

# Chthonic Media: Archaeology, Energy and Resource-Becoming in Arkadia

## AUTHOR BIO

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## ABSTRACT

The idea of the past gestures at an individual or collective's knowledge of events which occurred before the present. Given this spacious conceptual fitting, the past can appear to be a vaguely theorized knowledge space. But, what *makes* the past? Is it existent only to be manipulated by culture? Or is it a resource which can be located? This essay seeks to explore what the past is in a world rendered in a new materialist spirit. New materialisms challenge scholars to discard the divide between socially construction and materiality. Through the concept of "resource materialities," a genealogy will be constructed which links Science Technology Studies, the subfield STS of the Underground, and media theory together. Based on experience participant observing an archeological dig in Arkadia, Greece, this essay will then proceed to take seriously that the past is *not* a limitless symbolic resource by investigating two underground resources from which the past *can* be derived: ancient ceramic fragments and lignite coal deposits. The resulting account of the *making* of ceramic fragments as a knowledge resource and lignite as an energy resource intends to provide a description of the choreography required to produce these resources. Ultimately, this account provides evidence in support of the concept of "resource materialities." In the critical space following, this paper will discuss problems with the relationality of resources and recommend action. Lastly, this essay concludes by exploring the consequences of this conceptualization of past making.

## KEYWORDS

resource, underground, archeology, energy, materiality, past-making

## Introduction

What is the past? At first, there appears to be a direct answer: the past is an individual or collective's knowledge of events which occurred before the present. Many may find this definition enough, but for others a more complex description is necessary. For example, in a volume on the archaeology of land ownership Despina Catapoti articulates the perspective that the past is a "virtual territory" where "the imaginary meets the real" (Relaki and Catapoti 160). Others have concluded that if the past is "virtual" in this way, a material site of construction and the stuff of that construction must be located and analyzed.

In *Science and Technology Studies* (henceforth, STS) Geoffrey C. Bowker carried out such an undertaking, developing the concept of the "mnemonic deep" from an infrastructural study of the memory practices and technical infrastructures that constitute the "eternal past" from which the scientific present is constructed. The "mnemonic deep" is the vast system of technical memory practices from which science derives a chronological positioning system for the assembly of natural scientific theory (Bowker, *Memory Practices* 1–34). Bowker's engagement stems from an inquiry into the geoscientific knowledge produced in service to the oil industry in the early twentieth century (Bowker "A Well Ordered Reality"). This work suggests that through the underground, knowledge, temporality and memory are entwined with resource extraction. In the spirit of Bowker's pursuit, I move this essay from the perspective of sociological infrastructures to an anthropological study of the production and politics of the resources from which traces of the past can be read into the "mnemonic deep." In order to perform this investigation, I seek to explore what the "past" is in a world rendered in this vibrant, new materialist manner, by engaging with the past as a knowledge space created from extracted underground resources.

## The Past as Resource, Social Construction and the New Materialisms

In 1981, anthropologist Arjun Appadurai argued that the past is a scarce symbolic resource, specifically arguing against the "tacit assumption that the past is a limitless and plastic symbolic resource, infinitely susceptible to the whims of contemporary interest and the distortions of contemporary ideology" (Appadurai 201). In his exploration of how debates about the past are organized, Appadurai finds "there appear to be a set of norms ... which govern the terms of the debate concerning the past" (217). This essay embraces Appadurai's framing of the past as a resource but with a new materialist rather than a social constructionist sensibility. While insightful, Appadurai's finding of classic "norms" behind the operation of debates about the past enables the perspective that things are empty vessels to be filled with power by social relations – a problem for a materialist analysis of the virtual space of the past. In the context of Appadurai's 1981 work, the past is purely social and its production hinges on the interaction and negotiation of symbolic value among important social categories in the hierarchy of authority.

Foucault, post-structuralist pioneer of inquiry into norms, attempted to intervene against the view of things-as-receptacles as posited by Appadurai throughout his corpus. The ideational “end of man” supposedly hailed in *The Order of Things* by the death of God, from where power flowed in pre-modernity, can be seen as an earlier formulation of his commitment to earthly, material things (Foucault, *The Order* 420). In *Archaeology of Knowledge*, Foucault further enhanced notions of discursive materiality by shifting from a continuity focused genealogical approach (Foucault and Rabinow 76–100) to an “archeological method” to deconstruct “discursive formations” and find discontinuities (Foucault *The Archaeology of Knowledge*). This commitment to materiality was best empirically executed in *Discipline and Punish* where he explicitly emphasized how power flowed not *only* from people and social institutions but also from the material constraints of scientific knowledge, technological forms, and the production of bodies (Foucault, *Discipline and Punish* 135–308).

A Foucauldian “thing-power” is also clearly proposed by Jane Bennett in *Vibrant Matter* (Bennett 10). Bennett’s “thing-power” describes how things “become vibrant . . . with a certain effectivity of their own, a perhaps small but irreducible degree of independence from the words, images, and feelings they provoke in us” (Bennett xvi). This proposed new materialism explicitly frames the thing as a something from which power flows rather than the social constructivist view of material as conduit for the flow of power. Bennett’s examples range from power grids to stem cells, but in all cases, material forms push back against the symbolic forces which seek to “construct” them.

