2021

A Time and Place: Structures of Knowledge at an Archeological Field-Site

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A TIME AND PLACE:

STRUCTURES OF KNOWLEDGE AT AN ARCHEOLOGICAL FIELD-SITE

A DISSERTATION SUBMITTED TO

THE FACULTY OF THE GRADUATE SCHOOL

IN CANDIDACY FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

PROGRAM IN SOCIOLOGY

BY

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CHICAGO, IL

AUGUST 2021

ACKNOWLEDGMENTS

I want to thank everyone that helped me make this project. I am particularly indebted to the advice, support, and friendship of Dr. Kelly Moore who chaired and advised me through the challenging process of turning ideas into knowledge, and who continues to corner me through a profession that I find eternally confusing. I also want to thank Dr. Anne Figert and Dr. Rhys Williams who shared the confidence and compassion of Dr. Moore to see this project through to the end, as well as Dr. Stephen Zehr for starting me upon this journey into the private and public parts of science. I am grateful for the support and friendships I found in the Sociology Department at Loyola, especially those of Dr. Gwendolyn Purifoye, Dr. Courtney Irby, Dr. Melissa Howell, Dr. Thomas Josephsohn, Dr. Todd Fuist, Dr. Reuben Miller, Dr. Jessica Barron, my fellow Liberators, and Dr. Japonica Brown-Saracino whose collective perspectives, comments, suggestions, and many conversations inform this project, and my scholarship more broadly. I thank Loyola University Chicago for the Graduate Assistantship (2007-2010) which helped support the knowledge and training for this project, and upon which I erect future scholarship. Most importantly, I am grateful for my family, the love and support they gave throughout this project, and with whom life gains meaning and substance.

To my family

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INTRODUCTION

Figure 1. Angel Mounds Dedication Plaque (2011)

Welcome to Angel Mounds

A short distance East from the City of Evansville in southwest Indiana, a 100-acre site called Angel Mounds has been set aside to tell stories about the people who lived there between 1100-1450AD. Archeologists call these people Mississippians, or Middle Mississippians to be more precise, and it is believed that the location was once a large complex of earthworks and other structures that served as a major settlement during that period. Like societies today, Mississippians were not a completely homogenous group, and there were regional and other variations between sites. But it is also not difficult to imagine Angel Mounds as part of a larger group of settlements sharing knowledge, beliefs, practices, and perhaps a sense of identity.

The most obvious feature of Mississippian culture is the use of platform mounds, earthworks with flat tops upon which key buildings were erected. Angel Mounds contains no fewer than 12, and if size is any indicator the site was second in importance only to Cahokia Mounds near what is today the city of St. Louis. Mississippians also shared techniques for producing pottery, as well as an intensive form of agriculture for growing maize, squash, and possibly beans. They used a chiefdom-system with centralized mechanisms of control, and built large stockade or palisade walls around their most significant sites. And the Mississippians shared a system of beliefs associated with the Southeastern Ceremonial Complex (SCC) or Southern Cult, and used an extensive trade and communication network that stretched from the Atlantic Ocean to the Rocky Mountains, and from the Great Lakes to the Gulf of Mexico.

In 1852 Mathias Angel began farming what is today Angel Mounds, but he and his family had no substantial role in the course of the site becoming archeologically significant. In fact, cultivation of the site during the Angel tenure likely destroyed much of the above-ground features thought to have remained before the family occupied the site (Black 1967). It was not until 1938, when the Angel site was purchased by Eli Lilly Jr. on behalf of the state of Indiana, that Angel Mounds began a sustained course towards archeological relevancy. A product of both his time and class, Lilly was an instrumental figure in both the history of Angel Mounds, and the development of archeology in Indiana more generally. The dramatic transition from fertile bottom-land to archeological jewel was a story of circumstance as much as it was one of having a generous benefactor, but in a state like Indiana with a deep mistrust of government programs, it is doubtful Angel Mounds would have become anything approaching the importance it holds today without the support of Lilly and his interest in archeology.

Shortly following the purchase of Angel Mounds, the archeologist Glenn Black began excavating the site with funds obtained through the Works Progress Administration (WPA). The WPA period (1938-1942) is a pivotal point in the story of Angel Mounds, and perhaps more than any other altered the future status of the site. The massive amount of labor provided by the WPA physically transformed Angel Mounds from cornfield to archeological time-machine. And Glenn Black proved to be a prolific archeologist in the field, his work encompassing most of what has been excavated, as well as producing an immense collection of archeological materials which propelled the prestige of Angel Mounds above other sites. After his death in 1964 however, the vast amount of materials he had accumulated were relocated to the Glenn Black Laboratory of Archaeology in Bloomington Indiana, and with their removal a new and distinct phase began at Angel Mounds.

As part of the arrangements for relocating the Black collection, a Visitor Center was built in 1972 with a museum and interpretive structures to help visitors (now absent an on-site archeologist) make sense of the peculiar hills which dot the landscape of Angel Mounds. As a result, what remained above-ground after the death of Black is mostly materials with little or no archeological value, except on rare occasions when notable pieces are made briefly available for special exhibits. Similarly, the activities of archeologists at Angel Mounds are primarily related to demonstrations and public outreach, though excavations do occur on occasion. Time has proven capricious however, and in the four decades since the building of the Interpretive Center many of the original structures fell into disrepair and were removed. Today the landscape of Angel Mounds is mostly empty, and the site has increasingly shifted away from telling only

stories of Mississippians, to holding a wide variety of public and private events to garner favor in a state which is largely unsympathetic to the idea of a public good.

Figure 2. Angel Mounds Aerial View (2006), Angel Mounds Photograph Collection

A Tour of Angel Mounds

There are presently 4 major buildings at Angel Mounds, the largest of which is the centrally located Main Building that includes the museum and staff offices, as well as the auditorium and classroom spaces that were added during the renovation in 2002. To the East of the Main Building sits the Maintenance Building, a structure in every way like a garage except the old desk in one corner that adds the semblance of an office for maintenance staff. Near the Maintenance Building is the Lab, a reconstruction intended to give a nod to the WPA period, and the most recent addition to the site. And at the very front of the property is the Residence and one-time home of Glenn Black. In addition to the buildings, the Angel site is further divided into three distinct areas. At the rear of the property is the archeological heart of the site, which is only accessible to the public through the Main Building. The second area is at the front of the property, which includes the parking lot as well as all the buildings and other support structures

for the site. And the third is a large wooded section to the West that serves as a small preserve for wildlife and city-dwellers eager to escape the noise and chaos of neighboring urban spaces.

When you go to Angel Mounds you will find staff at the desk in the lobby of the Main Building where you pay your $4.00 entry fee, a little less if you are younger or older. At one time visiting Angel Mounds was free, but sometime before 2006 it was decided that an entrance fee could help offset declining government support. You might also see staff moving through the hallways of the Main Building, or at the back of the property operating noisy machines, particularly in warmer weather when staff spend a lot of time mowing and weed-eating to maintain the site. If you go during a school-day you might catch a field-trip in progress, with Angel staff half-screaming in front of 20 or more children who appear mostly uninterested. If none of this is going on, you will make your way through the museum looking at dioramas and reading short informative plaques. There is a logic and progression to things, but many complain it all gets lost in the poor lighting and damage wrought by hordes of school-children over the years.

If you do not end your trip in the museum due to weather, time constraints, or boredom, you will make your way outside through a set of sliding glass doors at the rear of the museum, and from there begin your tour of the grounds. If you are not one of the many visitors who complain about the heat, bugs, unpleasant smells, and absence of teepees, then you will find yourself walking the rear of the property quietly contemplating what remains of the old reconstructions, and reading signs which describe the different mounds, buildings, plazas, and palisades archeologists tell us were present during the Mississippian period. On most days it is easy to feel transported away in the open-landscape of the site, the bustle of modern life fading

away as the sound of wind, birds, and bugs grow with every step. But if you visit during a special or private event, you will feel less alone, and find your concentration broken by others walking the grounds with you, large gatherings, and a crowded parking-lot.

Lastly, if you go to Angel Mounds looking for archeologists it is unlikely you will find any, as professional archeologists are rarely present at the site. Some Angel staff earned degrees in anthropology and archeology, and a few of those participated in excavations before coming to work at Angel Mounds, but none have joined the archeologists in research at the site. In the late spring and early summer professional archeologists do sometimes engage in research, so it is possible you could catch them at work. If you do, they will happily talk with you about stratigraphy, alluvial plains, and geomorphology as they point to different bits of dirt and you pretend to follow along. But such chance meetings are uncommon, and if you see any archeologists it will likely be as part of a crowd listening to them describe the diet of the Mississippians, various techniques used in mound construction, or the exciting possibility that Mississippians may have cultivated beans.

Science and Place

For many, Angel Mounds might appear unusually complicated, perhaps even a bit sullied for those with more rigid ideas about science. Though often described in secular terms, science is essentially something of a sacred enterprise (Durkheim 1995), and in much the same way religious actors use holy sites to connect with their god or gods, scientists make use of their own highly prescribed and ritualized spaces to access a monotheistic truth that lies somewhere out there. The regular absence of archeologists combined with the mundane activities one finds at Angel Mounds conflicts with our shared notions about the kinds of places where science is

supposed to happen (Ophir and Shapin 1991). And just as Anne Secord (1994) described how the pedestrian settings of pubs branded the activities of amateur botanists as anything but Botany, the muddled character of Angel Mounds raises questions about the archeology that happens there.

Yet despite its diverse composition, archeology does happen at Angel Mounds, and for the most part chugs right along with only the occasional disruption over matters of integrity. At Angel Mounds archeology is over and over again, made and remade from the same spots trampled under the feet of school-children playing as Roman legionnaires and their favorite Hunger Games characters, to say nothing of the rodents and roots that make their subterranean homes below. In the museum Archeology is routinely displayed alongside collectible-toys, and the rickety-rack of whatever temporary exhibit happens to be on display to get folks to visit the site. And in the same space archeologists contemplate the serious business of excavations and Mississippian culture, crayons, finger-paint, and construction-paper burst from containers all around which school-aged children use to cut, glue, and smear into their projects for the day.

For social studies of science, the complicated character of Angel Mounds is not an aberration, but a reflection of the relative disorder and contingency one comes to expect of science-in-action (Latour 1987). Since at least Kuhn (1970) social studies of science have revealed the practices of science to be less homogeneous and straightforward than commonly assumed. Even laboratories, those exemplars of modern science, are through and through entwined with the messy politics, careers, and other social considerations that one finds anywhere else (Traweek 1988). It is understandable that some might balk at the jumbled composition of science, particularly given the image that has sustained its authority for so long.

But I believe the many contradictions at Angel Mounds is a call to enrich our understanding of science, more than a call for concern over some elusive notion of purity.

Four Waves

Interest in where science happens is by no means a new occurrence, and the lengthy history of the subject has been described by some as a series of waves (Law and Mol 2001; Henke and Gieryn 2007). The metaphor forfeits the variability and the back and forth that transpired, but in exchange it highlights distinct shifts in how scholars have conceptualized the places where science resides. The first wave is rooted in the philosophy of science, and reflects the positivist and rationalist view which dominated during that period, and which continues to dominate outside of social studies of science. From this perspective, scientific-knowledge is understood as universal, and untethered to the specific locations from which it emerges, gathers, and settles. Through the accumulation of evidence and continual refinement, geographic differences are thought to be limited (if not eliminated) as the power of universal truth asserts itself (Popper 1963). This rationalist view from nowhere (Nagel 1989) does not deny the situated character of scientific knowledge, so much as it minimizes it through cognitive frames which make location irrelevant and inconsequential to its evaluation and understanding.

A second wave emerged with the recognition that the view from nowhere is a socially negotiated accomplishment more than an accurate account of how scientists produce knowledge (Haraway 1991). During this period ethnographers entered labs and began enthusiastically describing the contingencies that influence how scientists interpret data, use machines, conduct experiments, and judge validity (Collins, 1974; Latour and Woolgar 1979; Knorr Cetina 1981; Lynch 1985). These early ethnographies did well to establish the irreducible local character of

scientific knowledge-making, and in doing so rejected appeals to reason and logic alone as explanations for why some theories and practices flourish while others wither. The intense reaction to these early excursions into the lab reflected not only their provocative character, but the implications they had for science going forward. It was the view from nowhere which largely justified the privileged status of scientific-knowledge, and the ethnographic-turn in social studies of science made such a position increasingly untenable.

Despite their critical insights, early ethnographers tended to ignore how labs themselves prescribe the very circumstances they were identifying. Reduced to backdrops for deconstructing a universal perspective, questions about how laboratories were in on the act went largely ignored. To remedy the situation, a third wave of studies emerged with the aim of making laboratories the subject of investigation in their own right. The effort resulted in a collection of studies that describes how distinctive epistemic regimes are produced through the material conditions which laboratories provide (Findlen 1994; Shapin and Schaffer 1985; Shapin 1988; Gooday 1991; Schaffer 1998; Noble 1992; Ophir 1991). No longer mere props, laboratories became protagonists in studies of science as scholars described in rich detail how laboratories built in certain locations, and designed in particular ways, became the right tools (Clarke and Fujimura 1992) for making specific kinds of knowledge.

