# Material Practices For Deep and Immanent Temporality

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**This paper engages questions of matter and temporality, and particularly ideas of remote time as a material condition and material process of the present. These concepts are explored thought the simultaneous activities of archaeological survey and the development of design propositions for a site in Turkey and encompass the practices of gathering material evidence, digitally mediated material epistemologies, and the design of new material agents within the context of the site's geological, cultural, and ecological heritage.**

## INTRODUCTION

On the Aegean coast of present day Turkey, approximately 20km west of the well-known ancient metropolis of Ephesus, there are a pair of promontories that jut out into the sea, rising approximately 80m above the adjacent agricultural valley. They are part of a series of promontories and low mountains that form the topography of that portion of coastline, however, it can be differentiated from the adjacent hills as it is conspicuously devoid of the covering of shrubbery and vegetation that defines its neighboring landforms (Figure 1). Upon closer inspection, it is apparent that the shape of the hills on the promontory has been modified—flattened into terraces and rectilinear formations. There appears to be remains of structures on its upper plateaus, and the remains of heavy stone fortification walls line its visible perimeter. This is the site of the Ionian city called Notion, which had served as the port of the city of Colophon further up the river valley, and the oracular temple of Apollo Clarios, located about 1.5km to the north. Since 2014, a team lead by researchers at the University of Michigan in partnership with Brown University has been undertaking an archaeological survey of the ancient city. The authors have participated in all of the summer field seasons, and have been working with the team to develop the design of a site management plan for the cultural and ecological heritage of the site that will shape its near and perhaps distant future occupations. This envisions the design of the site as a future park with visitor and archaeological research infrastructure, and also includes the schematic design of new structures to be constructed to support these activities during the transition from an active archeological site to a space of public visitation. This opportunity has also enabled the involvement of architecture students with the on-site activities of the archaeological team and design studios focused on the site. This work, which is still in its formative stages, has prompted us to think more closely on questions of time and its materialization in objects and landscapes. This paper serves as a way to formalize some of the ideas, trajectories, and design explorations that have resulted from these first phases of our involvement in the project. The paper is structured in an aleatory manner where broader ideas drift across a range of activities undertaken through the archaeological survey, designs that we are currently exploring for the site, and speculations by our students.

## TEMPORALITY AND THE ANTHROPOCENE

History is typically described as a succession of events in a linear temporal relationship of distance relative to the present. This is however only one way to understand time (i.e. by measuring it) and in much of lived experience temporality operates in much more complex ways. While philosophies of time in the 20th century, such as those of Paul Virilio, have focused on notions of time and speed, or accelerated time, especially in relation to contemporary technology and media, our work has begun to look to a number of other recent thinkers working on theories of the Anthropocene. They offer other recalibrations of how we might think time differently via its relation to matter; time not as a duration or interval, but as nested material processes, some that have been going on for millennia.

Nobel Prize winning Atmospheric Chemist Paul Crutzen and Eugene Stoermer introduced the neologism 'Anthropocene' as a proposed geological term to define the era when human activities began to cause significant impact on the ecosystems and geology of the earth.[1] Crutzen and Stoermer identified the start of the Anthropocene era to coincide with the Industrial Revolution, when Antarctic ice cores began to register residues of increased levels of methane.[2] Other scientists have more recently argued that human environmental disturbance can be materially evidenced to have begun at the advent of agricultural activity in the Neolithic age.[3] This condition of combined geological and ecological consciousness

Figure 1: Aerial view of the promontory of the ancient city of Notion on the Aegean coast of Turkey. (2015)

precipitates new temporal sensibilities that propose alternatives to ideas of linear, historical time. Artists and thinkers who have been exploring these ideas have become foundational to our work.