Bennett’s “thing-power,” while innovative, shows its limitations when exported to other fields such as archaeological theory. In archaeological theory it is used to make the object-world of excavation sparkle with ever more epistemological and ontological liveliness (Hillerdal and Siapkas 37–65; Witmore; Olsen and Witmore). Rather than a misinterpretation, Bennett’s thing-power leaves archaeologists without the feminist and Marxist influences in other new materialisms (Grusin 193–222; Coole) that are so crucial to attending to “relations of production and to the constitutive role of practical, transformative activity” (Arboleda 1). This investigation uses Bennett’s “thing-power” in order to discuss the *material* as opposed to *social* becoming of archaeological and energy resources. However, this essay’s analysis attends to the socio-material politics of these resources in order to understand contestation of land, labor and identity surrounding the production of the past in Arkadia today. This paper further works to connect these struggles to the reproduction of power relations between institutions of the nation-state and global political order.

In order to carry out this inquiry, this paper engages with the concept of “resource materialities” in order to connect the sketch of a genealogy already provided with the STS subfield, the STS of “the Underground.” This sketch will also feature mixed insights from STS and media theory. Based on participant observation on an archaeological dig in Arkadia, Greece, this essay will proceed to take seriously Appadurai’s observation that the past is *not* a limitless symbolic resource by investigating the politics of two underground resources from which the past *can* be derived: ceramic fragments (tile

fragments or pottery sherds, henceforth collectively referred to as “ceramic fragments”) and lignite coal deposits. The resulting comparative account of the *making* of ceramic fragments as a knowledge resource and lignite as an energy resource intends to provide a description of the practices and enacted categories required to produce these resources (Law and Mol; Mol). To be clear, any binary positions discussed in this essay such as nature and culture, symbolic and material, things as receptacles or things as powerful, ecofacts and artefacts, knowledge and waste, are descriptive of how actors, technical infrastructures and institutions in this case engage with the Arkadian Underground and are not claims about essential qualities.

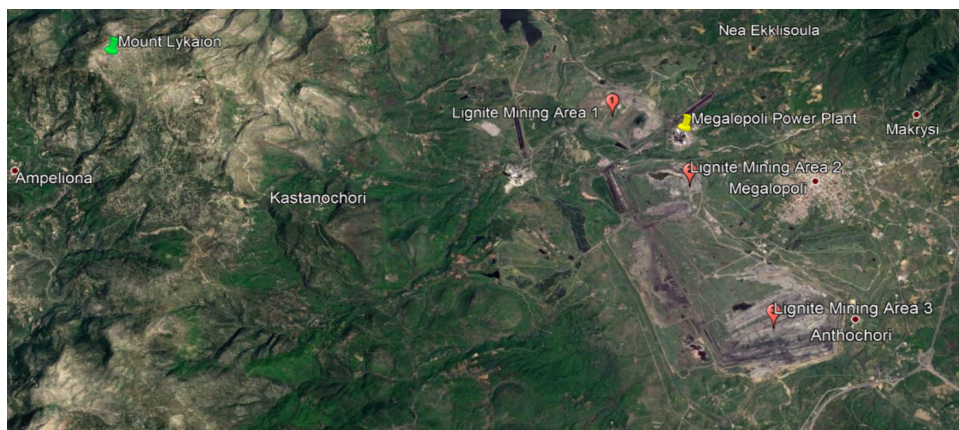
Resulting from this exploration are two main interrelated lines of argument. First, this case adds to the growing body of evidence demonstrating that the “character [of resources] is neither exclusively in their biophysical properties nor in the webs of socio-cultural meaning” (Richardson and Weszkalnys 8). Second, this paper will argue that the case in Arkadia presents a critical space to question the category of “resource” altogether. In response, I propose discursive action. This essay will then finish with an exploration of what the “past” is in a new materialist understanding of materiality and will explore some consequences of this interpretation.

### **Excavation and Extraction in Arkadia, Greece**

The analysis of ceramic fragments and lignite coal I work with in this paper is developed from ethnographic fieldwork participant observing as a topographical survey assistant on the Mt. Lykaion Archaeological and Survey Project located in Arkadia, Greece. The mountain was known in antiquity for being one of two sites where Zeus was supposedly born. As result, Mt. Lykaion is the site of a mountain top ash altar dedicated to “Zeus Lykaios” established sometime between the 11<sup>th</sup> – 14<sup>th</sup> century BCE. There is also a lower sanctuary on the mountain, created in the 4<sup>th</sup> century BCE after the founding of the ancient city of Megalopoli. The lower sanctuary was used for the Lykaion Games, which had an influence on the nearby, and more famed games at Olympia (Romano and Voyatzis "Mt Lykaion Excavation Part 1"; "Part 2") [1]. The project, established in 2008, has been challenging what is known about sanctuary sites and in the process defies traditional conceptions in classical archaeology of center and periphery relations in the ancient world. Mt. Lykaion burst onto the popular archaeology and science scene in 2016 with the discovery of a decapitated skeleton amid the ash mound surrounding the altar of Zeus (Jarus). In the valley below Mt. Lykaion (see Figure 1), observable from the archaeological site itself, are the tallest things in the area: the cooling towers of the Megalopoli power plant that exclusively burn lignite coal, which is mined from “fields” directly adjacent to the towers.

[1] Additional information on Mt. Lykaion can be found in geological and micro-morphological studies of the area (Davis; Mentzer et al.).

**Fig. 1** Map showing geographical relationship of the Mt. Lykaion project, lignite production and Megalopolis. Made with Google Earth by the author.



