

Processing Obelisks, or a Punctual History of Granite and Thermodynamics

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Abstract

All of the obelisks in Rome attest to a long history of process. By process, I refer to their itinerant lives as objects, and also to the modes of interpretations that they have determined, afforded, and received. Roman emperors brought obelisks cut by Egyptian pharaohs to Rome, and sometimes cut their own. Centuries later, nearly every obelisk had fallen, their hieroglyphs were no longer legible, and their lives nearly forgotten. Thinking of the energetic processes that erect, sustain, and destroy monuments, I argue that the obelisks' thermodynamic materiality afforded early modern architects with primary abilities to make sense of them.

Keywords

obelisk; monument; lithics; materiality; process; Renaissance; architecture; Egypt; Rome; granite.

A stone has certainly a history,
and probably a future.
Alfred North Whitehead

Whitehead's Obelisk

In 1919, when Alfred North Whitehead lectured on the concept of nature at Cambridge University, the physicist and philosopher summarised his ideas with an example: Cleopatra's Needle (fig. 1).¹ The Egyptian obelisk on the north bank of London's River Thames, he argued, is an event, which is to say that it is an ongoing material process that is maintained by physical qualities that define it.² We do not perceive the event, but we perceive and make sense of what characterises it. For Whitehead, one of the Needle's primary characterising qualities is

1 Whitehead, *The Concept of Nature*, 106–110. The epigraph is from Whitehead, *Process and Reality*, 121.

2 See interpretations of Whitehead's example of Cleopatra's Needle in Kolb, *Making Sense of Monuments*, 5–6; Olsen, Shanks, Webmoor, and Witmore, *Archaeology*, 119–120; Parisi, *Contagious Architecture*, 286; and Pettit, *Serial Forms*, 242–243.

the stone's red colour. It is from the qualitative that we unfold a complex and entangled history of the obelisk's life, and assess the obelisk as a monumental architectural event that is processed across space and time.

Cleopatra's Needle in London is one of the many examples from world history of the movement and re-erection of Egyptian monoliths—by monolith I mean a single, massive stone.³ Obelisks are not the only format of Egyptian monoliths that were transported across lands and seas. Roman architects installed columns throughout the imperial Mediterranean made from the same Egyptian granite as obelisks.⁴ From Egypt, through Rome, and into the city of London in our modern world, the processing of granite takes place over thousands of years, across the reaches of realms. These processes consumed excessive quantities of energy in order to excise and move blocks of stones that weighed hundreds of tonnes. Such excessive endeavours attest to what is called in economic theory “conspicuous consumption”, where the thermodynamic usage moves above and beyond the requirements of any given society, or is exhausted in luxurious displays.⁵ But there is one other key factor that goes into the erection of monuments: future memory.⁶ The monument must act as a medium of containment, as a storage device that can continue to transmit a message into the future. Egyptian obelisks provide compelling examples of a monument's affordance to carry a message forward to societies that surpass those from the context of their facture.

More recently, scholars outside of physics have proposed interdisciplinary applications of Whitehead's cosmological theory of process as a methodological

3 For Cleopatra's Needle, see Brier, *Cleopatra's Needles*, 126–155; Elliott, “The Needle and the New Zealander”, 434–445; and Elliott, *Needles from the Nile*, the entire book, but especially 129–124. In chronological order, the main surveys of the movement of obelisks are Iverson, *Obelisks in Exile*; Habachi, *The Obelisks of Egypt*, and the expanded German edition with editorial additions by Carola Vogel, *Die unsterblichen Obeliskten Ägyptens*; Curran, Grafton, Long, Weiss, *Obelisk*; and Sorek, *The Emperor's Needles*. Of note are the studies that take into account the longer history of specific obelisks to include their Egyptian lives, such as MacGilvray, “The Odyssey of an Obelisk”, 40–53; and Hilsdale, “Imperial Monumentalism, Ceremony, and Forms of Pageantry”, 223–265.

4 The literature is vast, but for a few examples of the movement of granite in the Roman empire, see Fant, “Ideology, Gift, and Trade”, 145–170; Jones, *Principles of Roman Architecture*, 211; Scott, “Kingship and the Rocks”, 19–29; and Ward-Perkins, *Roman Imperial Architecture*, 87–89, 324–325.

5 See Veblen, *The Theory of the Leisure Class*, 68–101; Trigger, *Early Civilizations*, 74–81; and Calder, *Architecture*, 108–109.

6 Bahrani, *The Infinite Image*. For diverse art historical approaches to what a monument is, and how it should engage with space and an audience, compare Winter, “After the Battle is Over”, 11–32; Koerner, “On Monuments”, 5–20; Vanhaelen, “Recomposing the Body Politic in Seventeenth-Century Delft”, 361–381; Kolb, *Making Sense of Monuments*, and Bass, *The Monument's End*.



Figure 1: Cleopatra's Needle, 1450 BCE, 21m, red granite, London. Obelisk cut by Thutmose III, circa 1450 BCE, and brought to Heliopolis. Muhammad Ali presented it as a gift to England in 1819, but it was not brought from Alexandria to London until 1877, and it was erected the following year. Photograph: author.

mode with which to approach the past. In a special edition of the journal *World Archaeology* from 2021 that aligns archaeology with Whitehead's process philosophy, Lambros Malafouris, Chris Gosden, and Amy Bogaard, argue that "process archaeology invites us to think differently about *change* by fundamentally altering its meaning into *continuous change*, i.e. *becoming*".⁷ Whitehead spoke of this kind of continuous change when he discussed the obelisk in London, an obelisk he

⁷ Malafouris, Gosden, and Bogaard, "Process Archaeology", 1. This recent article is an update to an earlier intervention that proposed the use of Whitehead's theory of process in archaeology: Malafouris and Gosden, "Process Archaeology (P-arch)", 1–17.

mentions that was not on the Charing Cross embankment when he was a boy, and will at some point topple in the future: “where does Cleopatra’s Needle begin and where does it end?”⁸ Instead of taking obelisks and the facts that we have assembled about them as a given—as if their histories were just waiting to be discovered—I want to emphasise instead how obelisks partake in their processing, in their *becoming*. One of the challenges with process archaeology is finding ways to juggle Whitehead’s complex wordplay and theories with few to no actual examples with which to think. The case of Cleopatra’s Needle is a rare example, so I want to take advantage of what Whitehead has offered, which is a case study on Egyptian obelisks.⁹ While there is an abundance of scholarship on obelisks, in this article I want to focus on one cluster of events: the early modern histories of architects who sought to rediscover what these massive fragments from monumental architectural programmes meant.

I bring up monumental architecture strategically here, because there exists already a theory in archaeology that is most useful to histories of art and architecture wherein process, duration, and becoming are integral. In 1990, the McGill archaeologist and theorist Bruce G. Trigger, renowned for his work in Egypt, Sudan, and pre-contact America, published the influential essay “Monumental Architecture: A Thermodynamic Explanation of Symbolic Behaviour”, where he argued “monumental architecture and personal luxury goods become symbols of power because they are seen as embodiments of large amounts of human energy and hence symbolize the ability of those for whom they were made to control such energy to an unusual degree”.¹⁰ To think of architecture with thermodynamics brings process to the fore. In Trigger’s theory, monumental architecture is not a history of objects stuck in a given time, waiting to be accessed by archaeologists, but is a history of monumental architecture as conduits and conveyers of systems of circulation. “Dealing with this problem,” he writes, “takes us back to viewing cultures as thermodynamical systems”.¹¹ By thermodynamical systems, he refers to the infrastructures of energy that compose and combust; from the consumption of food in a labouring body, to the burning of wood to render bronze, and to

8 Whitehead, *The Concept of Nature*, 109.

9 Stengers similarly uses Whitehead’s example of Cleopatra’s Needle to aid in her explanations of his theories in *Thinking with Whitehead*, 41, 75, 86, 99–100, 153–158, 179–191. Other scholars who employ the example of Cleopatra’s Needle to help explain Whitehead include Halewood, *A.N. Whitehead and Social Theory*, 96–98; Lawrence, *Whitehead’s Philosophical Development*, 34, 68–69; Mays, *Whitehead’s Philosophy of Science and Metaphysics*, 49–50; and Shaviro, *Without Criteria*, 17–29.