"The Bureau of Linguistical Reality" is a participatory artwork of by Heidi Quante and Alicia Escott that aims to create a new language to express feelings and experiences particular to our current context of climate change and other Anthropocenic events. The term "Shadowtime" is coined to describe "a parallel timescale that follows one around throughout day to day experience of regular time. Shadowtime manifests as a feeling of living in two distinctly different temporal scales simultaneously, or acute consciousness of the possibility that the near future will be drastically different than the present." [4]

Philosopher Timothy Morton offers another set of temporal sensibilities. He defines time as a "condition of how things don't coincide with themselves." [5] Morton argues that on one hand time can be considered as "fuzzy and not atomic", and speaks of temporal structures that are not discrete but that somehow leak into one another; he argues that they are necessarily incomplete and entertains the possibility that things may be "*less* than the sum of their parts."[6] Things may not add up. Morton also proposes an alternate way to think of time not as cyclical but as "concentric"; he argues that we need to start thinking "weirdly of time" and entertain the idea that "perhaps history is a nested series of catastrophes that are still playing rather than as a sequence of events based on a conception of time as a succession of atomic instants." [7]

One instance of concentric temporality that we have been thinking about in relation to the project is that Notion lies in the region of ancient Greece that was the birthplace of materialist philosophy, in fact the beginning of philosophy. Just a few kilometers down the coast were the cities of the Pre-Socratic philosophers Thales of Miletus, his pupil Anaximenes, and Heraclitus of Ephesus; who were the first to try to explain the natural world without reference to the gods or the supernatural. They also proposed that matter was in some sense alive and more or less conscious, a term known as hylozoism.[8] After centuries of the rise and fall and rise again of scientific thought, we in our thinking circle back to some of these hylozoic philosophies, weirdly, near the geography where they were first thought. In her book *Vibrant Matter,* Jane Bennett urges a mode of practice that recovers a kind of naïveté, in order to be able approach matter in new ways that operate with its vitality. She suggests that one possibly productive tactic could be to "become temporarily infected by discredited philosophies of nature" and other "premodern attitudes." [9]

Working on site alongside the archaeologists, we undertake a documentary project of the chronotopes of the site for exhibition; the piece is titled "Shadowtime 37°59'31.70"N, 27°11'36.65"E" (Figure 2). Video footage brings into focus some of the site's coincident material timescales—the slow timescale of geology, stones and clays on the site commingled with the much more accelerated one of its current life forms. This is not only a visual installation that we develop but an aural one as well, with the cyclical score of cicadas, birds, wind, and sea rising and falling. A deep, layered drawing is constructed and shown alongside the videos. Between acrylic layers etched with the topography of the site are suspended ancient, current and proposed site maps; images of the cisterns and other fragmented objects found on the site; the migratory paths of birds, the sun, and survey drones; images of the cicadas, snakes, and sheep that now inhabit the city. The work aims to elicit an attunement to the landscape that re-positions human and nonhuman entities into interacting relational fields where hierarchies begin to be flattened. Within our body of work, this project continues a trajectory of "world-building" through practices of combinatory and thick mapping.[10] This body of work informs the design of the future of the site, which is envisioned as a park where both archaeology and ecology are encountered simultaneously and non- hierarchically by visitors. Here strategies for site management and interpretation will allow for a layered coexistence between the site's archaeology, its geology, the current biotic life forms that inhabit it, and the contemporary cultural practices that are attendant to it.

**MATERIAL EVIDENCE**

The context of the archaeological site can in many ways be approached as a locus of temporal conundrums and contradictions. Here, the messy entropy of comingled pasts and presents is materialized into fragmented things that are interrogated to speak for obscured events and configurations of space and matter. Ancient texts written from 6th century BC onward—Hecataeus, Thucydides, Xenophon, Aristotle—refer to the city of Notion, which served as a port to the much larger city of Colophon located about 15km up the valley. Yet the pottery sherds, gathered by the archaeological team from the surface of the site, tell a somewhat different story. These fragments are interpreted to tell us that the remains of the city we find on the promontory, with its regular grid of streets, its massive defensive walls, its large Agora and Bouleuterion, and its more modest temples, was only intensively occupied starting around the 3rd century BC. After the 1st century AD, the city seems to have

Figure 2: Shadowtime 37°59'31.70"N, 27°11'36.65"E. Video stills and Acrylic detail. (RVTR / Velikov & Thün, 2017)

been abandoned. The archaeological team has found very little pottery dating to both before and after this period, and a definitive lack of Roman era structures. There is speculation that, like other coastal Ionian cites such as nearby Priene and Epehsus, Notion was originally built in different location in the valley, and then moved as a planned settlement on its current site some time between the 3rd and 2nd century BC. The reasons for both the planning of the city on that location well as its seemingly rapid abandonment are still a topic of speculation and it is hoped that future excavation related research will be able to provide insights on the biography of Notion.