Lignite coal is an energy resource mined from the remains of an ancient lake in the Megalopolitan basin which filled the valley below Mt. Lykaion some 800,000 - 150,000 years ago. Lignite is created by the decayed agencies of ancient flora and fauna being pressurized by the extreme weight of geological or hydrological forces over long periods of time. Relative to other coals, lignite is the product of recent geo-physical processes and is less energy rich and requires a higher heat to burn. It is among the least efficient coals, providing a mere “975 to 1380 kcal/kg” compared to 5,800 kcal/kg of the standard for export market black coal (“Greek Lignite Reserves and Characteristics”). It is neither an especially monetarily valuable fossil fuel nor “environmentally friendly”; in fact it is largely unsold on the global market as commodity and releases significant amounts of greenhouse gases into the atmosphere along with acrid smoke capable of producing myriad respiratory and other health problems (Health and Environment Alliance). Since lignite at Megalopoli is in the “early stages of coalification” (AP 42) the strata is enmeshed with paleontological remains and requires processing to be used as an energy resource. Limited excavation amid the lignite fields has revealed:

Remains of elephants, cervids, bovids, turtles and birds ... as well as 122 lithics of flakes and cores. This evidence suggests that hominins (early humans) were exploiting the animal resources in the area, and, that this was an elephant butchering site ... the results show that Megalopolis is one of the most promising (if not the most promising) places for future [paleontological] research in mainland Greece. It is one of the few basins of Greece where thick lacustrine deposits have been preserved, burying ... material ... in primary contexts of fine-grained sediments, with continuous sedimentation, preserving the anthropogenic material and the faunal remains. (Voyatzis 3)

The lignite mining and burning operation, owned by the state, employs a significant portion of the Megalopoli (estimates range around 20-40% of the town) and provides 25% of Greece’s lignite energy – which provides somewhere between 45%-63% of Greece’s total energy generation (*Lignite in the Greek Energy System: Facts and Challenges* 5). Lignite has remained the backbone of the Greek power system since the late 1960’s because it is autochthonic, the only combustive energy resource available within the borders of Greece (“Lignite in the Greek Energy System”; Chatzitheodoridis et al.; Roufos 60). Lignite production continues despite dwindling reserves

and stiffening regulations from the European Union (“New EU Emissions Laws”). Fearing the cost of an EU mandated energy transition in its state of near-permanent austerity created by the financial tendrils of the global economy (Varoufakis, *The Global Minotaur*; Varoufakis, *And the Weak Suffer What They Must?*; Varoufakis, *Adults in the Room*; Baruphakēs; Roufos), Greece has little choice but to cling to lignite coal for as long as possible. In recent years, as EU and internal pressure to shut down the lignite plant continues, protests from the local community concerned with the unclear post-lignite future have emerged (“Bigger Interests in Megalopoli”; “Power Worker Walk-Outs”; “PPC Workers Walk Out”).

### STS/Media Studies and Actants/Media

STS has been defined by a sustained critique of modernity’s hallmark: a conceptual separation between what is natural and cultural (Shapin et al.; Latour *We Have Never Been Modern*; Haraway, *Primate Visions*; Jasanoff). This deconstruction of objectivity revealed science as embedded in the social interests of the societies that constitute it; science as/is politics. This sophisticated understanding of science was developed from explorations of non-human entities, which revealed orders of agency outside of human sociality and, within the context of scientific knowledge production, highlighted a dependence on nonhumans as inscription devices and as media for those inscriptions (Latour and Woolgar; Haraway *Modest\_Witness*). This field-wide engagement with naturecultures developed by modernity resonates with the insights of Jane Bennett reviewed earlier. The material-semiotic actor of STS, also known as an “actant,” has relational thing-power.

Media theory followed a similar course as STS to focus on the non-human, moving from Kittler’s work in *Discourse Networks 1800/1900* tracing the agency of technical media forms in the constitution of discursive networks (Kittler) to Zielinski’s argument that the “deep time” of media reveals a paradigmatic history of media defined by significant material-design ruptures which radically reorder space and time (Zielinski), and Parikka’s recent focus on the geology of media (Parikka). *The Marvelous Clouds* by John Durham Peters, deeply influenced by STS’ Bruno Latour, argues for a concept of media which allows them not only to be places for inscriptions important to systems, but also “constitutive parts of those systems.” Peters conceptualizes media as “vessels and environments, containers of possibility that anchor our existence and make what we are doing possible” (Peters 1–2). Combining these insights suggests that power does not only flow from things, but things as media form the “environments” in which power circulates.

Applying this vibrant material approach to the underground has been a recent innovation in STS, led by the STS of “the Underground.” This subfield is defined by an exploration of how the underground “comes to be through interlinked political, economic, cultural, and technoscientific practices and processes” (Kinchy et al.) Most practices involving the underground are extractive and involve so-called natural resources. At the theoretical center of the subfield is the concept of “resource materialities.” Resource materialities take thing-power genuinely in order to challenge the conception of resources



as both consumption-ready material *or* as mirror-like reflections of social value. This critical, new materialist rethinking of the concept of “resource” suggests that resources are “substances that are part of a relational material world” (Richardson and Weszkalnys 7). This is to say that the materials themselves exert relational power and are not just the product of exterior relational forces. STS’ focus on the entwinement of knowledge, expertise, and power allows access to the epistemological and ontological work that is performed to create and separate resource categories in tandem with their material qualities.