10 Trigger, “Monumental Architecture”, 125.

11 Trigger, “Monumental Architecture”, 122.

energy that goes into the erection, sustainment, collapse, conversion, translation, and reception of monumental architecture. Monumentality is a physical process.

The reception of obelisks in early modern Europe and their reanimation in monumental building projects are part of this processing phenomenon. Advancing Caroline van Eck's emphasis on the material reception of Egyptian and Egyptianised antiquities, I punctuate that the obelisks' materiality afforded early modern architects with a few qualitative determinants in the search for their meanings—many of which had been obfuscated for centuries.¹² Similarly, Miguel John Versluys has steered the reception of ancient Egyptian art and architecture away from approaching objects simply as communicators of "cultural, religious and artistic concepts": "not only do they passively represent such human ideas, they are active agents in their relationships with people and history simultaneously".¹³ While such approaches to material culture are still somewhat new to art history and Egyptology, it is exactly what Whitehead was advocating for when he brought in Cleopatra's Needle as an example in his lectures on nature. "Cleopatra's Needle," Steven Shaviro argues, "isn't just a solid, impassive object upon which certain grand historical events—being sculpted, being moved—have occasionally supervened. Rather, it is eventful at every moment. From second to second, even as it stands seemingly motionless, Cleopatra's Needle is actively *happening*. It never remains the same".¹⁴ To approach obelisks as events that are always happening, and not just stuck in a time of creation or reception, but also partake in their storying, is this article's aim.

To carry this material approach through, I first survey a rather compressed history of granite, expressing its agential qualities to come to terms with why it was a choice medium for monumental monoliths in Egypt and then in Rome. Then, my point of inquiry is in the fifteenth and sixteenth centuries, when architects tried to resurrect these monoliths' meanings while they also tried to re-erect them in monumental space. I focus on two architects, Leon Battista Alberti and Giorgio Vasari, whose understanding of the obelisks and their materiality come in as examples of Whitehead's bipartite approach to the composition of symbolic form: presentational immediacy and causal efficacy.¹⁵ The media with which one excavates, studies, and imagines the past are what has processed and continues to

12 van Eck, "Excavating in the *Wanderstraßen der Kultur*", 74–98; van Eck, *Piranesi's Candelabra and the Presence of the Past*, 4–8, 13–15.

13 Versluys, "Haunted by Egypt", 16.

14 Shaviro, *Without Criteria*, 18.

15 Certainly, scholars can advance these ideas into other periods, but I begin with Alberti and Vasari as a way to start a conversation.

process our obelisks in question.¹⁶ At the same time, it was the red granite that acted as a qualitative agent in this story.

Granite as a Monumental Medium

The physical quality of size often dominates scholarship on obelisks. They seem immobile in their scale and weight, and yet, have become one of the objects that best illustrates material mobility across the millennia.¹⁷ The architectural historian Alina Payne argues “an object such as an obelisk embodies a displacement narrative and makes it literally visible”.¹⁸ The result of this monumental mobility is a whole new set of questions that must be asked to inquire not only what the obelisk is, but also how the obelisk has been processed and brought to mean something in locations and dislocations. The reception of Egyptian obelisks and the reason why, despite weighing hundreds of tonnes, they have been so portable, has largely been determined by what the obelisks are made of: red Egyptian granite.

Red granite as a monumental medium emerges from a series of events that began with the formation of the prehistoric Egyptian state.¹⁹ In art history and archaeology, we have long employed the Narmer Palette, with relief sculpture of a southern Egyptian king carrying out a blow to northern Egypt, as a way to illustrate the result of these events (fig. 2).²⁰ The story goes that toward the end of the fifth millennium BCE, stable communities began to develop along the Nile river, which supported the formation of centers of production, marketable goods, and trade; including some of Egypt and West Asia’s earliest forms of art and architecture.²¹ Upper Egyptian rulers eventually established control over Lower Egypt

16 Sterne, “Shakespeare Processing”, 319–344.

17 Parker, “Mobile Monumentality”, 275–276.

18 Payne, “The Portability of Art”, 93.

19 Brier, *Cleopatra’s Needles*, 1–11.

20 See Köhler, “History or Ideology?”, 499–513. Davis’ book-length study *Masking the Blow* locates the Narmer palette between two traditions: a prehistoric style of depicting animal hunts, and a pictorial succession where the rule of the hunting animal becomes that of a divine king. For the study of the palette in the history of art and architecture, see Davies et. al., *Janson’s History of Art*, 50–53. Also see the specific and broad application in such scholarship as Davis, “Narrativity and the Narmer Palette”, 14–54; and Rykwert, *The Dancing Column*, 314.

21 The Narmer Palette often accompanies such works as the The Gebel el-Arak Knife in these discussions. See Pittman, “Constructing Context”, 9–32; El-Shereef, “Theory about the Gebel El-Arak Knif”, 506–517; and Abdulghani, “The Iconography of Depicting Naked

in the north, thus also claiming control over a growing enterprise in the Nile Delta.²² While this violent economic strategy is how we speak of the amalgamation of northern and southern Egypt in history, the kings of Egypt converted the complex colonising events into a religious one where the unification of Upper and Lower Egypt brought *ma'at*, or 'order' into existence.²³ For three thousand years, nearly everything that went into Egyptian cultural production—religious, societal, architectural, and artistic—fed into the world-view that Egypt's unification was the establishment of *ma'at*, and that this unification must be ritualised again and again to keep order alive.²⁴ The formation of the early Egyptian state was converted into canonical modes of Egyptian art and architecture. By canonical, I refer to the repertory of materials and motifs that replicated older models as a way to sustain a world view from the past. Egypt is a particularly compelling case, as the canonical mode was sustained, more or less, for three thousand years.²⁵

Granite as an architectural material is exemplary of the Egyptian canonical mode of building monumental architecture and the thermodynamic explanation of symbolic behaviour. Upper Egyptian kings had used the locally sourced red granite that forms the substrate of the entire region around Aswan and the Nile-river island city Elephantine, which has a name that reflects the bulbous and bulky formations of red granite. The earliest uses of this southern red granite

Enemies in Ancient Egypt and Mesopotamia". Davis brought the conversation into art history at the outset of his career, with such disciplinary interpenetrating articles as "The Foreign Relations of Predynastic Egypt 1", 21–27; and even though Frankfort's work has long been outdated, he set a precedent for ongoing conversational questions in "The Origin of Monumental Architecture in Egypt", 329–358.

²² Bard has recently updated her career-long research on the formation of early state in "Political Economies of Predynastic Egypt", 1–36. Also see Wengrow, *The Archaeology of Early Egypt*; and Köhler, who sees the unification as nearly without war, in "The Interaction between the Roles of Upper and Lower Egypt in the Formation of the Egyptian State", 513–540. The succession of economic events was theorised early on in Trigger, "The Rise of Egyptian Civilization", 1–70.

²³ See Stan Hendrickx and Frank Förster, who realign Köhler's optimist ideal of peaceful unification with the realities of colonial conquest in "Violence and the Early Egyptian State", 77–81. For the ideology of unification as *Ma'at*, see Assman's influential book length-studies, *Maât*, published in French in 1989 based on lectures delivered at the Collège de France in 1988, and a separate German book on the subject published in 1990, *Ma'at*. It should be noted that however similar they are, the two texts are not translations of the same book.