Due to its position on an exposed rocky promontory at the edge of the sea, the city exists only lightly buried under soil accumulation. Most of the upper portions of the structures are missing—either eroded by earthquake, wind and rain, or, some time after the city's abandonment, removed to be used in other structures. The city remains now as a physical 'thick 2-d,' the lowest stones of the street grid and some of its major structures just visible above the soil. Across the site, the team has found over one-hundred in-situ threshold blocks. With only minimal soil removal, it would be possible to expose the street grid that was draped over the irregular topography of the site and a significant amount of the perimeters of its buildings.

Of the majority of the archaeological remains visible on the site, a substantial number of structures appear to have been constructed from stone quarried directly from the promontory itself; the site's geological matter reconstituted into the prismatic forms of its streets and buildings. The evidence of quarrying has been identified by researchers at multiple locations, including stone removed during leveling of the site for its public spaces and terraces, and tool marks seen on sheared rock faces, especially at the edges of the promontories and behind the theater. The cut stone found on the site includes a variety of carbonate blocks used for major buildings, and a fairly ubiquitous use of conglomerate stone, which is a sedimentary rock composed of a heterogeneous mix of casts of varying sizes, cemented together over millennia. This conglomerate stone turns out to be a relatively poor stone for construction as it decays rapidly when exposed to weather. The exposed seating of the Theater and the Bouleuterion, which were partially excavated in the 1920's, were both constructed from the conglomerate stone and have already seriously deteriorated. The Conservator on the team is quite concerned with how to protect these structures from further decay, and how to protect any new excavations. The team is considering both chemical means of stabilization and the design of new roof structures that can divert rain away from the fragile stone. It is also possible to speculate on some more radical practices of preservation, as was proposed by some of the student designs for the site.

## MATERIAL SPECULATIONS

This project, with its multi-year duration, has allowed us to involve architectural students in a number of ways with the ongoing archaeological research. In the summer of 2015 we traveled with a group of graduate and undergraduate students to Turkey for several weeks, and spent almost two of those weeks on the site with the archaeological team, where the students learned the practices of measured stone-by-stone drawings of the exposed structures. In 2016-17, this project was the focus of an M.Arch Thesis seminar and studio, where students were given access to the massive database of documentation that the survey team had collected and processed, and challenged to speculate on possible future scenarios for the site in the context of the broader Aegean region. The thesis studio was framed within philosophies of the Anthropocene and attempted to cultivate ways of approaching design based within an ecological epistemology, combined with a materialist sensibility, and operating within the elasticity and simultaneity of pasts and futures. Its focus was to construct architectural narratives that would parse relations between humans, nonhumans, technology, and the environment, and the projects enable the exploration for more speculative scenarios and design approaches to the site.

The project "Topokairos" by student Theresa Chua positioned new landscape-based monuments for the Notion site within a broader interrogation of the 'strangeness' of practices and things of the archaeological site. One of her design proposals addressed the question of the decay of the Bouleuterion seating. In the Greek polis, the Bouleterion, or the council chamber forms the heart