However, as ethnographers were busy taking laboratories more seriously, a fourth wave emerged which suggested an interest in our houses of science was something of a fool's errand. Informed by developments in Actor Network Theory (ANT), this newest wave emphasized the importance of circulation over what was described as the largely malleable sites where science is located (Callon and Law 1989). From this perspective, studying specific sites is largely seen as a

distraction from the more critical work of analyzing the networks from which everything is constituted. To be sure, ANT has made valuable contributions to social studies of science, but it is difficult to justify reducing our knowledge of science to the analytical desert on which it thrives. Surely any robust understanding of science involves more than tracing networks and describing the relative strengths of association.

Regardless of the ontological hazards which might exist (Callon and Latour 1992), there remains sufficient cause to cast an analytical eye beyond the limited horizon of ANT (Bloor 1999). In fact, Henke and Gieryn (2007: 305) suggest there is still much to learn about the laboratories, field-sites, and museums where science happens, and that the effort to fold sites of practice into non-geographic networks obscures our broader understanding of how science travels. In principle ANT is correct to claim that geography is as malleable as the rest of social life, and that with enough effort space can be transformed, even transcended. However, that ontology largely conflicts with the fact that a good part of science remains anchored to particular sites. Such obduracy given the increasingly mobile and global character of social life should not be ignored, rather it begs further investigation. That is, if the locations where science happens are as mutable as ANT suggest, for what reason(s) do so many fixed sites of practice remain?

A 5th Wave

In the wake of earlier waves, Henke and Gieryn (2007) have called for yet another to address what they see as the continued importance of place in scientific practice. In doing so they noted how anachronistic a focus on discrete sites must appear given the constant motion of scientists, specimens, instruments, and inscriptions racing around the globe (2007: 353), as well as the development of ambitious social theory which describes the compression of space as all

but complete due to technological innovations in travel and communication (Castells 2000; Harvey 1990). But rather than minimizing the importance of where science happens, Henke and Gieryn suggest that the increasingly global practice of science is (perhaps more than ever) dependent upon the fixed sites to which it remains bound. In fact, they claim that it is in part the global standardization of research facilities, and the privileged status of some sites over others, which make the highly mobile character of science possible (2007: 353).

In this fifth wave of studies we are instructed to pay particular attention to the consequences of geographic location, materiality, and the meanings attached to sites. Highlighting the role of geography, Henke and Gieryn describe how the taxonomy of Linnaeus was only possible in Leiden, because that is where the sailors and gardeners necessary to produce such a gaze (Foucault 1970) had gathered (2007: 356-357). Elsewhere, Gieryn (1998) describes how the material arrangements of the Cornell Biotechnology Building prevents the corruption of epistemic spaces with inconspicuous doors, and the presence of strange machinery and odors to keep people and things where they belong. And in his study of farm-advisors in California, Henke (2000) discussed how farmers who were distrustful of laboratories compelled farm-advisors to use field-trials to demonstrate that the knowledge of laboratories was applicable to the fields they plowed. In the end, their focus on geography, materiality, and meanings proved fruitful, and others have followed the lead of Henke and Gieryn with some enthusiasm.

The geographical features of science have garnered a good share of attention. For instance, the work of Bocking (2012a) is exemplary for how he describes the unique tides, marine life, and drainage of the Broughton Archipelago in Western Canada as crucial for determining which species are defined as pests in the region. Similarly, Bocking (2012b)

suggests the creation of the British Nature Conservancy was due in part to the distinct advantages that nature preserves on the British Home Islands offered, in that they were uniquely situated for aligning the varied interests of post-war politics with the shifting epistemologies of British Ecology. Alcayna-Stevens (2016) study of primatologists in Africa is notable here as well. To make knowledge in the remote Congo, she tells us researchers first had to acquire the necessary competencies from the unique rainforest around them. Her work is an intriguing departure because it not only highlights the role of geographic location in the production of science, it suggests the physical environment plays a role in the transmission of knowledge that we do not yet adequately recognize.

The material structures of scientific-knowledge have not been ignored either. Rose-Greenland (2013) echoes the architectures of knowledge described by Galison (1997: 785) in her discussions of how different field-sites reproduce the epistemic and social distinctions of particular institutions, as well as archeology more generally. And in their effort towards materializing care, social studies of medicine have increasingly brought the built-environment into sharper focus. For example, Bartram (2020) shows how the particular material arrangements of medical simulation labs help resolve the tensions between the ethical and practical concerns of teaching in hospital settings with the pedological needs of students. Furthermore, Gardner and Williams (2015) depict a highly materialized medical-gaze in their descriptions of how the built-environment is used to make the bodies of patients more legible in the production of diagnoses. Their work expands on the ideas of Foucault (1970), but also raises interesting questions about the composition of knowledge, and the capacity of the built-environment to order and stabilize situated actions (Suchman 1987).

Finally, there have been notable developments regarding the varied meanings attached to sites of practice as well. For instance, Skyrdstrup (2016) argues that social studies of science should take the aesthetics of laboratories and other sites more seriously, as they are more than distinct faces and façades of credibility (Henke and Gieryn 2007). Drawing upon his study of an Arctic field-site, he describes how the aesthetics of a domed-camp and rectangular lab built-in ideals and aspirations that had a measurable influence on the form of both science and domestic-life at his site. Similarly, Rose-Greenland describes how different work-areas and field-sites carried varying degrees of prestige in her observations of archeologists, and that these different levels of prestige remained remarkably consistent even when evidence suggested lesser or more prestige was warranted. Lastly, Garforth and Stokelova (2012) describe how the othering of spaces outside the predominate and normative sites of science, marginalizes the knowledge which emerges and resides in those spaces. Their work draws attention to new sites of study, but also raises critical questions about how social studies of science reproduce spatial and other asymmetries in science-policy.

Those following Henke and Gieryn have made considerable contributions, but there remain a number of matters in need of further examination. For instance, sites of practice are too often described too rigidly. This is partly an artifact of methodology, but the consequence is that the structuring capacity for sites of practice is overly reductive, leaving questions about how things unravel largely unexplored. The material arrangement at sites of practice have been similarly treated in their descriptions. The built-environment is largely described in deterministic language because our conceptions of the physical world lack nuance, but in practice it is very much open to interpretation, and we do not yet adequately account for this flexibility in theories

of cooperative-action. Finally, the call for greater symmetry in social studies of science (Bloor 1991) have either left objects of study nowhere in our accounts of science, or gone too far, leaving us back where we started (Bloor 1999). What we still need are concepts and approaches for producing a theoretical middle-range (Merton 1968), but as of yet studies looking at sites of practice in science have tended to remain on familiar ground.

Why Angel Mounds?

As a case study Angel Mounds offered several advantages, the most crucial of which was access. What the site lacked in some respects, it more than compensated for in the fact that it was open to me in ways that would have been difficult if not impossible to gain elsewhere. That is, being a familiar face at the site is largely what made this project doable (Fujimura 1988). As a volunteer for more than a decade I had developed an important measure of trust between myself and those who controlled my access. And in practical terms this meant that I not only had access to the public parts of the site, but was also welcomed into the more private parts as well (Gieryn 1998). The same can be said for many of the discussions I had. Though not equally, most of the people who I talked with felt comfortable enough to share many of the things they found challenging or disliked, and which they might not have shared otherwise. Absent this degree of access, I would have undoubtedly produced a very different project, and one which forfeited the many advantages my personal history with the site afforded.

Though access was a critical reason for studying Angel Mounds, the site also offered something like a strongest case for examining how the practice of science is shaped by the places where it happens. Archeology not only happens at discreet sites; the sites of archeological practice are themselves both the subject and object of the knowledge archeologists labor to

produce. At Angel Mounds archeologists create new and sometimes dramatic theoretical chapters of the site, but they also smash, drill, scrape and tear away at the site itself, and in doing so transform the very thing which they seek to know and theorize. The two-sides of place in the practice of archeology suggest a study of Angel Mounds is doubly profitable, as archeologists seek to redefine the site in a new article, and at the same time reconfigure the soil and other things they encounter at the bottom of their dusty trenches. Logically then, if where science is done has significant consequences for the kind of science that gets made, surely a study of such a thoroughly place-centric discipline as archeology would provide opportunities to demonstrate how.

Finally, earlier studies of science and place have mostly involved laboratories - sterile, highly-ordered, and climate-controlled artificial spaces that represent only a fraction of the locations where science is done. Angel Mounds is dirty, messy, and exposed, not at all like the meticulous settings we associate with laboratory science. A hundred miles away from Angel Mounds archeologists enlist the aid of a lab to keep their hard-won facts in line, but at the back of Angel Mounds things are less certain, and much of what archeologists do involves imposing an ad hoc order on things. The more recent interest in science outside of the lab is encouraging, but these studies have largely focused on the boundaries between fields and labs (Kohler 2002), problematizing the division between natural and artificial environments (Rozwadowski 1996; Sorrenson 1996; Adler 2014), and demonstrating how scientists use the divisions between lab and field to achieve their various aims (Gieryn 2006). A study of Angel Mounds promises to expand our growing understanding of the differences between sites, but it also promises to

identify more of the sociological consequences such places have for both science and society (Henke and Gieryn 2007).

Research Design

In many ways my study of Angel Mounds follows the form of existing ethnographies of science (Latour and Woolgar 1979), and offering many of the same advantages they enjoyed. First, observing science as it is being done acts as a counterbalance to much of what has been written and imagined about science, and that has subsequently proven inconsistent with what scientists actually do in the lab. Secondly, observing the activities of scientists in situ provides an alternative account to those which systematically misrepresent and obfuscate the events through which scientific knowledge is made (Medawar 1963). In particular, the lack of an autobiographical style in scientific accounts makes it nearly impossible to reconstruct the context from which scientific achievements emerge (Woolgar 1976). Lastly, ethnography allows for what Latour and Woolgar (1979) call an anthropological strangeness, which dissolves rather than encourages the exoticism and mystery associated with the concepts and terminology scientists make use of. As the anthropologist treats knowledge claims of other cultures skeptically, so too does the anthropologist of science reject the technical knowledge of scientists as the singular explanation for what is going on at a site. Moreover, an anthropological strangeness allows studies of science to travel as freely between technical and social considerations as the scientists and others being observed in these studies, a boundary which severely limited and confounded studies of science prior to the ethnographic turn.

My observations at Angel Mounds began with a class project in the Fall of 2009, and continued again between the years of 2010 and 2012. During these periods I deliberately limited

the amount of time I spent scribbling in notebooks while in the field, because I believed writing notes would have frequently shifted my attention away from the actions and discussions I was there to observe and analyze. On a few occasions I jotted down short notes or quotes from conversations using a word processing app on my phone similar to how Grazian (2003) used napkins in his study of Blues clubs in Chicago, but these moments typically consisted of little more than short phrases, and were written into more elaborate field-notes later. Combined with a curiosity that came from knowing almost nothing about archeology and museum-work at the start of the project, my focus on observations over note-taking while in the field proved immersive, and helped generate a regular stream of questions and ideas that were essential to expanding my understanding of how Angel Mounds shapes the actions and thoughts of those who practice science while at the site (Glaser and Strauss 1999).

In addition to field-notes, I also made use of digital photography throughout the project. I had initially considered photographs as merely an expedient and inexpensive aid to observation, but through the course of my study photography came to be an indispensable part of my approach. The use of a camera captured visual data to an exponentially greater degree than what I could have produced through written notes alone. Perhaps this is what Gieryn was getting at when he wrote that he is the victim of a discipline that uses statistics and words as a means to grasp a subject which often contains a visual register (Gieryn 2000: 483). Though I had initially underestimated the value of photography, I did not take the decision to use a camera in the field lightly. In certain context having a camera in hand can produce equal, if not greater distance as someone scribbling down notes. However, I was given some cover as a volunteer for the site, and it could hardly be called unusual to see people using a camera at a historic site. Lastly, the

use of a camera did not involve looking away from the activities I was observing to the same extent that writing notes demanded. In fact, using a camera added an unintentional participatory component, as it allowed for me to consider the framing of images in ways not dissimilar to that of the archeologists seeking the right arrangement of light and angles in their own photographs.

I spent most of my time at Angel Mounds observing and asking questions as things were happening. A greater focus on separate interviews would have no doubt yielded interesting information, but moving away from the action to talk things out was the opposite of what I was aiming to do, and when I needed more clarity I found it easy to address issues on the way back from the field, through the hallways of the museum, and at lunch and breaks where the matters were being discussed anyways. There were times where my discussions looked like formal interviews, if one ignores the fact that it was taking place at the top of an earthen mound, the edge of a mucky creek, or under a shady tree. In fact, I made great use of the walking-interview while at Angel Mounds, and found it generated rich data (Evans and Jones 2011), and was well-suited to the demands of my study. Moving through or standing in the spaces I was asking about brought something extra to the table as respondents were able to point to a particular spot or area as they spoke with me (Kusenbach 2003). Simply put, keeping my questions in the field provided an indexical form of communication that would not have been possible otherwise, and which my study of Angel Mounds undoubtedly benefited.