²⁴ Frankfort, *Kingship and the Gods*, 51–52, 177–178; Scott, "Kingship and the Rocks", 24–25.

²⁵ See Davis' book-length study, *The Canonical Tradition in Ancient Egyptian Art*.



Figure 2: Narmer Palette, c. 3200 BCE (Early Dynastic), siltstone. Egyptian Museum, Cairo. Photograph: Wikimedia Commons.

are in subterranean monumental tomb architecture, including sarcophagi.²⁶ The qualities of the stone—particularly granite’s extreme hardness, compactness, and durability—no doubt all provided valuable reasons to ensure the longevity of the dead’s built environment. Soon, the stone picked up a ritualistic association. Because the old kings from Upper Egypt used southern granite as one of the construction materials for their tombs, it became linked to their legacy, and the stories of unification, and it was brought north to be used in such monumental projects as the pyramidal tomb complex at Giza (fig. 3).²⁷ Later replications emulated the movement, from south to north, as a ceremony of unification. Despite millennia of social changes and dynastic shifts in power, granite was retained as a material that over the years amplified its marvelous affordance as a medium of Egypt’s unification.²⁸ The pyramids at Giza, Whitehead would also claim in the

²⁶ The granite in Den’s tomb was first noted by Petrie, “This tomb appears to be one of the most costly and sumptuous, with its pavement of red granite,” in *The Royal Tombs of the First Dynasty*, 1:4. Also see references to granite in early tombs in Bard, “The Emergence of the Egyptian State”, 68; and Smith, *Egyptian Architecture as Cultural Expression*, 35.

²⁷ Arnold, *Building in Egypt*, 164–176.

²⁸ Badawy, *A History of Egyptian Architecture*, 1:64; Krauss, “The Length of Sneferu’s Reign”, 43–50; Scott, “Kingship and the Rocks”, 25–26.

same lectures at Cambridge, are similar to Cleopatra's Needle in that they are each a durational event that is often thought of as a static object from the past.²⁹ The physical truth is that they continue to be new events, or as Shaviro puts it, "You can't bump into the same obelisk twice".³⁰ The revealed granite encasement of the pyramids at Giza that had once been covered, and the many boulders from this encasement that have fallen to the ground and now rest at the pyramid bases, attest to Gilles Deleuze's application of Whitehead's cosmological ideas in his own philosophy: "the Great Pyramid signifies two things: a passage of Nature or a flux constantly gaining and losing molecules, but also an eternal object that remains the same over the succession of moments".³¹ Monumental continuity is the durational process of the physical energy that permits architecture to stand, and it is also what slowly changes it and takes it down. Even granite, as heavy and hard as it is, has come to signify the arrest of monolithic mobility in seemingly stable monuments. This arrest charges each pyramid and each obelisk with dynamism.

For thousands of years, so much granite poured out of Upper Egypt that Siegfried Giedion exclaimed "the granite quarries of Aswan in the south were inexhaustible".³² Most of Egypt's obelisks that we know of in the world today—including Cleopatra's Needle—were sculpted during the imperial dynasties of what is called the New Kingdom that rose to power in the middle of the second millennium BCE. The quarries in Aswan that had served the previous generations for centuries became the important matrix from which a lithic rhetoric of empire, unity, and *ma'at* could be achieved. The obelisks made of Aswan granite were always part of the designs for architectural programmes, and nearly all of them were cut in sets of two and set up in pairs at the pylons—the gates—of Egyptian Temple precincts. But during the New Kingdom, something else amplified the reception of obelisks. The Roman historian Pliny wrote, over a millennium and a half after the New Kingdom pharaohs, that the monoliths were believed to be hardened rays of the sun.³³ Indeed, in ancient Egyptian cosmology, the obelisk and its tip had a phallic engendering that were connected to the deity who became associated with solar power.³⁴ So for Pliny to hear, centuries later, that they were hardened beams of the sun—and thus the sun god Ra—might just be a game of

²⁹ Whitehead, *The Concept of Nature*, 49–51.

³⁰ Shaviro, *Without Criteria*, 20.

³¹ Deleuze, *The Fold*, 79.

³² Giedion, *The Eternal Present*, 148.

³³ Pliny, *Natural History*, 10:50–51 (36.14). See Swetnam-Burland, *Egypt in Italy*, 90.

³⁴ Swetnam-Burland, *Egypt in Italy*, 69; Frankfort, *Kingship and the Gods*, 153–154, 380–381, n. 26–27; Pollini, *From Republic to Empire*, 215–216.



Figure 3: Aswan granite casing blocks from the Pyramid of Khufu at the Giza Necropolis, c. 2580–2510. Photograph: author.

telephone. Through formal analogy alone, the phallic connection was made in the Renaissance at least by 1524, when Pietro Aretino referred to the obelisk's shape,

while cunningly using it to poetically refer to another man's erection.³⁵ What is certain is that from the time that obelisks were cut, and for millennia after, they served as architectural skyscrapers that were believed to store and transmit the sun god Ra's energy while connecting to the rhetoric of dynastic imperium.³⁶ Ancient Egyptians ensconced religion and politics in obelisks.

Making an extremely valuable resource appear inexhaustible conveyed a ruler's divine control over nature. But sometimes, nature could kick back. One example of this is now a popular tourist attraction in the city of Aswan. An obelisk cracked while labourers were carving it out of the mountainside, and a monolithic monument was of no use if not in one piece, so they left it there, unfinished (fig. 4).³⁷ Thousands of years later, it now provides archaeologists and historians of art and architecture with an example, and model, of how ancient Egyptians cut obelisks out from the rock.³⁸

In ancient Egypt, these monoliths were called *thn* or *tekhen*—plural *tekhenu*—which refers to them as things that pierce, which is tempting to say that they scraped the sky.³⁹ The Greeks retained the piercing quality but named them ὀβελίσκος, “obeliskos”, which means “little spit”, and the Romans borrowed from the Greek word and referred to them in Latin as *obeliscus*.⁴⁰ In medieval Europe, they were called pyramids because of their shape, and needles, again because of their shape, but also because of their entwined etymology with the Greek verb to pierce.

By the fifteenth century, when humanists and archaeologists began digging up languages and materials from the past, the Greco-Latin word “obelisk” returned to use.⁴¹ If, as Caroline Vout argues, “anyone interested in ancient Greek and Roman art today looks at it through a Renaissance lens”, then it is necessary to point out as well that anyone in the Renaissance interested in ancient Egyptian art looked at it through an ancient Roman lens.⁴² It was through Rome's appropri-

35 Curran, Grafton, Long, and Weiss, *Obelisk*, 67.

36 See Bell, “Divine Kingship and the Theology of the Obelisk Cult in the Temples of Thebes”, 17–46.

37 Brier, *Cleopatra's Needles*, 11–18; Curran, “Obelisks in Ancient Egypt”, 1777–1778.

38 Arnold, *Building in Egypt*, 36–40, for the movement of monoliths see pages 66–70; Stocks, *Experiments in Egyptian Archaeology*, 75–76, 238; Klemm and Klemm, “Building Stones of Ancient Egypt”, 635–637. Also see the monograph by Klemm and Klemm, *The Stones of the Pyramids*.