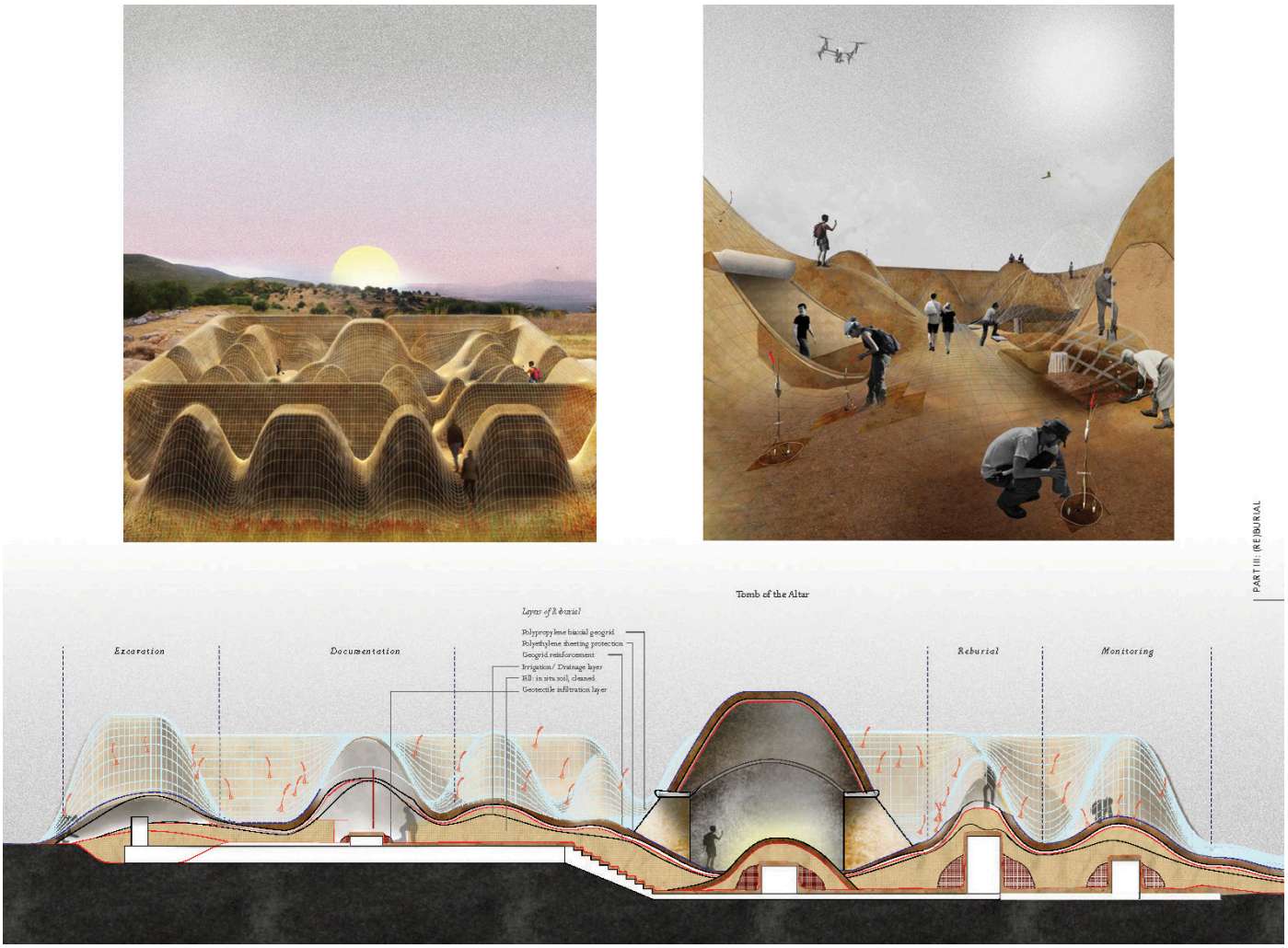


Figure 3: Speculative project by student Theresa Chua for preservation of the Bouleuterion through reburial after excavation, availing the opportunity for a unique landscape experience. (Chua, 2017)

of the democratic governance of the city. The Bouleuterion of Notion, is located on the East side of the Agora, the main public gathering space of the city. Like the Bouleuterion of nearby Priene, is an example of a rectilinear plan, common in the Classical and Hellenistic periods (6th-1st c. BC), that has not been replaced by a Roman, semicircular, Bouleuterion . Its north tiers of seating have previously been partially excavated, and by all evidence it appears that the remainder of its seating tiers remains largely intact below the ground. Hence it is one of the primary locations of interest for future excavation and study.