I also used historical and archival sources when available. In fact, one section of this monograph is almost entirely derived from the historical and archival sources gleaned throughout the duration of the project. Additionally, the project was bolstered by the fact that some Angel staff have a general interest in history and archives, and on slow days would sometimes seek out

a quiet spot with me to dig through old photos, memos, programming, correspondence, and many other forms of written materials. I would describe such moments as infrequent, but the number of times those brief escapes led to revelations about the history of Angel Mounds are of such significance they merit mentioning. Over time the continual drip of these historical tidbits accumulated, and before long I learned that an archeologist and philanthropist became close enough friends to correspond regularly, and on occasion have dinner together. Knowing this, and many other lost and hidden aspects about the early days of Angel Mounds indelibly shaped my understanding of the project, the questions and ideas that I raised, and my analysis in meaningful and significant ways.

Finally, I drew upon a trove of memories I gained through my long tenure as a volunteer at Angel Mounds. I did not become a volunteer to learn about Angel Mounds, but it happened anyways, and pretending my past experiences do not exist is impossible. I also believe it would be recklessly negligent, bordering on deceptive to exclude these experiences. The greatest advantage of having spent so much time at Angel Mounds is that it increased my understanding of the site longitudinally. Having been a volunteer for so long, I recognize how truly rare excavations occur at the site, and similarly, how commonplace it is to cut down trees and unclog toilets. Over the years I have come to know the annual, monthly, and weekly routines of life at Angel Mounds, and this knowledge helped me to identify moments when settled things had become less so. Having such a long tenure presents obvious questions regarding my objectivity, but I was attentive to this fact, and my background in social studies of science provided a thoroughly critical stance. In fact, the positions I take throughout this work illustrate the distance

which I maintained, as they are divergent not only from the perspective of those I observed and spoke with at Angel Mounds, but society more generally.

Chapter Outlines

In the work that follows I use three substantive chapters to provide empirical grounding for how Angel Mounds (the site) matters for the archeology that is practiced there. I begin with a socio-technical history which starts before Angel Mounds was officially recognized. In the early days of Indiana Archeology, Angel Mounds is one of many notable, but relatively unknown sites. I then trace the growing significance of Angel Mounds over a period of more than 200 years, making particular note of how it was at no point inevitable that the relative preservation, remarkable artifacts, and numerous large earthen mounds were enough to ensure that the site would become what it is today. On the contrary, people and chance played key roles in making Angel Mounds the preeminent archeological site that it is in Indiana. I later use the historical development of Angel Mounds to undermine reductive materialist explanations that would have us believe the importance of the site is found only in what archeologists discover. And then conclude the chapter with a discussion of how the varied interests which give Angel Mounds its substance are never assured and routinely dissolve. And yet the site remains, always remade, though never entirely from scratch as the work of Kuhn (1970) would suggest.

In the second chapter I use a series of scuffles between private and public spaces, and archeological and non-archeological spaces to describe how the more formal and normative uses and meanings of specific spaces at Angel Mounds give way to varying degrees at times. The spaces of Angel Mounds are never as easily inscribed (or as defined) as architects, staff, archeologists and others claim and hope, and to keep spaces usable they spend a good deal of

effort defining it, and ensuring their definition is sufficient to produce the cooperation of others. In the first scuffles I discuss how staff, archeologists, and others continually negotiate the division between private and public spaces. For staff and volunteers in need of spaces to prepare or archeologists in need of spaces to secure their collection of dirt, ricks, and seeds, the boundary between private and public spaces is one with great stakes, and they act accordingly. In the second scuffles I discuss how the difference between the archeological soil at the back of Angel Mounds and the regular dirt at the front is not as fixed as staff believe, and archeologists are quick to see archeology elsewhere. Staff are invested in the archeological success of the site, but not at the stake of everything else, and so the question of where archeology sits at Angel Mounds remains an open question in need of regular negotiation. I conclude the chapter with a discussion of how a good deal of previous studies do not fully account for the flexibility of space in everyday use, and that as a result our understanding for the sociological consequences of space are overly reductive and inadequate.

In the final chapter I use three events observed at the back of Angel Mounds to call for a more agnostic understanding of place in studies of science. In the first part Angel staff are enrolled into the task of preserving an archeologically friendly site, and as they cut grass, fell trees, and in some cases set the mounds ablaze they take part in a never-ending struggle to maintain archeological interests at the site. I then follow a group of archeologists as they seek to keep the location of themselves and many other things knowable. Though it seems counterintuitive, it is striking how easily things and people can become lost in the open-landscape of Angel Mounds, and to help ensure they have an idea of where things are, archeologists reach for high-tech lasers, expensive lenses, and other powerful tools. For my last

event, I jump down into the trenches with a group of archeologists in search of how they create order on the walls and floors of their excavations. Features, deposits, disturbances, migration, and levels are all scratched and perceived into the sides and floors of these giant holes, but their existence is not a given, and the archeologists at Angel Mounds hold nothing back in their relentless effort to keep it all together. I conclude the chapter with a discussion of how the agency of sites have been neglected in earlier studies of science and place, and that my study of Angel Mounds suggests that the sites where science happens are not as docile as sociologists and others assume, at least not until they are made that way.

For the conclusion, I draw upon preceding sections to discuss in greater detail how Angel Mounds the site matters for the archeology that gets practiced there. I begin by describing how a few large piles of dirt were transformed from little known to almost unavoidable. Over a period of nearly two hundred years with the aid of people and other resources the site congealed, and as a result became obligatory (Callon 1986) to the human agents who wanted to create, preserve, or make use of archeology in Indiana. I then describe how in a repeating process of everyday negotiations; the various spaces of Angel Mounds are redrawn and given new meanings. Through the accumulation of these micro-level interactions that make it all happen, a discipline, people, state, and history are remade and re-associated a few square feet at a time, and that the significance of sites of practice may lie less in the capacity to constrain action, than their capacity to coordinate action in an open and flexible manner. Lastly, I describe how the sites of scientific practice in studies of science should reflect the surprising and frequently resistant character I found at the back of Angel Mounds. In a reflective turn I discuss how studies of science are themselves part of the place-making process, and call for an approach that permits

places such as Angel Mounds greater agency in our accounts of scientific places. To do this I suggest a turn to the tools of fiction that allow places of science the opportunity to act-up in ways that the language of the natural and social sciences do not presently permit, and in doing so discard some of the conceptual tools rooted in social and natural realism.

CHAPTER 2

MOUNDS ON THE RISE: CONCEPTUALIZING THE WEIGHT OF KNOWLEDGE

Figure 3. Electrostatic Surveying of Mound G, Angel Mounds Photograph Collection

Across the street an archeology professor and a handful of students are busy dragging measuring-tapes over a large mound. The need to collect such basic measurements seems odd, because directly behind me similar earthworks have been measured, scraped, prodded, dug, and theorized for more than 75 years. The collection of earthworks behind me have a large museum, signs, and fencing dedicated to them, evidence that they are something people find interesting and of value. There is no museum, signage, or fencing for the mound across the street, and the relative absence of trees and recent appearance of archeologists are the only signs that it means anything to anyone at all. Sitting no more than a few feet between the lonely mound across the street and the celebrated ones behind me, the divergent histories of dirt are surprisingly stark.

Introduction

Angel Mounds is a major Pre-Columbian settlement situated along the Ohio River just east of the city of Evansville, and one of, if not the most important archeological sites in Indiana.

The most notable features of the site are its 12 artificially constructed earthen mounds, the largest of which is second in the United States only to Monks Mound at Cahokia near St Louis Missouri. The size, number, and preservation of the earthworks clearly distinguish Angel Mounds from many other sites, but its status is the result of more than the presence of a few large piles of dirt. The promotion of Angel Mounds involved people and ideas too, and any account which neglects them binds the biography of Angel Mounds in the trappings of materialist reductivism. In the socio-technical history (Bijker et al. 1987) which follows, I remain cautious about privileging either social or material realism, and endeavor to allow both the material and non-material qualities of Angel Mounds to translate (Latour 1983) the events which eventually gave form and stability to the site we know today.

As archeology in Indiana was growing up and striking out on its own, Angel Mounds remained a quiet family-farm along the banks of the Ohio River until it was officially excavated in 1939. There is little doubt that the presence of artifacts and large earthworks helped establish Angel Mounds as an important archeological site, but for a long time they were not much to get too worked-up about. An analysis which focuses too closely on material things while ignoring the great drama of humans shaping and reshaping their environment fails to explain the many twist and fortuitous turns found in the biography of Angel Mounds. As the lonely mound at the beginning illustrates, it takes more than a few large piles of dirt and some broken pottery to make an archeological big-shot. In an effort to better understand the development of Angel Mounds as a truth spot (Gieryn 2002), I add people, ideas, and practices to the dirt, pottery, and measurements typically found in archeological tales. In doing so, I describe a more heterogeneous and relational character for Angel Mounds (Hughes 1983; Callon 1986), one

where the creative and perilous efforts of the people who make the site real are not hidden behind overly materialist conjurings.

I begin by describing the early expansion of archeology in Indiana. As a fledgling discipline struggles to come of age, the people, ideas, and institutions which make things archeological are largely absent, and so Angel Mounds remains just another place with some interesting piles of dirt. I then describe the meteoric rise of Angel Mounds from relative unknown to archeological gem. Dirt, economic collapse, war, friendship, and circumstance all combine with numerous other factors to transform some curious bottomland into one of the most prolific sites for archeology in Indiana. And in the latest turn, I describe how legislative and other changes led to a greater emphasis on making people rather than making archeology at Angel Mounds. Through the use of buildings and other structures, archeologists and others would seek to make the public a more reliable ally in their efforts. I conclude with a discussion of how the varied interests which give Angel Mounds meaning and significance are never assured. At different points the interests which gave existence to Angel Mounds dissolved, and what was once certain became less so (Jacobs et al. 2006). And yet, the interests never entirely unraveled, but was continually realigned with new interests. Absent a better word, one could say that at different periods Angel Mounds (re)learned how to be a part of our world (Brand 1994).

Pre-Archeology

James Kellar describes the archeological situation in the early history of Indiana as mostly antiquarian, and lacking consistent institutional support (1983:13). He tells us that the only published work related to archeology in the state before 1827 was a result of the Ordinance of 1787 in which federal surveyors for the fledgling US government were charged with assessing

the development potential in the "unclaimed" lands of what would in 1816 become the state of Indiana. Kellar tells us that surveyors of the period recorded both natural and cultural features, and were specifically instructed to include "archeological sites and evidence of Indian utilization" in their reports (Kellar 1983:13). At this time archeology in Indiana was similar to what it was in many neighboring states, which is to say it was little more than treasure hunting and local lore. However, with the Robert Owen purchase of New Harmony in 1825, and his subsequent utopian project which sought to establish a scientific and socially conscious settlement along the banks of the Wabash River; archeology in Indiana would briefly leap ahead of neighboring states in search for answers about those who previously inhabited the region.

The purchase and founding of New Harmony in 1825 brought a number of well-educated people, what Donald Pitzer (1998) called a boat-load of knowledge, to an area where earlier settlements had concentrated owing in part to the confluence of the Wabash and Ohio rivers. Among the many enlightened citizens of New Harmony was the French naturalist and artist Charles Alexander Lesueur. After moving to New Harmony Lesueur became interested in prior habitation of the area, and his training as a scientist and intellectual would lead him to approach his investigations in a manner that would distinguish his work from most of his contemporaries. Glenn Black, the archeologist most closely associated with the development of Angel Mounds, described the work of Lesueur as near that of modern archeology:

> …the important thing about Lesueur's work is that he excavated correctly! [sic] He kept notes and made sketches. He recognized important interior features. He made mineralogical identification of the stones used by the aborigines for artifact fabrication. He attempted to place these lithic materials in their proper time perspective by assigning them to geological levels from which they had been quarried. He attempted to make comparisons and interpretations from the crania and other skeletal parts which he found or were made available to him. (Black 1967:52-53)

Lesueur lived at New Harmony through the years 1825-1837, and during that period Josephine Elliot and Jane Johanson (1999) tell us he filled sketchbooks with the innumerable finds he discovered, and that Lesueur took research trips all throughout the area, sketching the people, places, and things he encountered along the way. Prince Maximilian of Weid-Neuweid who visited New Harmony in the years 1832-1833 is reported to say of Lesueur that “"He had explored the country in many directions, was acquainted with everything remarkable, collected and prepared all interesting objects" (Elliott and Johansen, p. 6). In light of what we know about Lesueur, it is notable that he never wrote of the larger and more complex earthworks approximately 25 miles to the southeast of New Harmony, and located on the banks of the Ohio River which many at that time would have passed by boat traveling to and from New Harmony. For an individual described by others as a meticulous and diligent recorder of things, the absence of what would eventually become Angel Mounds is telling. That is, it seems odd that Lesueur would fail to explore or mention a site that was both closer in proximity, and more physically imposing than any other he likely had knowledge about.