39 Curran, “Obelisks in Ancient Egypt”, 1774.

40 Curran, Grafton, Long, and Weiss, *Obelisk*, 14–15; Swetnam-Burland, *Egypt in Italy*, 68.

41 Curran, Grafton, Long, and Weiss, *Obelisk*, 66–67.

42 Vout, *Classical Art*, 97.



Figure 4: New Kingdom Obelisk left in the ground at the red granite quarry in Aswan, Egypt. Photograph: author.

ation of obelisks that Renaissance architects came to know about these ancient Egyptian monuments.⁴³

Over a thousand years after the last obelisks had been cut from the Aswan mountains by New Kingdom pharaohs, Rome's first emperor, Augustus, began orchestrating their shipment from Egypt to Italy.⁴⁴ Augustus set into motion an entire market for the provincial stone, and Roman emperors after him reopened the quarries in Aswan to supply new demands. Roman emperors also opened new quarries in the eastern Sahara mountains that ancient Egyptians had never cut.⁴⁵ Granite existed throughout the Mediterranean, but in the Roman empire, Egyptian granite was a noble standard because of how it was handled and employed by the mighty pharaohs of antiquity. For his imports of Egyptian granite monoliths and other stones, Augustus was famously remembered, through the writings of Suetonius and Cassius Dio, as the emperor who converted the city from brick to

43 Schneider, "Nicht mehr Ägypten, sondern Rom", 155–171.

44 See Swetnam-Burland's exact study "*Aegyptus Redacta*", 135–153.

45 See Russell, *The Economics of the Roman Stone Trade*, specifically the chapters "The Market for Stone", 8–36, and "Quarrying", 37–94.

marble.⁴⁶ In his guidebook to antiquities in Rome, the architect Andrea Palladio echoed their words when he wrote that Augustus inherited “a city of bricks, but left it full of marble”.⁴⁷ But a question Miguel John Versluys has when it comes to the Romans taking command over the use of Egyptian monuments is “where then is the agency of the obelisk in the entanglement with Augustus? How, as an object, did it get things going?”⁴⁸ Certainly, Augustus’ appropriation of Egyptian religion—which included crowning himself Pharaoh and having his own image sculpted in canonical style—set a precedent for successive Roman emperors who did the same in Egypt and in Rome (fig. 5). While obelisks brought from Egypt resubstantiated the monumental media in a translated context, Versluys’ question brings us back to Whitehead. It was the obelisks’ physical qualities that determined and afforded such monumental translations.

Alberti and Presentational Immediacy

“A monument,” the fifteenth-century archaeologist Biondo Flavio wrote, “is a memorial built for posterity”.⁴⁹ Two thousand years after Egyptian pharaohs cut obelisks out of the earth, and over a thousand years after Roman emperors transported them to stand in Italy, Renaissance architects began to use comparative media to excavate their meaning as materially charged monuments.

Before 1450, while Leon Battista Alberti was serving as Pope Nicholas V’s architectural advisor, he excavated parts of Rome’s Circus Maximus and found broken fragments of an obelisk covered in hieroglyphs (fig. 6). Alberti, delighted with his find, ensured that many of the visitors to the papal courts came to see his unearthed monolith that Rome’s muddy substrate had swallowed up.⁵⁰ We now call Alberti’s obelisk the Flaminian Obelisk, and it stands in Rome’s Piazza del Popolo (fig. 7). But when first faced with the three chunks of stone, how did Alberti make sense of them? For an idea of what the architect was confronted with, one might consider the appearance of another obelisk, broken in three

46 Suetonius, *Lives of the Caesars*, 1:192–193 (2.28.3); and Dio, *Roman History*, 6:68–69 (56.30.3–4).

47 “... e bellissime habitatione dondi Otto Augusto si glorio che havea hauta la Città de mattoni et che la lasciava tutta de de marmo,” in Palladio, *L’Antichità di Roma* Palladio, folio 30v.

48 Versluys, “Exploring *Aegyptiaca*”, 138.

49 “Monumentu[m] ad memoria[m] posteritatis”, in Biondo, “*Romæ instauratæ*”, 42.

50 Grafton, *Leon Battista Alberti*, 105, 253–255; Curran and Grafton, “A Fifteenth-Century Site Report on the Vatican Obelisk”, 239.



Figure 5: Augustus as Pharaoh offering Ma'at, relief on exterior of Temple of Kalabsha, Egypt, c. 30 BCE. Photograph: author.

parts, in a sixteenth-century print of Rome's Circus Maxentius (fig. 8). Cut by the Roman emperor Domitian in the Egyptian style, and now standing atop Bernini's fountain of the four rivers in Rome's Piazza Navona, the obelisk laid in pieces for most of its early modern life as a fascinating and confusing cluster of red granite with illegible hieroglyphs. Physically, Egypt's material presence in the formation



Figure 6: Leon Battista Alberti, Self-Portrait, c. 1435, bronze, 20.1 x 13.55 cm. Washington, D.C., National Gallery. Accession# 1957.14.124.



Figure 7: Flaminian Obelisk, c. 1280 BCE, 24 m, red granite, Rome, Piazza del Popolo. Obelisk cut by Seti I and, brought to Heliopolis by Ramesses II. Later brought from Heliopolis to Rome by Augustus in 10 BCE as imperial booty. Photograph: author.

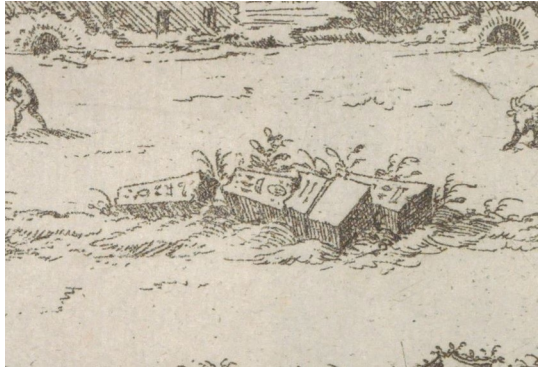


Figure 8: Detail of Domitian's obelisk from Etienne Dupérac, *Circus of Maxentius*, published in *I vestigi dell'antichità di Roma* (Rome: Lorenzo della Vaccheria, 1575), engraving, 19 x 38.5 cm. Amsterdam, Rijksmuseum.

of the Roman empire was nearly forgotten. No new obelisks had been cut for centuries, and all but one of the many brought to stand in Rome had toppled and succumbed to interment.⁵¹

Before Alberti could begin to make sense of his finds with histories—that is, written words—he began by comparing what he found with other artefacts: physical materials from the past.⁵² The stones that Alberti surfaced were a mix of red, black, and white minerals, hard, quadrangular, and slightly tapered toward one end. The most relatable thing in Rome was the one last obelisk that had remained standing in the Vatican Circus beside the fourth-century Basilica of Saint Peter (fig. 9). It was clear to Alberti when he dug up the pieces of stone in the Circus Maximus that he was looking at something that was similar to Rome's other obelisks, especially the famous one that stood in the Vatican. Alberti's initial process is what Whitehead identified as “presentational immediacy”, one part of the culmination of sense perception that yields symbolic form: “[it] is our immediate perception of the contemporary external world, appearing as an element constitutive of our own experience”.⁵³ Presentational immediacy begins with the size, shape, and colours of things that are at the fore of our ability to make sense of them.⁵⁴

51 Curran, Grafton, Long, and Weiss, *Obelisk*, 62.

52 For the difference of histories and artefacts in archaeological method, see Trigger, *A History of Archaeological Thought*, 45.

53 Whitehead, *Symbolism*, 21.

54 Whitehead, *Process and Reality*, 121.



Figure 9: Vatican Obelisk, c. 1500–1100 BCE, 25.5 m, red granite, Rome, Vatican Square. Obelisk cut by an unknown pharaoh, whom Pliny names Nencoreus, son of Sesosis. Originally stood in Heliopolis, brought to Alexandria in 30 BCE, then to Rome by Caligula around 37 CE. Photograph: author.

Presentational immediacy is a deeply embodied and sensual event, which is to say that one person's assessment of a thing's qualities differs from the next. Individuated worlds of experiences determine how Alberti, you, or I, would first make sense of a stone that we uncover from the ground.⁵⁵ For example, Alberti turned to presentational comparison and refreshed his knowledge on a comparable form, the Vatican obelisk, to make sense of the obelisk that he pulled from the ground.⁵⁶ But there was a small problem, since there were no clear directives

⁵⁵ Manning, *Always More than One*, 16–30.