Ms. Chua's proposal began with a reburial of the Bouleuterion once it has been excavated, documented and studied. Reburial is a fairly common practice in archaeology that is undertaken to protect ancient structures from decay. However, the act of reburial also removes the structure from immediate experience and comprehension of the archaeological site. Theresa's project proposes to rebury the Bouleuterion in a radical way that would create an entirely new landscape of mounds and valleys: a proto-tumulus for a building (Figure 3). This landscape would add a new layer of physical transformation, experience, and entropy to the site, serving not as an attempt to fix the archaeological site within some stable moment of exposure or reconstruction, but to acknowledge it as a continually changing and evolving landscape where monuments may need to die. The status of the buried Bouleuterion structures is monitored through sensor-based probes, which, in the project contribute a new digital landscape of sensing, vision and data streams on the site.

## MEDIATED EPISTEMOLOGIES

The practices of contemporary archaeological survey materialize new relations and intimacies between humans and the matter of the ground. Archaeologist and curator Laurent Olivier writes that "(t)he theoretical strength of archaeology resides in its exclusive relation to material remains, which is what distinguishes it from all other disciplines…[i]t draws its immense theoretical potential from its study of the materiality of the present."[11] This present, shaped by events initiated some time the past, and still going on now—tectonic movement, the alteration of ecologies by agriculture, the movement of stones for construction, the entropy of those stones. Archaeological survey involves both embodied practices of surface

Figure 4: Site survey techniques and machine vision of the site. Above l-r: drone-based spectral point-cloud imaging, drone-based thermal imaging, and magnetic gradiometry. Below: images of a street intersection on the site produced using the techniques above. (2014-2016)

observation, pottery collection, and measured on-site drawings, and practices that are technologically mediated through various forms of machine vision and sensing.

Photographic documentation has been an essential component of archaeological practice since the establishment of the discipline in the mid-nineteenth century.[12] Contemporary practices now deploy a broad range of imaging technologies and instruments, all with the capability to be geo-referenced so that multi-layered GIS-based models of the site can be constructed in digital space, and which can be deployed for continued analysis, situate new design propositions, and for remote virtual inhabitation by digital publics. Low altitude photogrammetry using lightweight eBee drones has provided orthorectified point cloud imagery of the entire site and its environs, at resolution ranges between 6cm and 2cm. This data has been used to create a detailed digital terrain model as well as the production of a physical site model on which we can project imagery of the present, apparent past, and proposed future(s) of the site.

Drone mounted cameras equipped with thermal sensors have been additionally used to thermally image a significant portion of the site. This type of imaging, which operates in the infrared spectrum, is undertaken early in the morning when the there is a greater differential between the temperature of stone relative to the surrounding earth, and has revealed some of the near surface patterns that cannot be readily seen with visual spectrum imaging. Additionally, the survey team has undertaken an extensive program of geophysical prospection, mapping the site with a fluxgate gradiometer. This is an instrument comprised of a pair of magnetic sensors that is passed (by a person walking according to a 1m grid) over the surface of the ground. The gradiometer images near subsurface (approx. 1-2m) disturbances in the earth's magnetic field, caused by objects buried underground. It is most effective in detecting fired materials such as terra cotta, but can also detect other variations in magnetic signature such as soil compaction. Interrogating these various forms of mediated vision side by side, we can start to make out some of the patterns of the remaining city and its structures (Figure 4).

Working together with the archaeologists, we have tried to interpret these strong and weak signals into a possible reconstruction of the configuration of the street grid and the major structures of the ancient city. This has informed plans of how the site may be rethought and redesigned as a cultural and ecological heritage park and as a site that enables further archaeological study (Figure 5). The archaeological practices of excavation, clearing, mowing, planting, and landscape management are considered material practices of site re-design, creating new reorganizations of the matters of the site and new landscape re-formations. The site management plan considers how these landscapes will be shaped, maintained, and communicated, how they will be integrated with practices and economies of the village of Ahmetbeyli in the valley adjacent to the site, what new architectures and structures will need to be constructed to enable both research and casual access to the site, and how they will operate as new material agents that will transform the trajectory of the site in the future.

