https://doi.org/10.1353/mod.2004.0015>
- Malm, A. (2016). *Fossil capital: The rise of steam-power and the roots of global warming*. Verso.
- Marshall, P. (1992). Research ethics in applied anthropology. *IRB: Ethics and Human Research*, 14(6), 1–5. <https://doi.org/10.2307/3563851>
- Masco, J. (2012). The end of ends. *Anthropological Quarterly*, 85(4), 1107–1124. <https://doi.org/10.1353/anq.2012.0061>
- Mathieu, R., Pfund, C., & Gillian-Daniel, D. (2009). Leveraging the NSF broader-impacts criterion for change in STEM education. *Change: The Magazine of Higher Learning*, 41(3), 50–55. <https://doi.org/10.3200/CHNG.41.3.50-55>
- McMichael, P. (2015). *Food regimes and agrarian questions*. Practical Action Publishing.
- Merry, S. (2016). *The seductions of quantification: Measuring human rights, gender violence, and sex trafficking*. University of Chicago Press.
- Morton, T. (2013). *Hyperobjects: Philosophy and ecology after the end of the world*. University of Minnesota Press.
- Moynihan, T. (2019). The end of the world: A history of how a silent cosmos led humans to fear the worst. *The Conversation*. <https://theconversation.com/the-end-of-the-world-a-history-of-how-a-silent-cosmos-led-humans-to-fear-the-worst-120193>.
- National Science Foundation (NSF). (2016). *Research and development on understanding STEM identity using live cultural experiences*, #1612719. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1612719
- Phillips, L. (2006). Food and globalization. *Annual Review of Anthropology*, 35(1), 37–57. <https://doi.org/10.1146/annurev.anthro.35.081705.123214>
- Poovey, M. (1998). *A history of the modern fact: Problems of knowledge in the sciences of wealth and society*. University of Chicago Press.
- Richardson, L. (2017). I'll give you 'punk archaeology', sunshine. *World Archaeology*, 49(3), 306–317. <https://doi.org/10.1080/00438243.2017.1333036>
- Stengers, I. (2010). *Cosmopolitics* (vol. 1). University of Minnesota Press.
- Strathern, M. (1987). The limits of auto-anthropology. In A. Jackson (Ed.), *Anthropology at home* (pp. 59–67). Tavistock Publications.
- Tanner, K. (2019). *Christianity and the new spirit of capitalism*. Yale University Press.
- Turner, F. (2009). Burning Man at Google: a cultural infrastructure for new media production. *New Media & Society*, 11(1–2), 73–94. <https://doi.org/10.1177/1461444808099575>
- United States Geological Survey (USGS). (1998). Mine and mineral processing plant locations—supplemental information for USGS map I-2654 [By D. Kramer, J. Papp, N. LaTurno, & J. Gambogi]. USGS, USGS Map I-2654.
- Voskuhl, A. (2015). *Androids in the enlightenment: Mechanics, artisans, and cultures of the self*. University of Chicago Press.

- Wellcome Trust. (2017). *Annual report and financial statements 2017*. <https://wellcome.ac.uk/sites/default/files/wellcome-trust-annual-report-and-financial-statements-2017.pdf>.
- White, C. (2013). The Burning Man festival and the archaeology of ephemeral and temporary gatherings. In R. Harrison, P. Graves-Brown, & A. Piccini (Eds.), *Oxford handbook of contemporary archaeology* (pp. 591–605). Oxford University Press.
- Wilford, H. (2009). *The Mighty Wurlitzer: How the CIA played America*. Harvard University Press.
- Wynn, T., & Harris, J. (2012). Toward a STEM + arts curriculum: Creating the teacher team. *Art Education*, 65(5), 42–47. <https://doi.org/10.1080/00043125.2012.11519191>
- Ziarek, E. P. (1996). *The rhetoric of failure: Deconstruction of skepticism, reinvention of modernism*. State University of New York Press.