⁵⁶ Grafton discusses a few obelisks throughout the book *Leon Battista Alberti*, notably in the last four chapters, 189–330.

as to what the Vatican Obelisk actually was. At some point in the Middle Ages, many had forgotten that it was the emperor Caligula who had brought the obelisk to Rome to stand on the spina of Nero's Circus. Archaeologists such as Biondo had noted Caligula's role in conveying the Vatican obelisk to Rome. Or at least, Biondo admits, this was what the ancient author Pliny had written down.⁵⁷ Pliny had also written that the obelisk in the Vatican Circus had broken, and so since the one that stood through the ages was clearly still intact, medieval viewers forged new histories.⁵⁸ At an unknown point, shortly after the decline of imperial Rome in the fourth century CE, it became common belief that the Vatican obelisk was a tomb monument for Julius Caesar, and that the bronze orb at the top was hollow and filled with the ancient Roman's cremated ashes.⁵⁹ Other myths had placed the obelisk at the site of Christian martyrdom, which translated the ancient monolith into a relic.⁶⁰ And some believed that because the obelisk was ancient and Egyptian, its stone body was possessed by demons from an unknown world. But Alberti wanted to do away with this kind of lingering mysticism in the name of science.⁶¹ He did not know exactly what the Vatican obelisk was, but he knew from ancient authors that similar monoliths were cut from mountains in Aswan, in the south of Egypt, and that Roman emperors brought them to Rome.⁶² Alberti hoped to convert medieval beliefs in demonic stones into philosophical enquiry and knowledge of architecture engineering that were both led by wonder. "Philosophy," Whitehead would claim centuries later at a lecture at the University of Chicago, "is the product of wonder".⁶³ Alberti certainly had plenty of comparative artefacts to think with, but how much did he know about the stone from which they were made? Albeit without hieroglyphs, the presentational immediacy of the Vatican obelisk provided Alberti with material analogy and a place to begin researching.

With the help of his massive library of ancient texts, the architect discovered that another obelisk had been brought to stand in the Circus Maximus, which was where he found his blocks:

⁵⁷ Biondo, "*Romæ instauratæ*", 231–232.

⁵⁸ Pliny, *Natural History*, 10:58–59 (36.15).

⁵⁹ Curran and Grafton, "A Fifteenth-Century Site Report on the Vatican Obelisk", 245; Rowland, *The Culture of the High Renaissance*, 172–173.

⁶⁰ Curran, Grafton, Long, and Weiss, *Obelisk*, 64–67.

⁶¹ Curran, Grafton, Long, and Weiss, *Obelisk*, 78.

⁶² Pliny, *Natural History*, 10:48–59 (36.13–15).

⁶³ Whitehead, *Nature and Life*, 9.

From the historian Ammianus, I read of an obelisk conveyed from the Nile in a ship with three hundred oars, and then drawn on rollers from the third milestone outside the city, through the Ostian gate, and into the Circus Maximus; thousands of men laboured to erect it, and the whole circus was filled with machines made of extremely tall beams and immense ropes.⁶⁴

The passage Alberti paraphrases by the fourth-century CE writer Ammianus Marcellinus describes the obelisk that now stands outside of the Lateran Palace (fig. 10). But even though in its ancient life it had stood on the spina of the Circus Maximus, it was not the obelisk that Alberti had found. While Ammianus clearly wrote that the emperor Constantine had brought a massive obelisk over to Rome from Egypt, he unclearly brackets this history by discussing two other obelisks that the emperor Augustus had brought to Rome centuries before.⁶⁵ In a similar source, Pliny informed Renaissance architects that Augustus' obelisks were the first two that the emperor brought over from Egypt.⁶⁶ Augustus erected one of these obelisks, Pliny and Ammianus both wrote, in the Circus Maximus. In a recitation of Alberti's archaeological reports at the Circus Maximus, the architect seems to be confused:

They say that Augustus first brought over a great stone which had been dedicated to the sun in Egypt, but then, terrified by its size or by religious scruples, did not dare to raise it and left it unused in the ground; at last Constantine and his descendants raised it.⁶⁷

Ammianus was talking about two different obelisks: one that Augustus erected in the Circus Maximus, and another that he left untouched; but then he says that the one left untouched was still in in Egypt when Constantine decided to bring it over.

We now call Constantine's monolith the Lateran obelisk, and perhaps the reason why Alberti was a bit confused when he tried to make sense of it from

64 "Ex Amiano mercellino historico sic comperio. Conuectum ex nilo obeliscum nau remigum trecentorum impositum uolgiis et tractum a terio urbis lapide porta hostiensi in circu[m] maximum. In eoq[ui]bus erigendo multa hominum milia laborasse : tot circo referto machinis altissima[rum] trabiū[m] et uastissimo ru[m] funiu[m]", in *Alberti, De re ædificatoria*, folio n.v.r.

65 Ammianus, *History*, 1:322–327 (17.4.12–16).

66 Pliny, *Natural History*, 10:54–57 (36.14).

67 Vat.lat.1794 folio 139r; republished in Curran and Grafton, "A Fifteenth-Century Site Report on the Vatican Obelisk", 239–240.



Figure 10: Lateran Obelisk, c. 1450 BCE, 32 m, red granite, Rome, Piazza San Giovanni in Laterano. Obelisk cut by Thutmose III, erected by Thutmose IV in Karnak. Brought from Karnak to Alexandria by Constantine in the early 4th century CE destined for Constantinople, but was later brought to Rome instead. Photograph: author.

written histories was because neither he nor anyone he knew had ever seen it. The Lateran obelisk was only discovered at the end of sixteenth century because it had sunk too deep in the swampy Circus Maximus. The only obelisk that Alberti found there was the Flaminian. Ammianus had included a Greek translation of the hieroglyphs on the Flaminian obelisk, which could have helped Alberti interpret

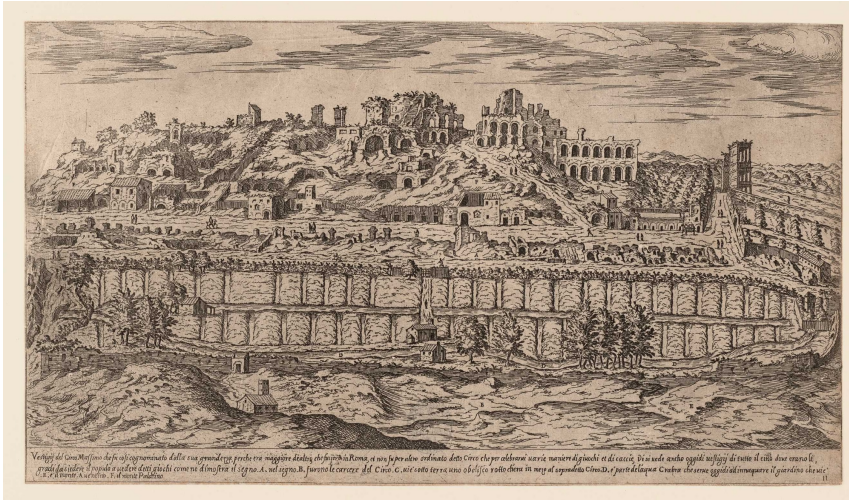


Figure 11: Etienne Dupérac, *Palatine and Circus Maximus*, published in *I vestigi dell'antichità di Roma* (Rome: Lorenzo della Vaccheria, 1575), engraving, 21.4 x 38.5 cm. Rome, Bibliotheca Hertziana—Max-Planck-Institut für Kunstgeschichte, Dg 528-1750 gr raro, folio 0029.

which obelisk the ancient author was speaking about, but the code to deciphering this pictorial ancient Egyptian language had not yet been figured out.⁶⁸ But for Alberti, the obelisk he found was one and the same. For no apparent reason, Alberti's obelisk was forgotten after his life, and sunk back into the swampy Circus Maximus (fig. 11). But later engravers, after decades of interpreting the texts, would imagine what the circus looked like in ancient Rome without having access to either the Flaminian or the Lateran obelisk, that had not yet been rediscovered (fig. 12).