## MATERIAL AGENCIES

Among the many findings of the archaeological survey is that the limestone body of the promontory has been riddled with holes. As part of the construction of the city, cisterns were carved throughout the site as vessels to gather rainwater from the roofs of public and private buildings. The team has so far identified about a dozen, and it is suspected that many more would have existed to provide part of the freshwater supply for the city. Several have not been filled in and the team has been able to access their interior voids and scan these spaces with 3D laser scanners, providing interior point cloud surface models of these spaces. The ability for the public to virtually access the cisterns is part of a proposal to include AR (Augmented Reality) vision as one of the on-site visitor experiences that we are considering for the future archaeological park.

Members of the team are closely studying the cisterns, as well as evidence of the ancient water infrastructure of the site as the narrative of water is central to understanding the life of the ancient city. This narrative of water relates to both the sustainable supply of potable water for the citizens of Notion, and the location of the waters of the sea around the site.

Another case of concentric temporality is that Notion, like the other Ionian cities along the coast, eventually depopulated and was finally abandoned. Like all cases urban decline, this happened for multiple reasons, but one likely reason that can be speculated on was the

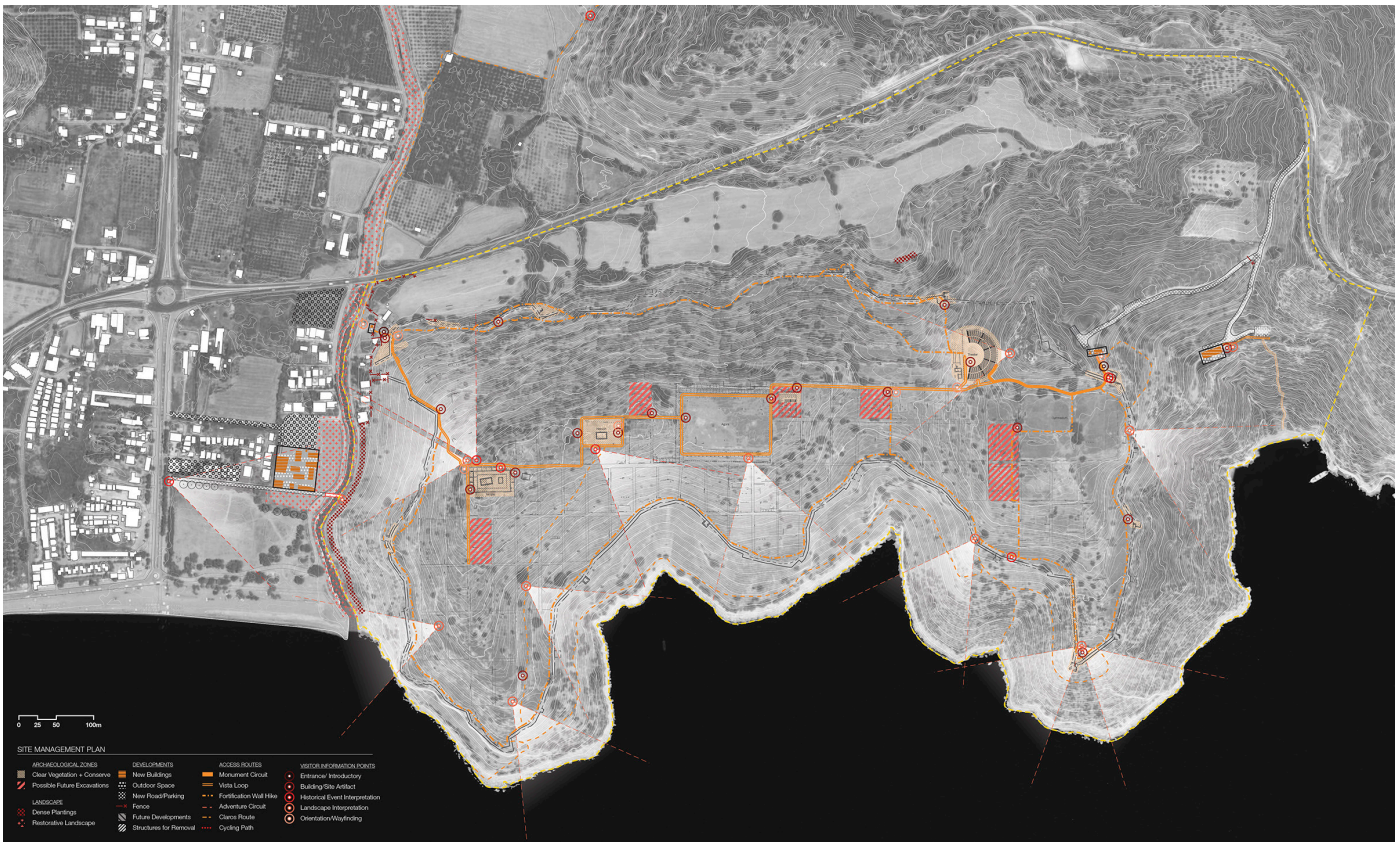


Figure 5: Proposed Archeological and Ecological Site Plan for Notion. (RVTR / Velikov & Thün, 2017)

ecological catastrophe of the siltation of the harbors of the Ionian cities along the coast due to erosion from inland mountainsides that occurred between the Neolithic and Byzantine eras.[13] In the literary references, Notion is described as possessing a significant port, and one that played a major role at least one major sea battle during the Peloponnesian wars. This would indicate that during lifetime of the city, the shoreline should have been located further inland, allowing ships to find safe harbor and to sail to at least the "port gate" identified at the northwestern corner of the city. At this moment, there are new environmental and socio-political catastrophes taking place in the region; it is possible that, in a future scenario of a much warmer planet, that the waters of the Aegean might even start to rise and re-fill the ancient harbor once again.