In view of this emerging subfield, the question remains *how is the Arkadian underground made to be?* This essay will now explore how the Arkadian underground is made to be by two different, but co-constitutive technoscientific practices which respectively produce ceramic fragments and lignite coal: archaeological knowledge production and energy resource mining and burning. Stemming from an engagement with the past as resource, I argue these practices also reify a distinction between what is natural and cultural tied to greater national political-economic and global cultural discourses. To demonstrate these value generating relationships (E. Ferry 9–10; E. E. Ferry), I introduce the terminology of the “ecofact” and review the extraction and processing of each underground material. In this procedural account, note the similar operative extractive logics and categorical choreography central to the production of ceramic fragments and lignite coal.

**Fig. 2 (left)** Ecofacts awaiting processing. Photo by author.

**Fig. 3 (right)** A purified artifact, i.e. a decontaminated ecofact. Photo by author.



### The Production/Destruction of Ceramic Fragments, Lignite Coal and Paleontological Remains

Before being made to become knowledge (and later waste) by the practices of technoscientific archaeology, ceramic fragments must first be *revealed as artifacts* (see Figure 3), that is “relic(s) of human manipulation of the material world.” An ecofact (see Figure 2) is defined archaeologically as a “relic(s) of other-than-human engagements with matter, climate, weather and biology” (Renfrew and Bahn 85; DeSilvey, *Curated Decay* 323). At the upper sanctuary of Zeus at Mt. Lykaion, thousands of kylixes (a kylix is a small, shallow drinking cup) were smashed around the altar after the ritual imbibing of wine. These kylixes become ecofacts upon their mutable evolution with the ashen remains of sacrificed goat and cattle, the local soil, and other biological and non-biological processes at Mt. Lykaion. Roof tiles are artifacts too, until they slide off their structures, tumble and are subsumed into the earth. Ceramic fragments were created from products of human agency regardless of their environmental

evolution, but equally were ecofacts prior to that manipulation; for example, the clay used to create ceramics is a product of non-human agencies. The circular nature of the ecofact/artifact dichotomy is used in this essay performatively to illustrate the limitations of definitions of nature and culture and to highlight how practices and technical infrastructures isolate resources. Most pertinent to this discussion is that until proper purification ceramic fragments are treated as ecofacts and illegible to the knowledge making apparatus of the excavation.

In order to become legible to the knowledge systems of the Mt. Lykaion dig, the ecofact must be re-made into artifact. Purification involves the removal of “contamination” responsible for it becoming an ecofact. Carefully dug up, washed, and sometimes even chemically treated, read for traces, categorized and captured in knowledge infrastructures, the mutable ecofact is reconstituted as an artifact and its material information transmuted into knowledge by archaeology.

**Fig. 4** New artifacts drying in the Arkadian sun. Photo by author.



Ceramic fragments are first found in the excavation process, after which they are torn from the underground and thrown into a plastic bucket – the first, simple device representative of the greater knowledge infrastructure. The Mt. Lykaion project organizes systematic excavation around “baskets,” which contain archaeologically relevant soil, rocks, and ecofacts found in each basket’s designated layer. The fragments found, frequently many at a time, are weighed when a basket is “closed.” Archaeological finds from baskets are collected in labelled buckets. The buckets of ceramic fragments are then taken to vans which transport them to the dig’s “lab” in the small town below the site, Ano Karyes. At this point the fragments remain media that are illegible to the knowledge systems of archaeology, encrusted with dirt, clay, or with living plants, and mosses. For their traces of the past to become available as knowledge these ecofacts will be further purified into artifacts. This begins with their washing at the lab by the personnel on the dig.

Washing of ceramic fragments can be a laborious activity depending on the ecofactual making of the fragment. For example, upper sanctuary fragments are infamous on site for a thick ecological “contaminant” which makes them difficult to purify; a sort of eco-adhesive made of a combination of goat fat,



droppings, smashed bone, plant materials, and clay which keeps the ashen remains of ancient animal sacrifices glued to the fragments. Ecofacts from other parts of the dig take on the mutable environmental traits of their local area, some coated in a watery clay easily removed, while others – usually in ancient rubbish piles – are found covered in the difficult to remove byproducts of animal and plant decay. Once cleaned of environmental contamination, the fragments are dried in the sun as they assume their identity as “artifacts.” The ceramic fragments are now informational media, purified and ready to be read (see Figure 4).

The newly purified ceramics are then made into knowledge by being run through an elaborate knowledge infrastructure which identifies, captures, and categorizes the relevant information gleanable from treating the purified fragments as containers of information. Pottery experts analyze the fragments under magnification devices, sort them into groups and types, and then capture important features on paper. Eventually they upload this information to a database. The ceramic fragments hold useful pottery and tile specific information in their purified form but are also used to make spatio-temporal measurements of the site by being stratigraphically calibrated with other important finds by the topographical survey team. Each piece of pottery, no matter how small, is run through this elaborate knowledge infrastructure. As media, the fragments are first made into informational containers, but their sheer stratigraphic value develops the reference data environment which informs much of the archaeological site’s work through aligning the individual “stratigraphic units” of each archaeological basket (Balme and Paterson 96–102).