Unfortunately for archeology in Indiana the work of Lesueur would prove unsustainable, and in 1833 the artifacts excavated were shipped to Europe by Maximilian, Prince of Wied-Neuweid. Kellar tells us that despite being one of the earliest examples of its kind, the efforts at New Harmony during those early years would make no lasting contribution to the understanding of prehistory in Indiana, nor engender a continuing concern for the innumerable sites in the area or beyond (Kellar 1983). I am not completely convinced that the doldrums of archeology that Kellar describes is entirely accurate, as local newspapers continued to describe surprise finds and citizen digs in the years following the New Harmony excavations. Professional archeologists

might not have immediately benefited from the public buzz surrounding artifacts and burial grounds throughout the period, but such public interests in buried things would later help institutionalize archeology in Indiana, and begin cementing the relationship between archeology and the public that makes the discipline we know possible.

Archeology At-Large

James Kellar describes archeology in the years immediately following the work of Lesueur and others at New Harmony as essentially non-existent, and from the perspective of a professional archeologist such a claim is understandable. While many locations throughout Ohio became the focus of intense public interests and the sites of large excavations during the period, archeology in Indiana rarely consisted of more than accidental finds and local legends. Locations within Indiana were of equal size and complexity to those in Ohio, but went largely ignored owing to the fact that Indiana lacked much of the financial and social support that archeology in Ohio enjoyed. The early survey by Ephraim Squier and Edward Davis *Ancient Monuments of the Mississippi Valley* (1848) notes only the earthworks in the county of Randolph on the eastern boundary of Indiana. Kellar (1983) suggest that the presence of more impressive sites in the nearby towns of Anderson and New Castle is proof that Squier and Davis were unaware of their existence, and that Indiana was unable to muster the means to identify sites of archeological value and interest at that time.

Following the work of Lesueur the contributions made to archeology within Indiana were by way of the Indiana Geological Survey founded in 1869. The identification and location of economically viable mineral resources was the primary purpose of the effort, but the individuals involved in the publication often had wide ranging interests, and routinely included details of

sites previously inhabited or used by earlier people. In 1875 Angel Mounds appears in a geological survey for the first time. The descriptions of Angel Mounds by John Collett were so inaccurate that Glenn Black later questioned whether Collett had actually visited the site in person, but his map represents a kind of historical birth for Angel Mounds as an archeologically significant site. The 1875 map of Vanderburgh County by Collett illustrates no less than four large mounds which he describes as extensive in the southwest corner of the county. Though a faulty report in many ways, his work is important because it would motivate the locally curious to seek out the site (Black 1967: 8-9), evidence that while archeology as a profession remained a distant dream, the necessary social interests that makes institutionalization possible was present and energetic well before archeology was internally funded in Indiana.

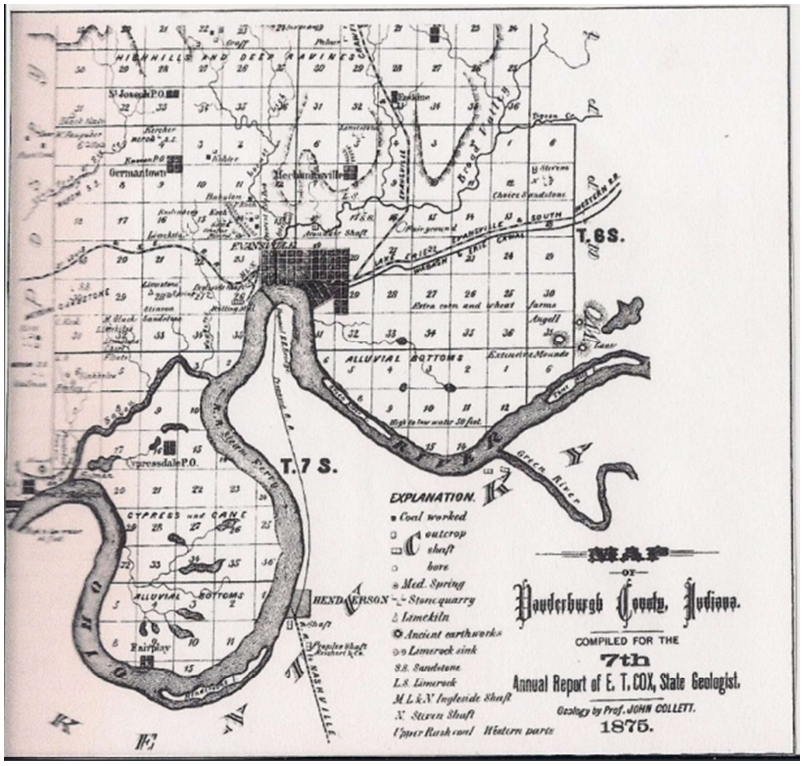

Figure 4. 1875 Collett map of Vanderburgh County (Black 1947)

Despite the relative lack of institutional support, there were a small number of externally funded excavations that took place in Indiana before 1928. In what is today Sullivan County, Frederick Putnam, the director of the Peabody Museum of American Archaeology and Ethnology, excavated a fortified site situated along the banks of the Wabash River. Two reports on what is known as the Merom Site were subsequently published in 1871 and 1872, and with them Indiana garnered some degree of national recognition. In 1898 the Mouth of the Wabash site in Posey County was excavated by Warren K. Moorehead, an important figure not only in the history of North American archeology, but also the later establishment of Angel Mounds. The results of the Posey County excavations are described as significant and successful, and Moorehead reported that a substantial number of artifacts were collected. Though smaller in scale than those that would one day take place at Angel Mounds, these early excavations were for the period sophisticated and notable. However, the outside interest of figures such as Putnam and Moorehead was infrequent and unsustainable, and archeology in Indiana remained mostly isolated in county histories and geological surveys during this period.

There is little mention of Angel Mounds during the early history of archeology in Indiana. The site was surely known to locals, and after the publication of the report and map created by John Collett in 1875 it would have been knowable to a much larger audience. Yet, it is safe to presume that if Angel Mounds was known, it was only known as one notable place among many. Smaller and less complex sites experienced excavations across Indiana, a signal that during this period size and complexity did not alone produce much attention. For those inclined to attribute the current prominence of Angel Mounds to its material conditions alone, there is the troubling question of why it took so long for archeologists and others to become

interested in a place that would later be recognized as the second largest pre-Columbian site in all of North America. The fact that Angel Mounds was identified as a significant site for no less than 50 years before being excavated indicates that rather than the unavoidable consequence of artifacts and earthworks, the eventual prominence of Angel Mounds was the result of something more.

Institutionalization

In 1882 the Bureau of American Ethnology chose Cyrus Thomas to direct a massive archeological program for the purposes of determining the cultural and historical questions presented by the numerous mounds found throughout the eastern United States. At the time a profoundly racist theory suggested that all the mounds were constructed by a more culturally sophisticated people before being replaced later by the culturally inferior native peoples Europeans encountered (Silverberg 1986). The theory was always controversial, but it remained persistent, and a steadily congealing archeological community increasingly called for research which could settle the matter once and for all. Information from publications and personal sources were sent to Washington D.C., and individuals were instructed to do surveys and conduct excavations throughout the eastern United States. James Kellar describes the project as being burdened by suspicion of Federal programs, but tells us that ultimately the venture amassed a large collection of materials (Kellar 1983). The publication of the *Catalogue of Prehistoric Works East of the Rocky Mountains* in 1891 was one of the primary publications to emerge from the massive federal program, and for the first time compiled many of the prominent sites across Indiana (including Angel Mounds) which had up to that point existed only in smaller local publications.

In 1918 archeology began to increasingly organize at the national and state levels. In light of the fragmented character of archeology in the United States, the National Research Council (NRC) instituted deliberate efforts to bring about the creation of state level programs in archeology. The programs put into place by the NRC were intended to advance the assessing of local sites and resources, create programmatic advice on the assessing process, and sponsor regional level conferences to facilitate communication and collaboration among leaders in archeology (Kellar 1983). The efforts on the part of the NRC resulted in greater organization at both the state and national levels, and as a result several groups within Indiana soon began engaging in cooperative archeological projects with other institutions and organizations. In 1926 the Indiana Historical Society would further add to the institutionalization of archeology in Indiana by establishing an archeological section for the first time. The representatives for the section soon found themselves attending and participating in regional-level meetings, reviewing the programs of other states and institutions, and assisting in the gaining of financial support for archeological research in Indiana (Kellar 1983).

Entering the 1920s archeology in Indiana began benefiting from the organization and expansion at both the federal and state levels. As a result, the first internally supported excavation in Indiana was undertaken at the Albee Mound in Sullivan County in the year 1926 and again in 1927. The work was directed by J. Arthur MacLean, director of the John Herron Art Institute, and supported by the Division of Geology in the Indiana Department of Conservation, the Indiana Historical Society, the Indiana Historical Bureau, as well as private contributions (Kellar 1983). Similarly sized projects were also conducted in the Whitewater Valley located in southeastern Indiana, as well as Hamilton, Marion, Morgan, and Porter counties. Throughout the

1920's and 1930's the institutionalization of archeology in Indiana solidified, and the hive of activity had the effect of further arousing public interests and drumming up support for future projects. In the hundred years since the work of Lesueur, archeology in Indiana began to morph into something near the institutionally supported discipline we recognize today. There were no university programs within the state to train archeologists before the 1960's, and the state lacked a permanent full-time archeologist until Glenn Black was appointed a position in 1931 with the Indiana Historical Society, but archeology in Indiana had in significant ways become a fully-fledged discipline by the end of the 1920's.

By the start of the 1930's archeology had established itself as a permanent and active discipline in the state. The Indiana Historical Bureau would fund county surveys until 1957, and publish the results in the *Indiana History Bulletin* or in special reports. The Indiana Historical Society funded most of the archeological activity in the state at this time, particularly in regards to excavations. In 1934 and 1935 the I.H.S. would fund the Nowlin Mound excavation, a large tumuli (burial mound) located in southeast Indiana in Dearborn County. This excavation was an important turning point in American Archeology as it had been common practice up to this point to focus primarily on burials and artifact association. The Nowlin Mound excavation, which Glenn Black, a prominent figure in the story of Angel Mounds directed, would deviate from this practice documenting the complex mound structure and construction so completely that Kellar (1983) later wrote, "there is probably no more precise description of mound architectonics in print" (Kellar 1983:19). Around the same time E. Y. Guernsey would conduct excavations funded by I.H.S. and Eli Lilly near the Ohio Falls near Jeffersonville and New Albany Indiana just across river from the city of Louisville, and beginning in 1937 I.H.S. would publish the

Prehistory Research Series, a publication reserved for anthropological monographs relevant to Indiana.

The journey towards institutionalization for archeology in Indiana would take longer, and at times face more uncertainty than archeology in states like Ohio, but in time archeology in Indiana would surpass most of its neighbors. There is however one conspicuous absence, particularly given that this is a story of how Angel Mounds came to be a preeminent archeological site within Indiana. In the more than 100 years covered so far Angel Mounds rarely makes an appearance. For a site recognized today as one of the largest and most complex in all of North America it is puzzling that the site avoided serious archeological attention until 1939, while sites all over Indiana were surveyed and excavated. The relative obscurity of Angel Mounds is not that surprising during those periods where archeology in Indiana was a less organized and a more localized affair, but archeologists had identified and described the Angel site more than 50 years before it was excavated, and all the while excavations took place nearby. During this period, in which archeology had become increasingly institutionalized in Indiana, it is evident that size and complexity were again not enough to get archeologists to come sniffing around.

Birth of an Archeological Site

Following the Treaty of Vincennes in 1804 the location now known as Angel Mounds was ceded to the United States. Shortly after on December 14th of 1805 a group of men using axes, compass, and Jacob staffs reached what is today the edge of the Angel Mounds property in an effort to establish Congressional townships in the newly forming state of Indiana. The United States deputy surveyor Jacob Fowler was the individual leading the group of hardy men hacking

and measuring their way westward that day. He was one of many surveyors contracted to establish and mark the corners of 1-mile sections, and then to divide them into quarter-mile sections. As part of their contract surveyors were required to record all rivers, creeks, and streams they encountered, and to identify any potential resources such as timber, stone, coal, and salt. More relevant for our purposes here however, the surveyors were also instructed to list any uncommon natural of artificial productions such as fossils and prehistoric remains.

On Saturday December 14th of 1805 Jacob Fowler is uneventfully making his way west when at 73 chains (4,418 feet) from the start of section 32 he describes a mound of earth located 70 links (46 feet) north of the westward line his survey team is following. Fowler goes on to list the mound of earth as approximately 25 feet in height and 198 feet in diameter. It is believed that the mound Fowler describes in his field-log is today Mound G (the lonely mound across the street mentioned at the beginning). Fowler was certainly not the first person of European descent to see the mound. The area was hunted thoroughly, military traffic had ran along the Ohio River since the time of the earliest French explorers, and a trail or trace existed just north of the site near what is today Highway 62. Fowler was however the first to identify and record the location of the mound he encountered, and in doing so provides the first confirmed record of what will one day become one of the most intensively studied archeological sites in Indiana.