We think about this as we design the new park, and particularly the excavation house compound, located in the alluvial valley adjacent to the site. This design is currently only in its initial stages, but is being conceived of as a field condition where inhabitable rooms float slightly above the ground and landscaped rooms offer soft topographies to hold water and other plant matter on the site, mitigating situations of potential flooding. We might also begin to collect water like the ancient cisterns, for a future when the Mediterranean is predicted to become more desert-like and with much less rainfall than it currently receives. An aggregate material sensibility will inform the construction of new site structures, for which we are currently exploring discrete material assemblies, reciprocal structures and the emphasis of part to whole relationships across both landscape and building components.

The remains of the ancient harbor and river that led to the city of Colophon are now witnessed in the largely diminished Hales River that flows along the base of the promontory. The river is currently little more than a stream, polluted by agricultural runoff from the farmlands that now occupy the sandy soils of the valley. In the site management plan we propose to explore soft infrastructures to mitigate these runoffs and to control further siltation of the river. Distributed sensing technologies will be used to monitor the effectiveness of these strategies, as well as to provide feedback on water quality and sediment content.

Perhaps not long from now we might be able to use biodigital drones to not only monitor the site, but to also manage pollination and pest control, such as in the speculative thesis project from student Sophie Ni Huan (Figure 6). Ms. Huan's project envisions additionally how a network of small-scaled robots might be deployed to perform maintenance tasks such as vegetation control on the archaeology of the site, or to scan and assess the material stability of the archaeological remains, becoming part of the new ecologies of inhabitants of the site.

## CONCLUDING THOUGHTS

In the speculative and in-progress works described in this paper, the archaeological site becomes a locus where deep and slow pasts collide with new material and digital contemporaries within a constant process of transformation. Here, design eschews the traditional role of approaching sites of cultural heritage as a


Figure 6: Speculative project by student Sophie Ni Huan for a new biodigital ecology for maintenance of the archaeological site and environmental remediation of its adjacent river landscape. (Huan, 2017)

curation of a fixed narrative from the past, and instead approaches the archaeological site as a living present and as a more messy, temporally commingled thing.


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Further information on the Notion Archaeological Survey project can be found at: https://sites.lsa.umich.edu/notionsurvey/

## ENDNOTES


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