**Fig. 5** Ceramic fragments as “waste” in a backfill pile.  
Photo by author.



Now that the ceramic fragments *qua* media have been read and captured by knowledge infrastructures, the ceramic fragments begin the next ontological step of their journey by becoming waste. Some fragments are so pristinely artifactual, complete or significant in some other way, that they are saved as “artifacts” for the foreseeable future. They are stored temporarily in a near-site laboratory and then later transported to the “apothiki”; a warehouse where they may face further trials of reconstruction by more experts or sit silently on a shelf for decades. For most ceramic fragments (particularly tile) which have made the journey from ecofacts to artifacts, the ground is where they return. Carried back up to the dig site to various areas of “backfill” the fragments are

returned underground as waste (see Figure 5). Technoscientific archaeology, which began the fragments' transformation back into ecofacts from artifacts, has no use for them now. They are the naked waste product of the extractive productive function of the archaeological site. The past has been ripped from these media, read in any way possible, and transformed into bits of information that can be distributed around the world (Latour, *Pandora's Hope*, chap. Circulating Reference; Latour, "Drawing Things Together"). But the present has also been ripped from these media in order to read the past from them, as the ecofacts they had become since entering the ground were destroyed by the always-purifying scientists of the past. As waste, the ceramic fragments are dumped unceremoniously back into excavation backfill pile (see Figure 5), only to become ecofacts again for some future archaeologist, slowly over the millennia acted upon by the climate, weather and biological and nonbiological life (Crary and Kwinter 129–67).

In a remarkably similar fashion to ceramic fragments and their transformation by archaeology, lignite must face the purifying process of transforming from ecofact to artifact by energy production. The lignite is created as an ecofact via the decay and compression of organic material from the Pleistocene. As reviewed earlier, lignite is the product of relatively recent decay and compression processes and thus the lignite fields which feed the Megalopoli power plant are imbricated throughout with paleontological remains (see Figure 6) which must be separated from the combustible material.

**Fig. 6 (left)** A particularly "intact" example of the paleontological material available in the lignite fields. An "elephant" tusk housed in the ad hoc paleontological museum space in the village of Isioma Karión. Photo by author.



**Fig. 7 (right)** Conveyor belts used to move and process lignite before being burnt. Photo by author.

To be a "purified" ecofact and transformed into an interpretable artifact, the lignite must have the paleontological materials enmeshed with it mostly removed. It is first torn from the remains of the ancient lake in chunks only liftable by heavy machinery. Imagine slicing a hill like a cake and it is something like that. But, rather than a sweet with cream between the layers, it is a structure of sedimentary material with layers of lignite coal between. Much like trying to remove the icing or cream from a cake, it is difficult to remove the other fossilized organic materials from the lignite. This task is significant enough that crews of local work men are frequently hired for irregular periods of time to provide human help with the mostly mechanized mining. Some of this help is the removal of larger paleontological structures from the lignite. Given the scope of the operation, human labor is required with complete findings and the removal is generally automated once the materials are loaded onto transportation mechanisms (see Figure 6). The chunks of lightly processed materials are then put on conveyor belts (see Figure 7) which run the to-be-lignite through several mechanical processes that separate the lignite from the surrounding material. Various contraptions shake, sort, and blast the ecofact

until it is an artifact of human manipulation of the material world, a glorious piece of brown coal ready to dirty the atmosphere (see Figure 8).

**Fig. 8** A view on route to the Mt. Lykaion site. Early mornings with dense fogs like this one combine with the byproduct of lignite burning, sulphuric and nitrous oxide, to produce a foul smelling and tasting miasma.



### Resource-Becoming, Knowledge and the Politics of the Arkadian Underground

As reviewed earlier, archaeology is a *historical science*. While interpretative, it depends on reading “traces” of the past left in the material record. When I use the phrase “knowledge infrastructures” I *mean* the variety of knowledges, and technical systems that “read” and store these traces in some sort of extra-human memory. These knowledge infrastructures are as adept at reading paleontological data as they are at reading material from the Pleistocene, Holocene, or Anthropocene. Why is it that the fossilized material pulled out with the lignite is not run through the same knowledge infrastructure as the material pulled from the underground of Mt. Lykaion? Why do these paleontological pasts remain relatively unexplored? The answer can be constructed from thinking through the past as a *resource*.

Despite fruitful explorations of the paleontological materials in the lignite fields, the past of the Pleistocene is not as valuable as the past supported at Mt. Lykaion. Given that Greece has not fared well in the flows of late capitalism (Baruphakēs and Mason), one of its primary industries is tourism formed around its much more recent Classical and Bronze Age pasts (Hanink; Hamilakis; Tamara Maliepaard). The past available from the lignite fields is not this tourist past and thus has little to give the market forces which negotiate the production of the past. With nearly a quarter of the economy involved in tourism, the commodification of the *correct* past is an important objective for the Greek state (Bellos), so vital that arms of the government such as the Hellenic Ministry of Culture and Sports have been developed to wield significant agency in the management of foreign excavations, site maintenance and artifact dissemination (Luke and Kersel 44–62; Hamilakis, chap.2). Greece was never quite the victim of a settler colonialism which would feature the “implanting of settlements on a distant territory” (Díaz-Andreu García xi) but rather has existed as a “post-colony” (“The Postcolonial Bind of Greece”) stricken to regimes of external control through knowledge production systems, resource extraction, elaborate international financial arrangements, and supranational organizations throughout its modern history. Greece’s

relationship to the past is the result of a complicated history of material and cultural control over modern Greece by imperial nation-states and later global organizations of the Euro-American West. Given the covetous attachment of the Western historical imaginary to ancient Greece, modern Greece has developed to cater to this fetishization. Similar flows of colonial and economic pressure influenced the establishment of lignite as the backbone of the Greek energy system.