Nearly 70 years after Fowler's survey, a second team of surveyors would make their way through the area. This second survey was geological in form, and was led by a man named John Collett. Like many geologists of his time Collett had developed a strong interest in prior peoples and settlements. The archeologist Glenn Black tells us that as a rule, geologists of that period often included a chapter on the existence of artifacts, remains, and earthworks in their county

reports, and that such matters were more often than not recorded accurately (Black 1967). The report produced by Collett included such information, but there is some question of whether he actually visited and observed the mounds at the Angel site himself, as his report includes several inaccuracies that seem unlikely to be made by someone who visited the site. That said, the importance of the second survey is not so much what Collett got wrong, but the map he made identifying the location of Angel Mounds, and his belief that the numerous mounds were part of an extensive set of related earthworks.

A year after the report by Collett a local Evansville physician Dr. Floyd Stinson visited what would become Angel Mounds, and his findings were later published by the Smithsonian Institution in the *Annual Report* for 1881. In the report Stinson would do much to correct the inaccuracies of Collett by accurately describing the position and size of several mounds, as well as the presence of what he called altars, burial grounds, and lines of earthworks. Archeologists would take issue with the use of descriptors like altar and burial grounds, and nobody can be sure exactly what Stinson meant by inner, middle, and outer lines, but tombs were later excavated, and archeologists believe Stinson had attempted to describe the remains of the bastioned-wall archeologists tell us once surrounded the site (Black 1967). Though Stinson might have exaggerated his findings, and was unaware of the fact that the prior inhabitants of the site buried their dead throughout the settlement rather than in designated areas, his report remains one of the most important early accounts of Angel Mounds.

A few years after the report by Stinson, an article titled *Pre-historic Race in Indiana* by S.S. Gorby appeared in the Indiana Geological Report of 1886. In the article Gorby writes of the location:

> The discoveries of Dr. Stinson I consider of very great importance. Here are works of remarkable character and great extent, connected with which are extensive cemeteries, in which the dead have been placed in uniformly walled graves…I think that a thorough examination of the works would reveal much of interest to the scientific world. (1887:307)

If the physical descriptions of the earthworks present at Angel Mounds recorded in the published reports of both Collett and Stinson were not enough to attract the curiosity of archeologists, Gorby's article surely made clear to all who read it that the site was unique and of a special quality. In the years following this article there would be at least three additional reports detailing the earthworks at Angel Mounds. The first was by Cyrus Thomas, who would visit Angel Mounds personally sometime before 1890 and devote considerable space to a detailed description of the site in his monograph *Report on the Mound Explorations* published in the *Twelfth Annual Report* of the U.S. Bureau of Ethnology in 1890-91. Up to the time of his writing Thomas would produce the most complete of all the reports that had been made of Angel Mounds, and he included several detailed sketches of both the site and earthworks present. Later, at the Twelfth Annual Meeting of the Indiana Academy of Science in 1896, A. H. Purdue would present a paper titled *Some Mounds of Vanderburgh County* which corrected the mistaken belief by Thomas that the western boundary of the site was more east than the boundary archeologists use today.

Finally, in 1937 the Indiana Historical Society published *Prehistoric Antiquities of Indiana* by industrialist Eli Lilly. The large work by Lilly was a survey of the many archeologically significant sites known across Indiana at that time. Angel Mounds was included in the collection, which was both known and familiar to Lilly as he had visited the site in 1931, and again in 1935. In general Lilly duplicated what had been written or said previously, but he

would add mound G (the lonely mound across the street) to the map of Angel, as well as descriptions of the material culture present at the site. From 1805 to 1881 Angel Mounds had existed as a site of archeological interest, but the location was little more than a few notations made by surveyors on their way through the area. The size and number of the mounds were measured, yet alone such knowledge was insufficient to garner the sustained interests of archeology to the site despite the existence of excavations elsewhere in the state. Instead it was the report by Stinson in 1881 which began the interest in Angel Mounds as an archeological site, a correlation which suggest that archeological sites are made prominent as much through the journals, imaginings, and methods of archeologists (amateurs and professional), as they are the dirt, shards, and deposits archeologists create stories from.

Figure 5. Eli Lilly photograph of Warren K. Moorehead and Glenn A. Black on Mound A (1931), Angel Mounds Photograph Collection

As 1939 approached the Angel site had garnered serious attention by well-known and influential archeologists, all of whom agreed to some degree that Angel Mounds was a remarkable archeological site. The failure to excavate at this late date was not purely because

archeologists had not yet determined the earthworks and artifacts present at Angel mounds to be extraordinary, but was at least partly a matter of access given the limited capacity to obtain properties of interest. Eli Lilly had led efforts to have Indiana purchase Angel Mounds since his earliest visit to the site in 1931, as did the nationally recognized archeologist Dr. Warren K. Moorehead who accompanied Lilly and Glenn Black to the Angel site during the 1931 visit, and who urged in conversation and by letter that the site be preserved for both its research potential, and as a means to educate the public about the past (Kellar 1983).

The call by Moorehead and Lilly for the State of Indiana to pick up the tab for purchasing archeologically significant sites was an early example of moves where archeology would ally itself with the State in the name of public interest, a development which would become more pressing in later years as archeology in Indiana outgrew its philanthropic roots and support structure. It also reflected the late 18th and early 19th century archeological interest in sites as a public, as well as a scientific good. The early efforts by Moorehead and Lilly to persuade the State of Indiana to purchase Angel Mounds ultimately failed, and in 1938 Lilly began negotiating the purchase of Angel Mounds on behalf of the Indiana Historical Society. The Angel site was eventually purchased in November of 1938 for $63,000, and soon thereafter, Glenn Black would move into a small house at the front of the property, and begin an association between him and the site that would span more than 26 years.

In the period between 1805 and 1938 Angel Mounds had transformed from a few notes in a surveyor's report to a nationally recognized archeological site of importance. The size and number of the mounds present at Angel Mounds had been known and recorded as early as 1805, yet alone these details proved inadequate to garner the kind of interests, expertise, infrastructure,

and resources required to raise the site to the position it would eventually occupy. To become more than a collection of measurements, Angel Mounds had to be given greater significance. Stretching heights and expansive diameters meant very little in the early history of Angel Mounds. Instead it was the inclusion of those measurements into the sketches and enthusiastic reports of the curious and scientifically literate that proved most decisive in sustaining the interests that would see the appreciation of Angel Mounds grow, and ultimately secure protection through its purchase. To better understand what Angel Mounds is, and how it got that way, the material and the social components of the site must remain tightly bundled. No matter how high dirt is piled it is not archeologically significant without archeologists, their methods, their theories, and resources. In the end, the story of Angel Mounds illustrates that the elements which comprise sites of science are co-constitutive.

Assembling Prominence

Perhaps the event that shaped Angel Mounds more than any other was the granting and use of relief-labor provided by the Works Progress Administration (WPA) between April of 1939 and May of 1942. A total of 277 men were employed at Angel Mounds through the 37-month span of the project in which 119,800 square feet would be excavated, or roughly 13,000 cubic feet of soil moved. In addition, 2,379,637 items were washed, classified, catalogued, and prepped for storage. For those whom these numbers have little meaning it would not be wrong to characterize the amount of material moved and processed at the Angel Mounds during the WPA years as colossal. As best I am aware the totality of all excavations to take place at Angel Mounds in the 75 years since the WPA equates to only a fraction of the materials excavated in the 3 years that WPA labor was used. What was for the average person at the time a life-line in

an economic downturn of unthinkable hardships, was for Angel Mounds an event that would help elevate the site to the zenith of archeology in Indiana, and forever change its history from one site among many, to a site above many.

In August of 1938 a proposal was submitted to the WPA for "the employment of needy persons to make archeological investigations of prehistoric earthworks, village sites, and burial grounds throughout the State of Indiana" (Black 1967:20). It seems the project was worded to make use of WPA labor elsewhere in the event that negotiations for the Angel property were unsuccessful, but in the end all WPA labor would be assigned to the Angel project. 20 WPA laborers reported for work on the morning of April 27, 1939, of which a small contingency led by the project supervisor Merrill G. Grothe began the initial survey of the site, while the remainder of the workforce removed fences, demolished several structures, and cut away undergrowth. Though only a part of the total preparation done at Angel Mounds, WPA laborers would raze 8 structures, and remodel or construct 6 buildings including a laboratory. In addition, some 2,000 feet of fencing and 290 fenceposts were hauled away or burned, 410,000 square feet of driftwood and brush removed, and 4,983 acres of undergrowth cut away. The survey of the site was equally daunting in scale including among other things 13.5 miles of transit, 874 grid stakes driven and tagged, and 8.4 million square feet of area on the site contoured. So much prep work above ground might seem out of place for a discipline described as subterranean, but archeology cannot happen just anywhere, untouched land is far too wild to produce reliable archeological knowledge, and therefore the landscape itself must be shaped into a form capable of producing desirable results (Law 1987).

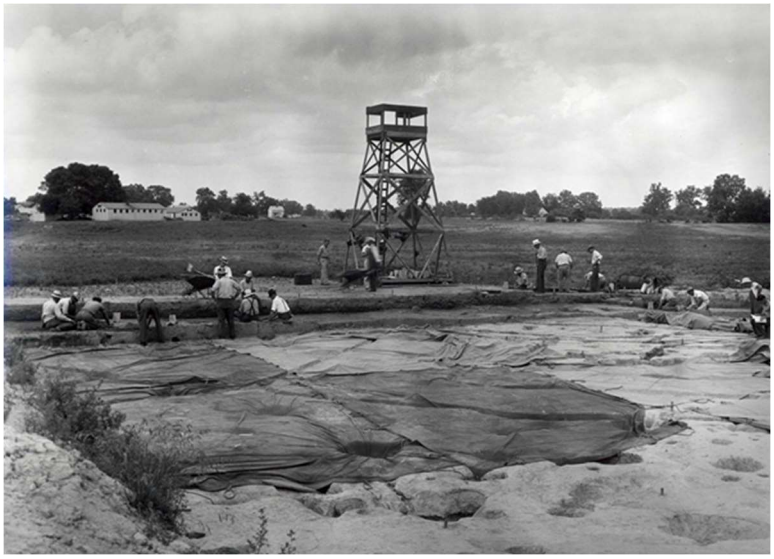

Figure 6. WPA Excavation of East Village, Angel Mounds Photograph Collection

In October of 1941 a proposal to continue the Angel project was submitted to the WPA, but on December 7th of that year the Japanese Empire attacked Pearl Harbor, and by May of 1942 the WPA period of Angel Mounds officially concluded (Black 1967). It would I believe be difficult to overstate how much the WPA years shaped the making of Angel Mounds. It is not so much what archeologists unearthed during the WPA period, as the scale in which things were unearthed. That is, the legacy of the WPA at Angel Mounds is not a matter of what was found during the period, as it is the immense transformation of the site itself. The size of the project would occupy the remainder of Glenn Black's life and career, as well as the greatest part of his two-volume collection *Angel Site: An Archaeological, Historical, and Ethnological Study* published posthumously in 1967. The cultural material collected during the WPA years exceeds 2.4 million artifacts, and over 300 burials, which contemporary archeologists currently use to produce knowledge about the diet and mortuary practices of those who lived at the site (Schurr and Powell 2005). Of the legacy of the WPA project at Angel Mounds a group of archeologists

wrote: “The WPA efforts can also provide testimony on agricultural practices, offer broad measures of hunting and gathering wild plants and animals, and answer a range of questions about the production and use of stone tools” (Baumann et al. 2011:38). And in recent years there have been lectures, exhibits, and “diggers” reunions to celebrate and call attention to the success of the WPA at Angel Mounds, particularly the men who participated in the program, but a full accounting of those faceless colleagues and fruitful years may never be fully understood.

Figure 7. Student Barracks at Angel Mounds Field-School, Angel Mounds Photograph Collection

In 1945 Glenn Black considered resuming field-work at Angel Mounds, but with no WPA labor there was little hope of doing so on the same scale as the years prior to the war. But the absence of a cheap workforce and the difficulties of teaching archeological methods in a classroom setting led Black to propose the idea of using the Angel site as a field-school:

> One might talk of cleavage planes, vertical profiles, horizontal floors, seriation studies, sherd types, and projectile forms until blue in the face without too much effect. To see a cleavage plane, to see a post hole or obscure house-wall trench take form before one’s eyes as a working floor is carefully troweled and cleaned, is a never-to-be-forgotten experience…Where else could the importance of botanical studies and the relation of vegetation to archeological features be so sharply related? Where else could the

> importance of aerial photography be so graphically pointed out? Where else could so large a body of material objects be so readily available for observation and study? Where else could complete photographic darkroom facilities be found? (Black 1967:27).