Rediscovering the meaning of obelisks is an example of the formation of symbolic reference in theories of worlding, or how worlds process. Now, it is beyond this article to venture too far into the philosophical debate, but Whitehead's theory of process affords a worlding to happen across entities, by which I mean to say it is not only yours, mine, or Alberti's ability to access an obelisk's world. Rather, worlds continuously form, reform, and emerge, and there is no moment where a world presents itself and can be accessed. This cosmology is

⁶⁸ Ammianus, *History*, 1:326–331 (17.4.17–23). Amin Benaissa confirms that Ammianus' Greek translation is of the Flaminian obelisk in "Ammianus Marcellinus *Res Gestae* 17.4.17", 114–118. For a history of the Renaissance reception of Egyptian hieroglyphs, see Iverson, *The Myth of Egypt*; and Curran, *The Egyptian Renaissance*, 227–243.

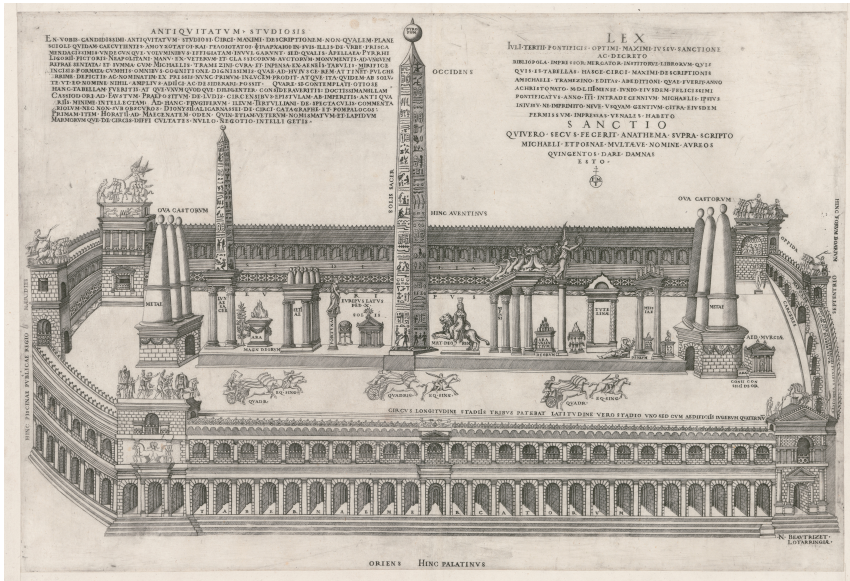


Figure 12: Nicolas Beatrizet after Pirro Ligorio, Circus Maximus, from *Speculum Romanæ Magnificentiæ* published by Michele Tramezzino, 1553, engraving, 38.3 x 55.4 cm. Montréal, Canadian Centre for Architecture. Reference number DR1979:0277.

quite different from Martin Heidegger's theory of how users access a world, as if a world's details can be distilled and known through modern science. Steven Shaviri summarizes the difference between Heidegger's and Whitehead's philosophies with two questions: "Heidegger asks the question of Being: 'Why is there something, rather than nothing?' But Whitehead is splendidly indifferent to this question. He asks, instead: 'How is it that there is always something new?'"⁶⁹ Worlding as an ongoing process takes into account the diverse qualities that engender an event. While you, me, and Alberti perceive the world with our subjective sensibilities, there are many other elements that determine what it is that we sense, and how we sense them. What I am speaking of here is less a technical determinism in its full form, but more a degree of a material's affordance in how an object such as an obelisk is received.

It was the hardness, heaviness, and near impossibility of moving obelisks that shaped their reception. When Alberti found the obelisk, his intentions were archaeological: he wanted to replace mystical attachment to the Egyptian stones with a rhetoric of Roman imperial power; to explain the stones' objectivity

⁶⁹ Shaviri, *Without Criteria*, viii.

through empirical analysis that dismissed medieval speculations. In a fifteenth-century world view, it was Christianity that succeeded Rome's ancient powers, and Alberti began organizing a papal spectacle by planning to move the Vatican obelisk to a new location.⁷⁰ He had read that Ancient Egyptians and Romans cut, moved, and erected obelisks. The entire process was a conspicuous consumption of energy, a thermodynamic waste simply to display a ruling power's ability to command and control the world. In the fifteenth-century, religious succession had afforded a new possibility for the monumental event. If the erection of granite monoliths formed a renowned spectacle of ancient rulers' commands over vast worlds, then so too could they display a modern excessive expenditure of energy. This causal efficacy afforded a rebirth of imperial power, where the obelisks were processed as monumental conduits of thermodynamic rhetoric

Vasari and Causal Efficacy

While presentational immediacy accounts for the formal qualities of sense perception, it is only one part of the process toward symbolic reference. Whitehead's use of the word "symbol" and "symbolic" refers to the understanding of the obelisk as an obelisk, not just as redness, quadrangularness, or hardness. Perception in the mode of presentational immediacy determines the formal qualities of the obelisk, but in order for symbolic form to make sense, another mode of perception unfolds along with form: perception in the mode of *causal efficacy*.⁷¹ Causal efficacy is the palpable inheritance, the qualitative affect of experience; it is "perception of the settled world in the past as constituted by its feeling-tones".⁷² In the case of obelisks, it was the causal qualities of the material that partly determined their reception in the Renaissance as monuments worthy of thermodynamic excess.

Although I am attempting to parse out presentational immediacy from causal efficacy to illustrate Whitehead's theory, they are not purely separable concepts. In the concrete world, presentational immediacy is always co-composing with causal efficacy, and vice versa. For example, I have already resorted to elements of causal efficacy while discussing Alberti. Finding redness, quadrangularness, and hardness, and concluding that they amount to "Egyptian obelisk" is concrescence—the enfolding together—of presentational immediacy (form) and causal

⁷⁰ Greenfield et. al., "Obelisks", 144.

⁷¹ Whitehead, *Process and Reality*, 120–122.

⁷² Whitehead, *Process and Reality*, 20.

efficacy (anachronic relationality). Thus, “Egyptian obelisk” is the symbolic reference in my case. To better understand this second mode of sense perception, I want to take in mind Erin Manning’s argument that Whitehead’s causal efficacy is “what activates perception in such a way that it incites us to *take* the next step”.⁷³ So, once early modern architects had an Egyptian obelisk, what did they do with it?

Unlike many of his peers who believed the obelisks were suspicious things that were likely possessed by demons, Alberti had believed that they were powerful attestations to technology and mechanics that made imperial Roman architecture possible. Alberti continues in his passage to include other large blocks, including column shafts, and the various technical innovations and excessive expenditures of energy required to move and install them. Similar monoliths of the same medium as the Vatican Obelisk were present as columns inside the now demolished Saint-Peter’s Basilica. Architects in the Renaissance knew that these columns, and similar ones in other ancient churches, were taken from Roman architecture and referred to them as *spolia*—a term that implies the reuse of architectural fragments in a new building.⁷⁴ Elsewhere in Rome, such as in temples in the Forum, and on the Pantheon’s portico, red columns accompany grey, and while architects disagreed on the provenance of the grey granite, they knew some of them came from quarries in Egypt’s eastern Saharan mountains, and that all of the eight red columns in the two rear files came from “Syene,” or what Pliny called Aswan (fig. 13).⁷⁵

Granite as a monumental architectural medium was reborn at the end of the fifteenth century, when architects intentionally used the Egyptian stone as a way to resubstantiate the rhetoric of imperial Rome. In the middle of the sixteenth century, Giorgio Vasari included granite in his descriptive list of architectural building materials and expanded the history of the monoliths to include their symbolic value in Renaissance Europe:

One finds another kind of extremely hard stone that is very rough and full of bits of black and white, and sometimes red, which on account of its fibres and grain, is commonly called Granite. Massive deposits of it are found in Egypt, where it is quarried in incredibly

⁷³ Manning, *Relationscapes*, 54.