In the face of a devastating earthquake in 1965, the provincial backwater of Arkadia was recouped by the start of lignite mining and burning. This operation cannot be characterized as the “light” industry that Greece had little but some of at the time, instead it was one of Greece’s first true heavy industries. Proposed and constructed in the years of the Greek military dictatorship, 1967–1974, the lignite operation represents a response to the seething geopolitical environment of not only Greece, but the world. In the post-war years Greece was internally divided over tensions between the political right who cooperated with the Nazi occupiers in the Second World War and the communist left who fought a guerilla war in difficult-to-traverse geographies such as Arkadia (Roufos 11–24). Western states attempting to stabilize the new global economy of American supremacy supported a disastrous military dictatorship famous for the atrocity of the Athens Polytechnic Uprising in 1973. The 1973 global oil crisis also highlighted the problems of relying on external energy sources in a destabilized bi-polar global order (Chatzitheodoridis et al.) In a world of internal and external uncertainty, lignite provided access to a domestic energy resource which could leave the consumption and import-heavy economy of Greece supplied in one of the most crucial sectors of a modern economy. Through these histories we can see how archaeology and lignite are entangled in the story of engineering modernity in Greece. Regardless of this history, how does this relationship continue to be reproduced?

The artifactual product of the epistemological and ontological choreography, the result of two distinct technoscientific infrastructures surrounding the Arkadian Underground, is ultimately two separate, underground resources; a cultural archaeological and a natural energy resource. A figural product of this arrangement is the reproduction of what is cultural and what is natural. Despite the ecofactual evolution reviewed earlier, the journey of ceramic fragments from ecofacts into knowledge and then waste resubmitted to the Arkadian underground, archaeological materials are considered cultural resources. And despite lignite’s material make up and subsequent dislodging of paleontological traces; lignite and the materials with which it is imbricated remains natural. Being natural, lignite is treated as “cheap nature,” a disposable energy resource used for present enrichment (Moore "Anthropocene Anthropology"). Despite its energetic properties, lignite would not be the resource it is without a technical culture which privileges energy production over paleontological data. Deemed cultural, archaeological materials of the Bronze and Classical pasts are made into a valued (in Greece) resource for the historical sciences and eventually, the tourism industry.

Resource materialities challenge inquirers into resources to respect the existent relational properties of things. Engaging with this new materialist frame reveals

that without the energetic power flowing from lignite coal's material capabilities, the nature/culture divide would be unable to be reproduced by the technoscientific sieves reviewed here. Without the dynamic capacities of lignite, the fields which are "one of the most promising (if not *the* most promising) places for future [paleontological] research in mainland Greece," would perhaps be thought of as tantalizing archives of paleontological traces rather than stores of cheap energy autonomy (Voyatzis 3). An all-together different, paleontological-resource rich Arkadia could emerge alongside its archaeological resources. Equal to lignite, the material properties of the ceramic fragments allow their relational accumulation as a resource for the historical sciences. If it were not for ceramic fragment's capabilities for storing traces (artistically placed or not) and combining, or *not* combining with ecological actants, it would not be the valued material it is. With this said, I finish this paper's first line of argument that the Arkadian underground presents an example of the notion of a new materialist understanding of resource materiality. It is neither the human epistemological and ontological dance nor the materiality of stuff itself which produces the underground resources of Arkadia, rather it is the relational negotiation of "the complex arrangements of physical stuff, extractive infrastructures, calculative devices, discourses of the market and development, the nation and the corporation, [and] everyday practices" (Richardson and Weszkalnys 7). In the case reviewed, the subterranean technopolitics of two competing extractive infrastructures, one based on an energetic materiality of lignite, the other historical materiality of archaeological artifacts, combine with global and national capitalist discourses on tourism, development, and the Western historical imaginary, along with the needs and capacities of modern and ancient Arkadia to produce two isolated resources.

What does this new materialist understanding of the Arkadian underground provide to critical work on resources more generally? Besides providing evidence in favor of the theoretical conceptualization of "resource materialities," the Arkadian underground suggests that the category of "resource" is itself an actant with deleterious effects. The framing provided by discursive construction of the word "resource" allows a certain extractive relationship to be constructed around a material in the global economic system of capitalist value (Moore "The Value of Everything"). While the material qualities of resources themselves, per the new materialist approach, must be respected for being "containers of possibility" (Peters 2), the semiotic function of the word "resource" and the value associated with its relational manipulability provides an opportunity for discursive action. The challenge remains for STS and other scholars of resources to write, teach and support political action working to restore the word resource to a useful analytical configuration.