The concept of using Angel Mounds as an outdoor classroom quickly gained support at the Indiana Historical Society, and approval from Indiana University, and a pilot program was experimented with between 1945 and 1947. The program proved successful, and was soon expanded and offered on a more permanent basis. In 1947 Indiana University purchased 6 surplus army barracks, and by June of 1948 the field-school added a mess hall, two student barracks, and a well-house, further solidifying the program for the foreseeable future. By all accounts the field-school was very successful, with James Kellar describing it as one of the top two or three such programs in the United States at that time (Kellar 1983), and which is overwhelmingly spoken of in generous terms by Angel staff, archeologists, volunteers, and knowledgeable guests. During the 16-year period that the field-school operated more than 150 students participated, many of them later pursuing archeology further, or working in related fields (Kellar 1983). The field-school also helped develop at least two new non-evasive methodological approaches. The first using the varied distribution of contemporary plants to identify prior human activity, and the second was one of the first known cases where a magnetometer was used to detect disturbances below the surface, both of which have become common and indispensible tools to the practice of contemporary archeology.

Figure 8. First Field School (1945), Angel Mounds Photograph Collection

Distancing Archeology

The death of Black in 1964 would bring the field-school at Angel Mounds to an abrupt end, and would also have repercussions for Angel Mounds more generally. Due to Black's position at the Indiana Historical Society, Angel Mounds had served as the unofficial center for archeology in Indiana. During his tenure Black had accumulated more than 30 years of research materials, much of it irreplaceable records, collections, and equipment. Though it is still unclear how the decision came about, Kellar (1983) tells us that it was decided that the resources at Angel Mounds would be more useful if they were placed in a university setting. Archeologists would have understandably favored an idea which gave them direct control over the materials, and at the time archeology was finding increasing influence and support at a number of universities throughout the state. It is also likely that the Indiana Historic Society was concerned about the cost of securing the materials, the extent of which was only then coming to light. Above all however, a grant from Eli Lilly towards the construction of an archeology laboratory

and museum at Indiana University undoubtedly pushed the decision in the direction to remove the collection and other materials away from Angel Mounds.

Figure 9. Glenn A. Black Laboratory of Archaeology (2011)

Transformations to the practice of archeology after 1960 brought still more changes to Angel Mounds. As a number of federal and state laws mandated the preservation of historic sources, and made federal support subject to impact review. Archeologists were increasingly enticed away from classrooms and museums, and into the private sector where they soon found themselves on construction sites to help conserve and preserve historic resources. At Angel Mounds this had the effect of severely decreasing the amount of research undertaken at the site, and for several decades research was all but non-existent. Today field-research continues sporadically, but it has never exceeded projects lasting more than a few weeks. However, what

contemporary projects lack in duration they compensate for with a wide range of methods and techniques, and with multiple projects running concurrently throughout short research windows. On one particular day I observed a working-floor and profiled-walls in the East Village, coring on one of the western mounds, and magnetometry at the front of the property, an efficient and impressive amount of data collection by any standard. The amount of material collected, cleaned, and processed during the short summer projects is equally impressive, as the archeologists voraciously bag everything from large pottery shards to tiny grass seeds for transport back to their lab.

Figure 10. Screened materials, Angel Mounds Photograph Collection

In looking back at the decades since Black first began excavating at Angel Mounds, one could be tempted to think of the site as in decline, but I would suggest that it has merely changed. Today field-research at Angel Mounds is less frequent, and often contingent upon

highly competitive grants. However, knowledge about the site is produced at a far greater rate, and has expanded in breadth far beyond that of the WPA years, and before DNA, Isotopes, and magnetic waves had been trained to tell us stories of the past. Still, those early years of research were so foundational that when one talks of Angel Mounds, he or she is almost by necessity speaking about knowledge gained during the WPA years. Research at Angel Mounds seems likely to continue, at least in some measure because of the significant infrastructure and conceptual investment in the site make it rather indispensable for archeology. That is, the energy and resources that created Angel Mounds have given the place a socio-material weight that not unlike the gravity of a large star draws other bodies towards it, as questions asked and research conducted by archeologists frequently begin and end with Angel Mounds (Callon 1986).

Designing a Public

On the morning of October 19th 1972, the Angel Mounds Interpretive Center was publicly received by the Governor of Indiana Edgar D. Whitcomb. Among the many distinguished guests in attendance that day were Dr. James H. Kellar, director of the Glenn A. Black Laboratory of Archaeology at Indiana University, and Mr. Eli Lilly, a generous donor to the project, and long-time supporter and key figure in the advancement of archeology in Indiana. The Angel site had served to propel a fledgling group of archeological enthusiasts into one of the premier archeology programs in the country, and it was hoped by all those in attendance at the dedication ceremony, that their previous success would extend to the new Interpretive Center, and usher in a period of intense cooperation between archeology and the public.

Figure 11. James Kellar address at Interpretive Center Dedication (1972), Angel Mounds Photograph Collection

In his address architect H. Roll McLaughlin told the gathered crowd that the Interpretive Center at Angel Mounds was designed to serve as an educational tool to communicate the entire story of the site to visitors before they walked among the remains of earthworks and reconstructions at the rear of the property. Put another way, the Interpretive Center was part of a larger transition towards making people rather than archeology, and to fully realize the "potential impact upon the youth of Indiana and adult visitors" the Interpretive Center was to operate between 9:00am-5:00pm on weekdays and 1:00pm-5:00pm on Sundays. It was also hoped by those involved that the Interpretive Center would eventually include an on-site archeologist, and a Docent program to help staff during peak hours. In ways not unlike the techniques used by scientists to turn nature into a more agreeable form (Knorr Cetina 1981), the new Interpretive Center was intended to produce a more archeologically friendly public using a site which had only a few years prior served as the center for archeological research in the state.

From the choice of building materials to the distance of guided-tours, the Interpretive Center was designed to shape the bodies and minds of visitors into dependable allies for

archeology. The exterior steel-siding and concrete buttress foundation were not only low-maintenance materials, they were shaped to mimic the mounds and provide an architectural take on the most identifiable features of the property. A central corridor running between the front and rear entrances of the building provided control and access to the museum and archeological heart of the site. And the museum itself was designed to offer maximum flexibility with the expectation that exhibits would be routinely rotated and updated, and punctuated with a permanent pit sunk into the museum floor to simulate, in lieu of an actual excavation, the appearance of one. Lastly, additional spaces were allocated for a lecture room, staff offices, restrooms, and a large parking-lot that included acoustic ceilings, carpet, and mechanical systems providing water, plumbing, electric, lighting, and air-conditioning, all to better meet the needs and demands of a modern and mobile public.

Figure 12. Angel Mounds Interpretive Center (2012)

The Interpretive Center also included numerous exterior reconstructions to give physical form to the abstract ideas and notions that had until that time existed almost entirely as text in

monographs and journal articles. Among the reconstructions were three small structures representing a typical cluster of buildings which archeologists call houses. The structures were constructed over the footprints of where similar structures once stood, and were built of metal lath, cement, and plaster in a manner that simulates the wattle and daub construction of the original structures. Deviating from the overall low-cost design of the Interpretive Center, the roofs of the structures were thatched to authentically represent roof construction techniques of the Middle Mississippian period, likely with the intent of demonstrating the technique to the public. In addition, a round-house was built to better represent the range of construction types found at Angel Mounds, and to highlight the purification and other rituals which some believe the structures might have been associated.

The highpoints of the grounds-tour were the Temple and Chiefs mounds. At the top of the Temple Mound a large reconstruction was built in a manner similar to that of the other reconstructions on the site to mimic Mississippian construction techniques, but shockingly included museum space and air-conditioning which contemporary archeologists would find belligerent, as buried electric cables and modern construction techniques inevitably mixes soils across geological strata, and makes magnetic detection impossible to make sense of. The grounds-tour concluded with an impressive 20-foot-high reconstruction of the bastion-wall archeologists believe once surrounded and bisected the Angel site during the Mississippian occupation, and throughout the grounds-tour benches and interpretive signs provided opportunities for rest, and detailed information about the various earthworks and reconstructions visitors encountered along the way.

From dedication materials it is possible to discern at least two noticeable themes in the construction and design of the Interpretive Center. First, the designers had serious concerns about upkeep and cost, evident in many of the low-maintenance materials used in the construction, but also in the relatively small space allocated for staff and administration. If this building was going to work for archeology, the designers and other stake-holders involved intended it to be a low-cost affair. Secondly, the primary reason for constructing the Interpretive Center was a perception that the public was not as supportive of archeology as it could or should be. Through the power of mechanical air-conditioning, dioramas, sheltered-walks, and extended operating hours, designers clearly hoped to comfortably discipline (Foucault 1977) the public into a more reliable ally for archeology. And for a time, the effort worked, but society and its ideas are continually changing, and the Interpretive Center eventually came to be seen more as obstacle than asset. The interests which gave the Interpretive Center existence might have shaped generations into an archeologically receptive audience, but they did not do so indefinitely.

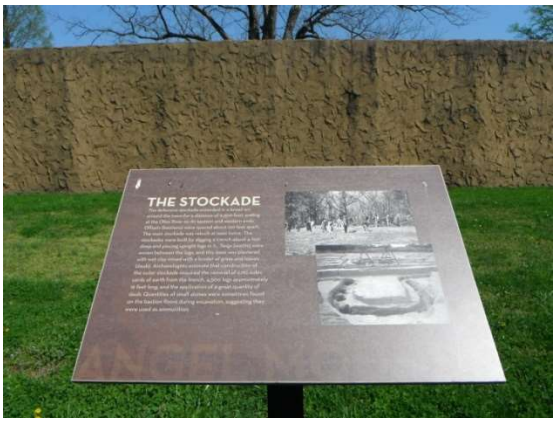

Figure 13. Outdoor interpretive sign for reconstructed stockade (2011)

A New Landscape

Today there is a discernable tension at Angel Mounds between telling the stories of Mississippians, and the efforts of Angel staff to increase the number of people who visit the site. In the decades that followed the construction of the Interpretive Center many of the on-site reconstructions fell into disrepair and were removed. The Temple built atop of Temple Mound became structurally suspect, and after being closed to the public for several years was eventually demolished and removed in 2004. The house structures have not had roofs for decades as thatching is a labor-intensive activity, and a skill not widely available or quickly acquired. The absence of a roof gives a spooky vibe to the old reconstructions, and raises immediate and predictable questions from school-children and visitors alike. Archeologists would of course prefer reconstructions remain a part of the past, but the decline and removal of these structures has more to do with the increasingly austere political landscape of Indiana than the wants of a few (mostly absent) academics.

Lacking qualitative measures for the success of historic sites, decision-makers in Indiana rely almost exclusively upon visitor numbers to determine the value of a site. In practice this use of purely quantitative metrics has the effect of shifting museums and historic sites away from the programming-you-need paradigm in favor of a programming-you-want approach. Additionally, the idea of a public good is something of political heresy in Indiana, and sites like Angel Mounds are evaluated mostly on what they bring to the local economy as attractions. As a result, Mississippians are only one of many programs and services the site offers to a public increasingly conceived of as consumers. To be sure, Mississippians remain a unique draw, and staff can be quite creative in connecting Mississippians to a wide-range of programs and

services, but staff are quick to tell you that they see Mississippians as one part of a larger strategy to get more visitors in the door. The move away from Mississippians has some advantages, providing a venue for smaller collections and other events with limited options, but it also divides already strained resources, and as many visitors and others have expressed, increases confusion by mixing the Mississippian stuff in with the rest.

If you go to Angel Mounds today, you can visit the museum and learn about Mississippians, but long gone are the heady ideas of an on-site archeologists and docent program guiding visitors on their trip through the past. At the front desk staff will offer you a simple map of the site (if they remember), but otherwise you are on your own to make of the site what you will. Moreover, on several days of the year you might find it difficult to concentrate and move about the site. Weekends can be particularly difficult, as Angel Mounds host a large number of events throughout the year that taxes the limited infrastructure of the site, creating choke-points around bathrooms, doorways, trails, hallways, and the parking-lot. And these events are only minimally (if at all) related to Mississippians or archeology. Private receptions are commonplace, but Angel Mounds also host a cross-country meet, art exhibits, and other large annual events which make quiet contemplation of the past all but impossible.

At the turn of the millennium the Interpretive Center was no longer seen as adequate by the state and other stake-holders, and as a result a large new addition and remodel of the museum were given approval and budgeting, with construction of the project concluding in 2002. The new addition included restrooms, classrooms, offices, a kitchen and a large open room which all told is considerably larger than the floor-space of the original building. In this latest iteration of Angel Mounds, Mississippian things are largely relegated to the older and smaller section of the

Interpretive Center, while the larger newer section is used for private receptions, art-shows, special exhibits, day-camps, lecture-series, and many other private and public events. The additional facilities and space make it easier for Angel staff to expand their programming into new areas, but it also further entrenches the newer programming-you-want paradigm into material form. Now built, the new addition prescribes some practices while discouraging others, and pushes back against change through conceptual frames which preempt actions, and the literal weight and strength of the materials used. For now, Angel Mounds is more or less set on a more consumer-based approach in its service to the community, but the history of Angel Mounds begs us to consider for how long?