⁷⁴ Kinney, “*Spolia*”, 16–47.

⁷⁵ Pliny, *Natural History*, 10:50–51 (36.13); Giorgio Vasari assumed the grey granite was from the island of Elba off the Tuscan coast, Vasari, *Le vite...*, 1:27–28; Scott, “*Kingship and the Rocks*”.



Figure 13: Abandoned granite column at Mons Claudianus, also known as جبل فطيرة, in Egypt's Eastern Sahara. Photograph: author.

long pieces, such as one can see today in Rome in the obelisks, needles, pyramids, columns, and in those enormous vessels for baths which we have...

The nearly infinite columns, due to their hardness and compactness, have had nothing to fear from fire or iron. And time itself, that causes all things to fall prey to the earth, has not only not destroyed them, but has not even changed their colour. It was because of this that the Egyptians made use of granite in the service of their dead; writing in these obelisks, with the characters of their strange language the lives of the great, to preserve the memory of their nobility and virtue.⁷⁶

⁷⁶ “Trovasi vn'altra sorte di pietra durissima molto piu ruuida, & picchiata di neri & bia[n]chi, & tal volta di rossi dal taglio, & dalla grana di quella, comunemente detta Granito. Dellaquale si truoua nello Egitto saldezze grandissime, & da cauarne altezze incredibili, come hoggi si veggono in Roma negli Obelischi, Aguglie, Piaramidi, colonne, & in que' grandissimi vasi de'bagni, che habbiamo a San Piero in vincula, & a San Saluato re del Lauro, & a San Marco, & in colonne quasi infinite, che per la durezza & saldezza loro non hanno temuto fuoco, ne ferro. Et il tempo istesso, che tutte le cose caccia a terra, non solamente

There are two key things I want to highlight in this passage: The first is that granite is a difficult medium, the second is that granite is a *medium*. “Media,” as John Durham Peters defines them, “are vessels and environments, containers of possibility that anchor our existence and make what we are doing possible”.⁷⁷ Michael J. Waters has brilliantly laid out the history of the use of granite as an architectural medium in Europe after the decline of imperial Rome—for centuries as spolia, and finally, toward the end of the fifteenth century, as a resubstantiation of antiquity.⁷⁸ One major problem emerged: even though the stone is so hard in large masses, it has a large amount of quartzite in its mineral composition that it makes it brittle and easily cracked when cut, sculpted, and moved. Florence’s renowned sculptors were invited to Rome to bring their knowledge of working with the tricky stone. How could, they wondered, the ancients have handled such a difficult medium with such virtuosity? The whole process amplified granite’s renown, and its mystery.

Decades after Vasari, and nearly a century and a half after Alberti’s early excavations and plans to move the Vatican obelisk, the kind of ancient spectacle that they had read and written about was restaged. In 1586, Pope Sixtus V ordered his architect and engineer Domenico Fontana to move the Vatican obelisk to its current location.⁷⁹ While engineering and machinery had long been able to accommodate columns, obelisks were so much larger that the feat seemed to require supernatural power.⁸⁰ The event is among the most popular spectacles from Renaissance architectural history, and the ostentatious display of the sheathed obelisk and strong men and horses pulling their taut ropes has been reproduced in images for centuries (fig. 14). A range of accounts differ, but the numbers place 800–900 men, and 75–180 horses as major labourers in the

non le ha distrutte, ma ne pur ca[n]giato loro il colore. Et per questa cagione gli Egitti se ne seruivano per i loro morti, scrive[n]do in queste Aguglie, co[n] i caratteri loro strani la vita da gra[n]di, per mantener la memoria della nobiltà & virtù di quegli,” in Vasari, *Le vite...*, 1:27. While Vasari is the only listed author, scholars consider other authors, such as Cosimo Bartoli, to have contributed to the introductory section on materials. Petcu, “Renaissance Architectural Culture”, 432–434.

77 Peters, *The Marvelous Clouds*, 2.

78 Waters, “Reviving Antiquity with Granite”, 149–179. Also see Barry, *Painting in Stone*, 258.

79 See specifically the chapter “Moving the Vatican Obelisk” in Curran, Grafton, Long, and Weiss, in *Obelisk*, 102–139. Also see Long, *Engineering the Eternal City*, 189–213; and Riva, “Picturing Movement”.

80 For a concise history of the machines used to move columns in the fifteenth and sixteenth centuries, see Belli, “Notes sur le transport et le soulèvement des colonnes dans l’architecture des XVe et XVI siècle”, 89–115.

event. Despite its loud presence in the historical record, Sixtus' movement of the Vatican obelisk was only the first of many, and it was not the most complex. The 500-hundred tonne Lateran obelisk, described by Ammianus, was Fontana's greatest engineering challenge.⁸¹ It was in the ancient world the tallest standing obelisk, and remains second to none to this day.⁸² Even though Alberti had excavated parts of the Circus Maximus, it is unlikely that he ever found parts of the Lateran obelisk because it was submerged under twenty-five feet of swampy mud. Sixtus and Fontana unleashed their engineering prowess—now sharpened after their Vatican spectacle of technics—and surfaced the monolith. It seems that Alberti's find from over a century earlier had been forgotten, and time had allowed the three pieces of the Flaminian obelisk to sink back into the earth. Fontana dug around in the Circus Maximus and found Alberti's obelisk. Soon after, he developed a complex method of reassembly, and figured out how to join the pieces of the Lateran and the Flaminian obelisks. Finally, Sixtus had Fontana erect the Lateran obelisk, and he also had him erect Alberti's obelisk where it stands today, as a gift to the people, in the Piazza del Popolo.

The movement of obelisks restaged the powerful programmes of ancient Egyptian rulers who built monumental architecture. At the same time, the spectacles revived the Roman appropriation of obelisks and use of them to convey their imperial might. The late sixteenth-century movement of obelisks was a Renaissance display of thermodynamic excess, intended to revive ancient imperial monumentality in what Anthony Grafton calls the "empire of the mind".⁸³ For van Eck, this empire of the mind is the object scape, where new environments, mediated by objects, changed affective responses to antiquity—a shift that "forced antiquarians, archaeologists and art historians to close their handbooks and treatises and pay close attention to the evidence in front of their eyes".⁸⁴ Granite's histories, known from the textbooks, mixed with its material qualities. Neither one alone determined its receptions, but rather, together they afforded an unfolding of polyvalence and mixed meanings.

Vasari, like Alberti, was primarily interested in Egypt's monoliths as the centre figures of the spectacles of technics and civilization's infrastructure. But while both architects spoke of granite as an architectural material, Vasari spoke of granite as a medium; as an entity that signals, stores, and transmits *something*. In the passage cited above, Vasari is clearly aware of the ancient Egyptian use of red

81 Curran, Grafton, Long, and Weiss, *Obelisk*, 136.

82 Arnold, *Building in Egypt*, 62.

83 Grafton, "Obelisks and Empires of the Mind", 123–127.

84 van Eck, "Excavating in the *Wanderstraßen der Kultur*", 96–97.