In this spirit of a new materialist ethics which theorizes the world as material, relational and thus plural and open to change (Dolphijn and Tuin 50), the word resource must be retooled in two ways. First, it must be transformed into a shibboleth for the ever-present threat of the immense disturbances that extraction of a resource will bring about. Resources are not simple stores of material but are better described as *sites of relational precarity*. While the global order is not directly affected by the operation of lignite mines in Arkadia, the



epistemological and ontological order-making that predicates exploitation of a “resource” can bring ruin on not only the environmental but also the social landscape of a locality. In the case of Arkadia, the extraction of lignite has revealed a complete dependence on its energetic materiality for the daily existence of the town of Megalopoli [6]. Of course, along with the associated environmental, health, and other hazards of lignite mining (*Guardian*). Further, the lignite dependence has done relational violence on the possibility of enacting more paleontologically and heritage informed worlds. It remains outside the scope of this essay to say whether that alternative present/future would be better. Additionally, not only should “resource” carry a negative connotation of relational precarity, but this negative connotation should be used on supplies of materials which do not neatly fit into the category of “natural” and are rarely treated with the same seriousness as “resources” which fill gas tanks, produce industrial quantities of electricity or are central to the manufacturing of a commodity. Given the similar extractive problematics of archaeology and its co-constitutive activity with other resource extraction operations, archaeological sites might be treated as warily as other sites of relational precarity (resources) with more energetic qualities. This is to say that archaeological, cultural or symbolic resources should be engaged with as dangerous materials like a resource with more energetic materiality would be. While archaeology indirectly produces pollution and other social problems, there is a degree of unabashed symbolic manipulation and cultural interpretation by foreign archaeologists (for example, the Mt. Lykaion project) and institutions (for example, the American School of Classical Studies) that can be argued to be intervening on the country of Greece’s cultural heritage through neo-colonization of archaeological resources. Perhaps this would not persist if archaeological resources were conceived of as resources in the manner in which, for example, oil is respected.

**Fig. 9 (left)** A statue of Theodoros Kolokotronis in the capital of Arkadia, Tripoli. Photo courtesy of Wikimedia Commons. Attributed to user Ddogas  
<https://commons.wikimedia.org/wiki/File:TripoliGreece6.jpg>



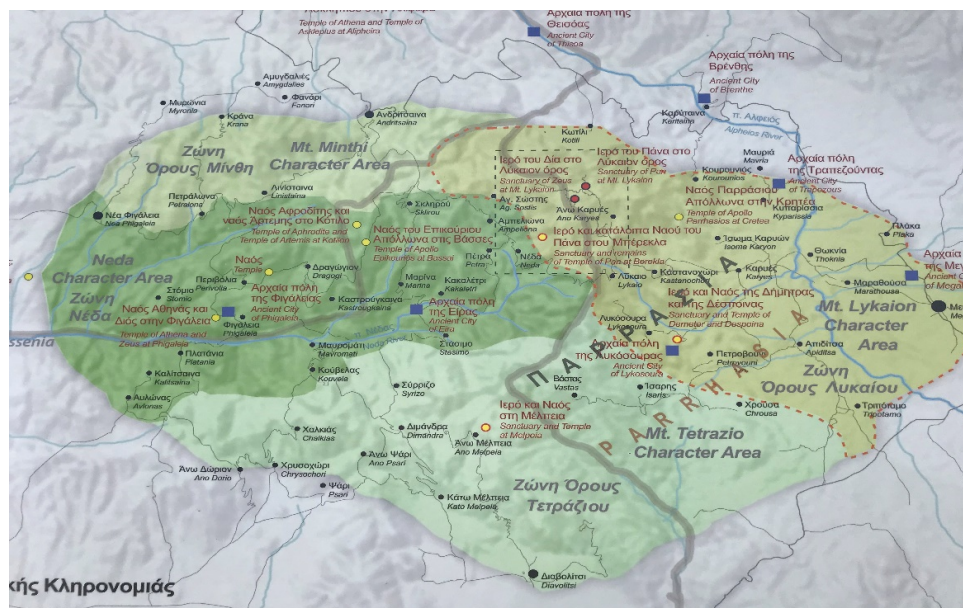
**Fig. 10 (right)** A small monument to the fighters of the Greek Revolution in the village of Neda, near the Mt. Lykaion site but on the Messenian side of the border. Image courtesy of Google Street View.



In the region surrounding Mt. Lykaion, histories of the nation-state past remain more important than the pasts of antiquity. For example, villages near the site are dotted with monuments (see Figure 10) and plaques dedicated to the famed commander of Greek forces in the Peloponnese during the revolution against the Ottoman Empire from 1821-1829, Theodoros Kolokotronis (see Figure 9). In the village directly below the site, Ano Karyes, where the project’s lab space, storage and Greek colleagues are located, the inside of the dining hall is adorned with representations of local figures of this revolutionary past. Even the stories told reflect this close relationship to the histories of resistance, with late night drinking stories from our Greek workmen focusing on the heroism of their communist forefathers against Nazi

occupation. The point is, few wander the Arkadian hills recounting the 2<sup>nd</sup> century geographer Pausanias’ travels (Pausanias and Jones) or resurrecting the mythical identity of the “Parrhassians” (see Figure 11), except archaeologists.

**Fig. 11** A map of Parrhassian Heritage Park — The park will be the first designated dual natural and cultural heritage space in Greece. “Parrhassian” references the mytho-historical southern Arkadian region Parrhasia named after the son of Lycaon —the legendary namesake of Mt. Lykaion. Photo by Author.



**What is the Past?**

I want to end this essay by further exploring what the “past” is under this new materialist approach. Above I introduced the work of Arjun Appadurai regarding the past, noting his insight that the past is a finite symbolic resource. I agree that the past is a finite symbolic resource, but this is the case only because finite social relations organize around the finite material world. Where Appadurai found “norms” operating above the materiality of the past in question, a new materialist rendering of the past follows the sagacious insight that “material things simply are culture” and vice versa (LeCain 110).

**Fig. 12** Archaeologists walk away from a site tour of the ancient Megalopoli theater – which held up to 20,000 people, with the power plant in the background. Photo by author.