Discussion

The history of Angel Mounds above demonstrates the value of a socio-technical approach to the study of where science happens. In the process of creating this history it became apparent that what made Angel Mounds archeologically significant had as much to do with people and other social things, as it did the artifacts and soil typically used to explain the prominence of a site. To borrow from Science and Technology Studies (STS), the making and character of Angel Mounds was, and is, heterogeneous (Callon and Law 1989), involving not simply the presence of artifacts and earthworks, but also the needs and wants of a fledgling discipline, economic conditions, federal laws, larger than life personalities, and unreliable publics. In the context of early Indiana Archeology, the artifacts and earthworks present at Angel Mounds proved insufficient to garner the sustained attention of archeologists enthusiastically digging all around; clearly there was something missing.

This history of Angel Mounds is however, more than an examination of the heterogeneity of the site; it also raises interesting questions about the structuring capacity of scientific places. Throughout the history of Angel Mounds there are periods in which the site develops along identifiable and durable trajectories, gaining a measure of autonomy and acting back on the people and things which made it. The case of Angel Mounds details how the accumulation of people, things, ideas, and time can produce a form of agency which defies our anthropocentric inclinations. For some, the things in our world remain durable due to a kind of technological-somnambulism (Winner 1986) or black boxes (Latour 1987), which leave us unaware or uninterested in the details of things so long as they work. The notion that Angel Mounds stabilizes and carries on because people view the site as adequate is helpful, but there is something unsatisfying in the preoccupation with the thoughts of people. Afterall, rickety structures, crowded spaces, and a leaky roof hardly avoid scrutiny, but such scrutiny is not always enough to do something about them.

In his history of electrical power systems, Hughes (1983) describes the momentum or inertia that resulted in the bringing together of copper wire, electrical power, politics, and people, which mirrors the biography of Angel Mounds in several ways. As time passed, Angel Mounds grew indispensable for archeologists in Indiana and elsewhere through an assemblage of soil, artifacts, people, techniques, theories, and careers. In the language of STS, Angel Mounds was translated into an obligatory point (Callon 1986) which people and other things were, and are, compelled to contend with to accomplish their goals and aims. In the ongoing discussion on why stable sites of practice remain in an era of increasing mobility, the ways in which sites continue to be obligatory is under-theorized. Henke and Gieyrn (2007) have noted how science has not yet

been freed of its terrestrial moorings, and that like the global economy, science has need for its own version of Global Cities (Sassen 2001) to centralize and gather the corporeal and material elements of science which stubbornly resists efforts to be transported and digitized.

That said, there is no certainty that the situation will not change. To leave the discussion here would suggest that science must be anchored in some manner, and ignore both the history of Angel Mounds and the transformative character of social life. STS has replaced the older social and natural realisms with a more relational ontology (Latour 1987), and in principle there is no social or material component which cannot be overcome with enough effort (Law and Callon 1989). In the past Angel Mounds was shaped in favor of archeological interests, but starting in the 1970s archeology moved-away, and in an effort to stay relevant Angel Mounds transitioned from enriching minds to entertaining them. As a result, the presence of Mississippians and archeology at Angel Mounds is now less dominant than in the past. While still a unique attraction for the site, Mississippian and archeological interests have given ground to new attractions and new interests. As a result, visitors at Angel Mounds now have more choices in what they attend to, not only in terms of more diverse attractions, but also in what they take-away from their excursions through the museum and grounds-tour. In past decades the focus and thoughts of visitors were given more direction, but today visitors are freer to roam and interpret the site as they wish, indelibly shaping life at Angel Mounds, but also raising critical questions about the changing role of science in society at-large.

The world is undoubtedly more on the move these days, but Angel Mounds is not going anywhere, at least not yet. The consumer-centric arrangement of politics, walls, visitors, artifacts, economics, and aspirations of which the site is now comprised represents a costly investment,

and something like a physicalized contract which engenders a degree of commitment. But for how long? Just as the knowledge-you-need paradigm was displaced by the knowledge-you-want paradigm, the biography of Angel Mounds is one punctuated with periods of change. Shifts in programming, a resistant public, a leaky roof, or a generous grant can lead to either trepidation or enthusiasm about the future, and create ruptures capable of tearing asunder once foundational features, and demonstrating in no uncertain terms that there are no guarantees. A study of Angel Mounds captures some measure of these dynamics, but there remains much work to do if we are to formulate a robust understanding of why sites of practice in science stick around in a world increasingly on the go.

CHAPTER 3

SMALL QUARRELS AND BENDABLE BOUNDARIES AT ANGEL MOUNDS

Latour (1988) tells us Pasteur and his microbes did not win over France from the weight of their actions alone, that they gained importance because France was turned into a place that allowed Pasteur and his microbes to thrive. He and his tiny bits of life were small, local, and weak by themselves, but through the amassing of laboratories, cows, hygienists, colonies, and others their influence on life in France swelled. The story of how Pasteur stitched together a system of people and things capable of acting together is certainly insightful, but Latour's account also seems a bit too neat and too unified, and I find myself curious about the moments when things did not always pan out so well. Traveling around Angel Mounds you encounter a mix of ideas, things, and people continually acting to produce a kind of socio-geographic epistemology that everyone can live with, but their efforts are not always as highly organized as Latour and others associated with Actor Network Theory (ANT) seem to suggest. Angel Mounds is understood and used in many different ways, some of them contradictory, and this makes for rather tenuous arrangements.

The tendency of ANT to overlook or exclude the messy parts of science-making is partly related to how ANT accounts typically situate themselves around a single builder. The tendency has obvious advantages, as it bounds a study to a manageable level. However, it also tends to describe closure too monochromatically, and glosses over much of the ambiguity that characterizes social-life. From the perspective of a single builder, their assemblages of humans

and non-humans appear to operate largely as intended, as Black-Boxes (Latour 1987), as things so well established that actors find themselves unable or unwilling to do things differently. To be sure, a lot of social-life is black-boxed, but alone the idea is rather impoverished, and mischaracterizes a great deal of therethinking and redoing we continually engage in. In principle ANT maintains that actors can and do change their minds, but the impression given is that things have settled once the protagonist in their accounts moves on, leaving sets of relations that some charge as over-formalized (Winner 2003), and enduring mostly because those involved do not bother enough to change them. For ANT the translations (Callon 1986) that bind networks appear to hold fast with an exceptionally high degree of fidelity, while also saying very little about how everyone might not be on the same page.

Addressing ANT directly, Star and Griesemer (1989) claim the coherence of translations upon which it relies cannot be understood from a single viewpoint. That scientific work is conducted by many different groups of actors, and the need to create shared understandings is both necessary and sometimes prove difficult to produce. Star and Griesemer (1989) describe science as a practice in which many of the actors involved come from different social worlds, and that social studies of science could benefit from examining more thoroughly the mutual ways of acting and thinking that allow for greater cooperation among different groups. Importantly, they emphasize that the effort to work together is not simply a matter of scientists convincing or coercing others to go along with them, but rather one in which each group of actors remains accountable to their own set of interests. That is, science, or at least the same science is not always the goal, there are often many. What Star and Griesemer propose is a more ecological analysis of science, and which they demonstrate through a case-study of a natural history

museum (Star and Griesemer (1989). In their study of a natural history museum they point to the importance of Boundary Objects in the cooperative infrastructure of science. They describe Boundary Objects as things plastic enough to adapt to particular circumstances, yet also robust enough to maintain meanings and actions between different groups. In their study, dead animals meant very different things for trappers, taxidermists, and scientists, but for a time everyone shared enough in common around the bodies of dead animals that they built a science from them.

In the case of Angel Mounds, the concept of Boundary Objects is instructive, describing well how different groups of users cooperate and coordinate with one another. When viewed as Boundary Objects, this spot here, and that spot there, are not always perfectly clear at Angel Mounds, but that is not always a liability. Angel Mounds mostly works, but things are not as harmonious as ANT and other social studies of science typically present. Using the concept of Boundary Objects I present a detailed examination of the tenuous form of solidarity (Durkheim1984) that not only prevents Angel Mounds from falling apart, but provide the weak-ties (Granovetter 1973) allow it to achieve greater importance and influence. The endurance of Angel Mounds is undoubtedly due in part to the weight of the powerful interests which have accumulated there over time, but like other things (De Laet and Mol 2000) the success of the site is also tied to its ability to bend and compromise for a range of different interests (Star and Griesemer 1989).

Two Boundaries

In this chapter I discuss two of the spatial divisions critical to the way archeology gets made at Angel Mounds. The first is the division between private and public spaces. Angel Mounds has been deliberately assembled to separate the many private aspects of archeology

from its public ones. Science has made use of witnessing for some time (Shapin and Shaffer 1985), and science is understood as observable by all in principle, even if that is rarely the case. However, a great deal of science depends upon private and forbidden spaces (Ophir and Shapen 1991). The openness of science must be balanced against the need to purify spaces of the wrong bodies, and threaten to contaminate the whole affair. For example, presentations need to be polished and well-rehearsed, as fumbling words and artifacts can undermine confidence. Archeology at Angel Mounds is an immense performance, and a great deal goes on behind the curtain to make the show upfront seamless and real for the audience; the distinction between private and public spaces help make it possible (Goffman 1959). The second division discusses the differences between the epistemic soil at the rear of Angel Mounds, and the regular dirt at the front. Archeologists have recently begun exploring beyond the back of the site, demonstrating (not always intentionally) that the enclosure of archeology at the rear of Angel Mounds is more of a conventional boundary than an absolute one. None the less, the boundary between the front and rear of the site is critical for balancing the many varied interests at the site, and transgressions of all types, archeological or otherwise are not taken lightly. To move archeology to the front of Angel Mounds the archeologists consider more than artifacts, and ultimately have to decide if archeology is worth the effort.

Negotiating Public and Private Spaces

Figure 14. Public area cordoned off for special event personnel. (2012)

The public spaces at Angel Mounds include most of the grounds; save for what is cordoned off for the Maintenance Building by a large chain-link fence on the east side of the property, though this area sometimes becomes public space with the recent reconstruction of the W.P.A. barracks. Two large grassy areas at the North and West of the property are also public spaces, as well as a large parking lot and shelter at the front of the site. The grassy areas are particularly popular with nearby runners, walkers, and dog-owners, but the annual planting of corn at the front of the property makes a large part of this space unusable for several months of the year. To the extreme west of Angel Mounds there is more public space in the form of a nature preserve, but this can only be accessed at the site through locking-gates at the rear of the property, and is typically entered from a public boat-ramp more than a mile west of the site. Lastly, the archeologically sensitive part of Angel Mounds is situated at the rear of the property, and it is often thought of as public space, but it is only accessible to the public through the Main

building during hours of operation, with some area and use restrictions, and at the cost of an entrance fee.

In the Interpretive Center there are more spaces open to the public, though much of it is not. The Main Building consists of a hub-like room containing a large and centrally located Visitors Desk and gift-shop. From the central hub two corridors lead to the original museum on the right, and the larger addition to the left. Visitors traveling to the right pass staff offices, closets, and an auditorium before reaching the high ceilings of the museum that contains a set of bathrooms and the entrance to the archeological heart of the site. All the doors except those leading to the rear are windowless with locks, so museum visitors typically cannot enter or peer into these spaces without permission, or while in the presence of Angel staff. Visitors traveling to the left of the hub pass a glass-walled room used for special exhibits before entering what staff call the Big Room. Along the left wall of the large room are another set of bathrooms, and to the right of the entrance a set of double doors containing the kitchen, with another room a few feet down from that used for storage, and a set of fire exits along the rear wall. The Big Room has several large classrooms and office space in the loft opposite the entrance, but the office space and classrooms are private and restricted areas with locking doors and a gated set of stairs.

In the paragraphs below I discuss three of the ways in which the boundaries between private and public spaces at Angel Mounds are breached and subsequently negotiated in the continual effort to make Angel Mounds work. In the first a long-time volunteer barges into the office of Angel staff who is hurrying to prepare for a program scheduled that morning. A frequently reliable ally for creating privacy the door to her office is temporarily derelict in its duties (Johnson 1988), and Angel staff find themselves unexpectedly caught between the

concerns of a volunteer and the imminent arrival of a large school group. In the second, archeologists invade a classroom in search of somewhere private to do their thing. Archeology is not always so present at Angel Mounds, but during peak periods such private and restricted spaces are frequently commandeered and converted into a temporary laboratory precisely because they offer seclusion. In the final example, demonstrators go outside in search of an appropriate place to engage their audiences. At big events visitor numbers climb rapidly, but so too does the demand for floor-space. As a result, programming, volunteers, and visitors overflow into what are normally areas too public for their needs. The result is not always satisfactory, but the arrangements work because those involved are invested in their success, and use what they have at hand to make the best of the situation.

Dealing with Interruptions

Figure 15. Angel Mound employee in her office. (2012)

It is just a little before 9:00 am in the Interpretive Center at Angel Mounds. A member of the Angel staff is in her office organizing an assortment of materials for her presentation later that morning. Papers of all types fill not only several large file cabinets, but cover the surface of two desks, the sides of her computer, other equipment, and the walls of her office. She arranges several objects she calls "artifacts" on the desk in front of her, gathering it all from several closets

and countless spaces between and behind the furniture and equipment in her office.