Figure 14: Carlo Fontana, Machinery used to lift the Vatican Obelisk in Rome in 1586, in *Templum Vaticanum...* (Rome: Giovanni Francesco Buagni, 1694), engraving, Montréal, McGill Rare Books.

granite as the choice material for tombs and monuments. Pliny's account of granite in his texts on *Natural History* served Vasari as a wealth of information, just as it had for Alberti, a century earlier. Pliny describes the stone as Egypt's medium of choice for massive monoliths and monuments; but he also delivers the crucial fact that ancient Egyptians believed granite monoliths to be solidified forms of solar energy, fragments of the sun god.⁸⁵ For all the rhetoric of empire that granite conveyed to Renaissance architects, they could not shake this one thing: that red granite had once served a religious function, as the medium between the worlds of the mundane and the gods of Egypt.

It was granite's unknown *something* and pre-Christian use that afforded its reception in the age of Sixtus as a demonic medium. Granite served as a powerful medium to pre-Christian religions, and this afforded mysterious Christian beliefs that the ancients had used magic to convey monoliths to Rome and that the deities of ancient Egypt—demons to medieval and early modern Christians—were not only involved with the erection of the stones, but had also remained inside

⁸⁵ Pliny, *Natural History*, 10:50–51 (36.14). See Payne, "Vasari, Architecture, and the Origins of Historicizing Art", 51–76; and Sohm, "Ordering History with Style", 40–56.

them, possessing them.⁸⁶ The papacy ignored the archaeological empiricism of humanists such as Biondo, Alberti, and Vasari, and instead capitalised on common beliefs in order to wield the obelisk's demonic magic as harnessed power. When Sixtus re-assembled and moved the obelisks at the end of the sixteenth century, he performed exorcisms to remove any lingering demons from the stone.⁸⁷ The exorcism of the obelisk is ongoing, and inscriptions at the base of the Vatican Obelisk continuously process Sixtus' binding of the demons to our very day. We must understand the early modern reception of granite as not just a material that was part of the infrastructures of ancient resources, power, and energy, but as solid forms of vibrant, magical and demonic energy itself.

Processing Energy: a denouement

Where Alberti sought to explain *what* granite obelisks were, Vasari sought to explain *why* granite was used. Together, these architects' excavations of materials and meanings reveal how a granite *event* was processed in the Renaissance. Cleopatra's Needle carried the ancient and Renaissance spectacle into the modern era when architects and engineers brought it from Alexandria to stand in London in 1878, and then did the same with its partner obelisk in New York in 1881.⁸⁸ There was nearly half of a millennium of different kinds of "Egyptomania" and understandings of Egypt between Alberti, Vasari, and Whitehead—most significantly they were divided by the decipherment of Hieroglyphs in 1822—and yet the physical qualities of obelisks affected all three to comment on the obelisks' materiality as one of the things that enacted societies to covet them so excessively. Jan Assman and Florian Ebeling refer to the early modern period, before the decipherment of Hieroglyphs, as one with a "Mnemohistory", or a memory of a memory of Egypt, that was particularly driven by materials and ideas about Egypt that those materials conveyed.⁸⁹ From the Nile to the Thames, the granite of obelisks has partaken in the demand for, memory, and reception of, monoliths cut from Egyptian substrate across the millennia.

In addition to the story presented above, I hope that this paper's infrastructure will also draw awareness to examples of excesses and expenditures of energy in the built environment. In Luis Fernandez-Galliano's model of architecture and

86 Curran, Grafton, Long, and Weiss, *Obelisk*, 132–134.

87 Cole, "Perpetual Exorcism in Sistine Rome", 57–76.

88 Brier, *Cleopatra's Needles*, 126–220; Elliott, *Needles from The Nile*, 229–268.

89 Assman and Ebeling, "The Mnemohistory of Egypt", 25.

energy, “architecture can be understood as a *material* organization that regulates and brings order to *energy* flows; and simultaneously and inseparably, as an *energetic* organization that stabilizes and maintains *material* forms”.⁹⁰ Obelisks are captivating examples of architectural organization and thermodynamics because of how much energy has been, not just consumed, but wasted, simply to move them around. While obelisks are part of architectural programmes, they serve nothing in the way of shelter for humans, and are thus evocative of excess at a new stratum: as architecture with no use other than beaming a ruler’s command and power. The kings of Egypt, Greece, and Rome loved to use them, and the later Christian rulers harnessed their analogic power with the past through both their material media, and the spectacle of technics surrounding their mobility.

Recently, modes that process architecture and its fragments have begun to reshape our methods of looking backward. From methodological mottos such as “building-in-time,” “buildings must die,” and “art history in/as an age of combustion,” historians are beginning to move with art and architecture in energetic and durational processes of reception.⁹¹ Most of the world’s obelisks are over three thousand years old, and as Payne claims, a study of their portability not only draws attention to their networks and passages, but also “to forms and materials embedded in objects that cut across the cultural sky like fiery comets”.⁹² Obelisks are things that constitute excess, and massive expenditures of energy have culturally determined their monumental presence in different ages over the course of millennia. Their skyscraping form, and mobility across deserts, rivers, seas and oceans that analogises flow, certainly have cut our ideological, metaphorical, and actual atmospheres.

It is concerning to think that, as excessive as the processing of obelisks seems, our contemporary exhaustion of resources dwarves the thermodynamics of moving monoliths and building monumental programmes with them. As Barnabas Calder and Alex Bremner have argued, we as humans now consume energy—thought to simply sustain us—at levels comparable to the erection of whole pyramids.⁹³ Indeed, deceptively “invisible” wireless and cloud technologies that produce and sustain this very article demand a surge of energy in the material

⁹⁰ Fernández-Galiano, *Fire and Memory*, 5.

⁹¹ Trachtenberg, *Building-in-Time*; Cairns and Jacobs, *Buildings Must Die*; and Hunter, *Painting with Fire*, especially “Art History in/as an Age of Combustion”, 179–184. Similar ideas proposed by historians of art and architecture to rethink our objects of study in relation to time are present in Bahrani, *The Infinite Image*; Mattern, *Code + Clay... Data + Dirt*; Nagel and Wood, *Anachronic Renaissance*; and Powell, *Depositions*.

⁹² Payne, “The Portability of Art,” 104.

⁹³ Calder and Bremner, “Buildings and Energy”, 79–115; Calder, *Architecture*, xi–xxv.

infrastructure of data and communication, a phenomenon that in turn requires an excessive expenditure of energy in the form of cooling media, an ongoing spectacle, that I contend are forms of discreet monumentality.⁹⁴

Scholars have for some time been returning to Whitehead's theories of nature and process to understand our place within a complex ecology determined by thermodynamics.⁹⁵ As punctuators of meaning that are implicated within infrastructures of imperium and the handling of energy, obelisks are wonderfully creepy examples of this networked process.⁹⁶ When Whitehead brought Cleopatra's Needle into his discussion on the concept of Nature, it was not to give a history of the obelisk. Rather, it served instead to remind his audience that beyond the histories that explain the appearance of monuments in the historical record, obelisks remind us of the ongoing transitions that physical cosmologies afford.

"Philosophy begins in wonder," Whitehead claimed at his lectures on nature and life at the University of Chicago in October 1933. "And at the end, when philosophic thought has done its best, the wonder remains".⁹⁷ I hope that the wonder Whitehead has newly solicited across the disciplines can continue to unfold new insights into material culture, duration, and the energetic processes that govern, even if discreetly, the histories of art and architecture.

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⁹⁴ See Starosielski, *Media Hot and Cold*, 198–218; and Siry, *Air-Conditioning in Modern American Architecture*, 235–236.

⁹⁵ Compare Stengers' chapter "Thermodynamics" in *Cosmopolitics I*, 173–261; with Masumi, *The Power at the End of the Economy*; and Debase, *Nature as Event*.

⁹⁶ I am borrowing Chun's use of "wonderfully creepy" from *Updating to Remain the Same*, ix.

⁹⁷ Whitehead, *Nature and Life*, 96.

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