The past is neither solely symbolic nor strictly real, but explicitly material. The technoscientific “past” is the articulated reference system of Bowker’s “mnemonic deep.” As seen throughout the case of the Arkadian underground, this “mnemonic deep” does not have a perfect memory. Not only are limited, purified traces read into the deep, and as with most fragments, discarded after a single reading; but more importantly *what* material traces *are read* into the past is subject to the infrastructural politics of resource generating and using technical systems. As seen in the case of the Arkadian underground, valuable traces, for example paleontological materials, can be torn from a resource in the artifactual making of lignite and discarded. Archaeology at Mt. Lykaion equally discards the potentially valuable environmental information on ceramic fragments in favor of producing a specific historical knowledge. Rather than two rival systems, the knowledge and energy infrastructures reviewed in this essay reproduce a natureculture which allows the harnessing of each material’s thing-power. Greece’s neocolonial relationships with the Euro-American West notwithstanding, the desire to highlight the Classical and Bronze Age pasts (see Figure 11) in order to cater to tourism while ignoring the rich past of the Pleistocene confirms another comment from Despina Catapoti: “rights and claims on the past have always been territorial in nature.” I want to direct this insight towards the relationship between the historical sciences and late capitalism rather than the territory of a state. Considering the scientific past requires the past be read from material traces, it appears the territorial dispute in question relative to Arkadia is which parts of the underground belong to the past, and which belong to the capitalist present-future? What matter gets to enter culture? What agencies, human or nonhumans, get to matter (see Figure 13)?

**Fig. 13** A former lignite field being recolonized by agents of non-human becoming. Photo provided to author by Fotis Tzevelekos, who has worked both as an archaeological excavation workmen and lignite miner.



In addition to arguing in favor of new materialist notions of resource materiality and using this case as a space to question how resources are categorized, I’ve also argued a variety of smaller but still important points worth reviewing. With this essay’s focus on resources extracted from the Arkadian underground and the past as a material-semiotic space, I have argued that the scientific past is a taken-for-granted thing that may better be conceived of as a vast, highly alloyed system of memory and reference systems routed through many disciplines and historically contingent institutions. It is ultimately designed to interpret material traces in the stratigraphic record made available by resource excavation. The past is not only a scarce symbolic

resource but a finite material resource which can be conceptualized and analyzed as a resource.

The past is *made to be* and in surprising ways. Following this line of thought, I've argued that it is not solely the interpretive flaws or embedded coloniality of archaeologists, heritage or cultural professionals, or the learned and governmental institutions which scaffold all their actions; but also, the agencies of late capitalism which finds and constructs "natural" resources to use. I've additionally argued that there is a connection between how this global economic condition works to find and construct "natures" for use in production and "cultures" for other differing, but still extractive productive purposes. Hence, I also argue that archaeology and lignite production are co-constitutive technoscientific practices in Arkadia. It was the intent of this article to describe the production of ceramic fragments and lignite in similar terms to show the resonant extractive logics of each operation in the rendering of ecofact to artifact. My use of the archaeological conceptualizations of ecofact and artifact were not intended to certify these categories as accurate, but instead to show the effects of their enactment through the practice of each operation. Categories are used because they work; they perform useful realities for resource making (Bowker and Star). Thinking through the production of ecofacts and artifacts was meant to highlight the capacities of the materials themselves, treating their thing-power with relational respect despite the understanding that the things-in-themselves are not in the object nor "out there" waiting to be assembled in the social.

Inevitably, a new materialist position can be unsatisfying. Locating things such as resources in neither the social relations nor the things-in-themselves by emphasizing the agential productivity of both material and symbolic processes, highlighting the affective dimension of objects and their inextricability with politics, and noting the past as real in material traces and the past-present as indeterminate, are all interesting but non-definitive statements on the relationships discussed in this paper. Despite this potentially unsatisfying neither/nor, I will leave the reader with one last, perhaps more satisfying, thought inspired by scholar of mining Martin Arboleda's corrective for new materialist thinking: "The vital and expressive attributes of technology – and of matter broadly considered – will be but an empty truism if they are not understood as imbricated in relations of class and of production" (Arboleda 15).

This case serves to remind us that *the past* is not "out there" waiting to be discovered, rather it is *produced* by the labor of humans and non-humans. Having argued against the categorical distinctness of natural and cultural resources and for their reconceptualization as sites of relational precarity, my concern for the impact of excavation and extraction on the people of Arkadia is evident. Combining this insight with my argument that archaeology and lignite mining are co-constitutive practices, we can interpret the entire landscape, from Mt. Lykaion to Megalopoli below, as a machine assembled to produce some and destroy other pasts. As reviewed in this essay, archaeological pasts of the Bronze and Classical Age are vastly preferred over paleontological pasts due to the histories of imperialism which have made Greece beholden to the expectations of the Western historical imaginary. The

value of conceptualizing this case's landscape as a machine is that machines *can be broken*. The past is not just something out there, it does not exist in some ideal realm beyond Plato's cave and it is surely not immaterial. That is, the past is political not only in the ideological sense outlined by some scholars (Bond and Gillam; Gathercole and Lowenthal), but materially. The persistence of Greece in the Western historical imaginary is not simply because of its essential symbolic value but is instead a *technical achievement*. Through an anthropological, material analysis of past making, as provided in this paper, avenues towards producing a *better politics of past making* can be explored.

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