Suddenly the office of her door swings open and a large man burst through clearly infuriated about something. He calls the staff member by her first name, and speaks with an obvious familiarity, yet she appears irritated by the unannounced visit. The man is complaining about another volunteer, and the conversation is palpably tense. The staff member appears to listen to the complaint, but tells the volunteer several times that the matter is something that the two individuals will have to work out alone as she has no time to "make peace" that morning.

The man continued to plead his case for several minutes, but the staff member remained unmoved, and with pressed lips and a stern look repeated that she was too busy to deal with the matter. The result was the kind of deafening silence that seems to linger, and clearly dissatisfied the man retreats from her office. After he leaves the Angel staff member is visibly agitated, and finds it difficult to return to her preparations. She tells me she needs more time to calm her nerves, but the sounds of boisterous children can be heard echoing through the building, so she gathers the items in front of her and makes her way to the auditorium.

Of all the ways the boundary between private and public spaces at Angel Mounds become too porous, the most pernicious of these according to Angel staff are interruptions. Volunteers and other familiar faces are some of the worst offenders, who owing to their service to the site, or just a sense of informality feel entitled to freely walk into private offices and other private spaces. To be sure there are plenty of times that volunteers and others must move between these spaces in service to Angel Mounds, including the office spaces of staff, but such times are relatively few since volunteers mostly work with the public. Out of a sense of courtesy most volunteers mind the distinction between private and public spaces by calling ahead, setting appointments, or simply knocking on the door before entering, but a small number show less hesitancy, and enter the offices of staff for something relatively minor, chit-chat, or boredom. The result is often advantageous, because staff are sometimes looking for distraction, and overly formal arrangements can waste a lot of time. But such informality regularly creates scuffles over

access. Routine intrusions into the private office spaces are described by staff as a consistent problem, as they who find it over-burdensome to negotiate the matter so frequently.

The volunteers, postal workers, delivery drivers, and other familiar faces are some of the worst offenders, because they frequently circumvent many of the means through which Angel staff and others maintain private spaces at the site. The average visitor to Angel Mounds would rarely, if ever invite themselves into staff offices and other private spaces except in extraordinary circumstances, but for regulars to the site, entering such spaces without a formal invitation is understood as sometimes a positive and necessary thing. Locks help manage the issue, but many spaces like staff offices and the kitchen cannot always be locked, as it would be more disruptive than the problem it addresses. As a result, Angel staff are often compelled to make use of several other means to manage the boundary between private and public spaces, such as reminding, ignoring, subtle shaming, and in some cases, outright hostility. Volunteers and others rightly view themselves as a part of the operation of Angel Mounds, but sometimes fail to properly calculate (by the standards of staff), the need to maintain varying degrees of distinction between the private and public practices of archeology at Angel Mounds.

In the example mentioned above, an Angel staff member sought privacy to prepare for the school-group she had scheduled that morning. In her office archeology is chaotic, literally all over the place, but in the auditorium and other public spaces of Angel Mounds it is typically well-prepared and orderly. The boundary between private and public spaces is an important resource for managing the presentation of archeology at Angel Mounds. Just as slides, publications, and other techniques shroud and simplify the messiness of science elsewhere (Lynch 1985), classrooms and office-spaces do the same for Angel Mounds. Nevertheless, the

boundary between private and public is an achievement, and anything but a certainty. Visitors, guests, and others can ignore or misread customs and situations, doors and locks can fail, and when they do the private parts of science can become public (Gieryn 1998). The Angel staff recognizes the tentative character of privacy at Angel Mounds, and taking nothing for granted they double-check locks and ask others to screen calls and visitors, but their efforts are not always fully successful, and sometimes the more obscure aspects of archeology are carried into the public spaces of the site.

Borrowing and Making Privacy

Figure 16. Archeological material crowds classroom counter (2012)

Sitting inside one of the classrooms, which also serves as office space for some of the Angel staff I watch as a group of archeologists commandeer the room for storing hundreds of bags of rock, pottery shards, charcoal and other organic matter. The task is noisy, and filled with the sounds of grunting archeologists, the opening and moving of plastic bins, and the pounding of heavy plastic bags filled with hardened bits of clay and stone against the wooden shelves at the back of the room. Before long, papers, bags of materials, stacks of plastic bins, and other equipment and materials cover nearly every inch of floor, office furniture, and at times the archeologists themselves.

As things get noisier, the voices of the archeologists grow as one or another tells the rest where to put things. Eventually the episode becomes too much for a member of the Angel staff working at her desk, and she makes a break for some quiet in another part of the building. The archeologists do not seem to notice her exit, feverishly unloading bin after bin of sifted materials, (re)positioning heavy bags, grouping and labeling them all according to a system that catalogs where everything came from. Eventually the screensaver of the staff computer flickers off and the last vestiges of an office come to an end.

Inside the classroom turned laboratory, what had once been a quiet space for staff and a room for instructing children is now filled with archeologists and their great quantities of stuff. Just outside in the adjacent Big Room, school-aged children are listening, sometimes giggling, as they are told of the "corny" Mississippians by staff discussing the diet of those who once inhabited the site. Humor helps, but alone it fails to keep all eyes forward, and the children are repeatedly distracted by visitors and other staff, the equipment and other unfamiliar things currently within their reach, and the swirling whispers at the back of the room.

The borrowing of space is another way the divisions between private and public spaces at Angel Mounds become ambiguous. In the example above archeologists move into one of the classrooms, but it is only one of ways archeologists use private spaces in their effort to convert Angel Mounds into a temporary research facility during their brief visits. The Maintenance Shed, cordoned off from the rest of Angel Mounds by chain-link fence and locking-gates, serves as a quiet place to examine subterranean objects made visible with a magnetometer, discuss concerns and inconsistent findings, or simply to store equipment and materials. Archeologists are not the only ones to borrow private spaces at Angel Mounds. The Big Room and Kitchen are frequently rented for receptions, parties, and other gatherings, most of which have little or nothing to do with Angel Mounds, Mississippians, or archeology. At a time where public funding is becoming increasingly scarce, site-managers turn entrepreneurial to make up the shortfall from shrinking budgets and the declining rewards of fundraising. The arrangement is anything but ideal for

Angel staff that must not only clean up the next day, but remain diligent to ensure that what are normally private spaces remain public-ready.

In addition to keeping private spaces publically presentable, Angel staff must also be prepared for chance meetings in what are normally restricted areas. Guests often arrive early and linger longer than they should, and the entire staff is not always aware that visitors are using what are intended to be private spaces. The lack of dependably private space is an all too familiar irritation for Angel staff and others, which disrupts their routines, a place to collect and prepare themselves, as well as a general ability to create distance from an often demanding public. To be sure there are more worrisome issues to contend with at Angel Mounds, but the difficulties associated with the blurring between private and public through the borrowing of space is certainly a major concern if the number and passion of complaints are any measure. In the directives of distant supervisors, and the floor-plans of architects far-removed from the day-to-day operation of Angel Mounds, privacy takes place in the spaces designated off-limits to the public, but at the site it is not always so certain. Instead, privacy is something which Angel staff and others must work to accomplish, helped along with walls and doors, but contingent upon the contexts in which they find themselves (Garfinkel 2006).

To accommodate the frequent lack of privacy that results from the borrowing of space, Angel staff often resort to holding-up in their offices, running over to the Maintenance Shed, or searching for a shady patch of trees around the perimeter of the property. Such solutions, however temporary, are anything but completely adequate as staff and others regularly have folks walk or peer into their makeshift offices, break-rooms, and outdoor classrooms to ask for directions, facts about the site, or a sense of curiosity about the presence of so many children

gathered underneath a tree-line. Absent their usual means of privacy, Angel staff do the best they can to create some in the public spaces they sometimes find themselves inhabiting, cordoning off a corner here, or a bit of space there with a rope-line or other barriers, insistent signs, and verbal or written instructions given to visitors when they enter the site. In their most desperate moments, Angel staff and others resort to using distance and speed to quite literally run away from an unrelenting public, difficult volunteers, and others using all-terrain vehicles and two-way radios to stay available, but not too available.

Overflowing into Public Spaces

Figure 17. Retired anthropology professor volunteers as a presenter at special event (2012)

The weather is warm, perhaps too warm, and there is not much wind to speak of. A large event is taking place at Angel Mounds, and as a result hundreds of children and their teachers are running around inside the Main Building and throughout the grounds of the site. In front of me an Angel Mounds volunteer and former instructor at one of the nearby universities is presenting on several types of weaving used by American Indians, which she illustrates using both images and samples she has brought with her.

The 20 or so children in front of her give varying degrees of attention, which the volunteer seems less than totally happy with, but the situation improves significantly once the hands-on portion of the demonstration begins. A few minutes later most of the children are weaving cords with everything from

commercial yarn to leafy plants. As usual a few of the children are skirmishing over workspace and limited materials, but on the whole things look to be a success by the number of smiling faces and roiling laughter.

Located behind the Interpretive Center the group mostly avoids the sound of parking cars and other noises present at the front of the property, but not altogether immune the group is briefly interrupted when a visiting teacher walks up and asks the instructor where she can find a particular program. The request is simple, and takes only moments to address, but in that time the children become impatient and distracted, and it takes a concerted effort and bellowing voice for the instructor to reestablish order after the teacher has moved on.

Overflow is another common way in which the boundaries between private and public spaces overlap at Angel Mounds. The amount of visitors, particularly children who regularly come by the bus-load, occasionally exceeds the capacity of the classrooms and other spaces normally used for presentations within the Main Building. To accommodate unusually large crowds creative staff utilize the more public areas of the site such the Big Room, and when really pressed, temporary shelters, or the shade of a tree outside. The strategy generally pays off, but such extreme measures require a degree of flexibility and commitment, and often result in a less than ideal environment for speaking, demonstrations, and learning. The overflow of programs and activities into what are typically public spaces are viewed by Angel staff as an inconvenience, yet not as troublesome as interruptions and the borrowing of private spaces because large events tend to be shorter-lived, planned more in advance, and much less common. However, shifting what are typically private activities into the more public spaces of Angel Mounds can present some serious challenges, as audiences and demonstrators alike can be interrupted by a wandering visitor, severe weather, and more often than you might imagine, curious wildlife.

The blurring of boundaries due to overflow is not always from private to public, it is nearly as often the other way around. In the days and weeks before a big event it is not uncommon to find large displays, and exhibits packed into the more private spaces at Angel Mounds. The security needs of demonstrators can lead to unfamiliar equipment and materials finding a spot in many of the private spaces at the site, where Angel staff and others commonly gather for discussions, breaks, and preparation. None the less, it is the need for additional privacy in the more public spaces of the site that presents the greater challenge, as Angel staff and others can find themselves pushed into a hallway, the corner of a room, the rear of the property, and just about anywhere else those planning an event can find enough space to put them. At such times those leading discussions, demonstrating, or simply in need of a quiet place to work or rest succeed in their efforts only because they are willing to look past interruptions, uncomfortable temperatures, and limited space. Put differently, when Angel staff and others find themselves in a less than perfect location, they work not simply in, but also with the space to make the best of the situation.

The lack of dependably private spaces at Angel Mounds can limit the capacity of staff and others to highlight the site, its stories, and events in a manner they would prefer. In the example above a volunteer finds herself under a temporary shelter instructing a group of children. Angel staff involved in the planning of the event used familiar strategies such as signage, rope-lines, barriers, and a large sunshade to create a measure of privacy and shelter in the open-air at the back of the property, but they also placed the group in a quieter part of the property, and directed those traveling to and from other stations away from the group to further minimize distractions. Still, for all the efforts of those who planned the event, privacy was not

assured. Visitors can choose not to remain on the sidewalks and gravel foot-paths used to ease travel and direct crowds. Visitors can also ignore and bypass signs and barriers. The weather can become stormy and threatening, making it difficult to hear and concentrate, or to quickly seek safety. Privacy is not a given at Angel Mounds, and while it is more or less successfully accomplished at the site, breaches can and do happen as the different interests of users collide. Ultimately, distinguishing the private from the public parts of Angel Mounds has as much to do with a commitment to maintaining the differences, as it does the formal and established regimes present at the site.

Dividing Dirt

Figure 18. Sign near central Mound (2011)

One of the most critical divisions at Angels Mounds is the one placed between the archeologically sensitive soil at the rear of the property, and the ordinary dirt found everywhere else. For Angel staff, the archeological part of the site begins where the surrounding palisade-walls once stood. However, archeologists tend to find archeology anywhere they look, and see the enclosure of their work at the rear of the site as more a conventional arrangement than a

purely empirical one. Crucially, Angel staff are seen by archeologists as somewhat more permissive about what goes on at the back of the property, and understandably have some anxiety about the many decisions staff make in their absence. A high chain-link fence and marshy slough help control who and what moves into the archeologically sensitive part of the site, but archeologists do not always appear completely confident that the measures in place are sufficient. When present at Angel Mounds, archeologists often ask questions about what has transpired in their absence, conversations which can go on at some length, and sometimes lead them to compelling staff to different courses of action.

For the archeologists the division between the front and rear of Angel Mounds is critical, and there is a good deal at stake in regards to the credibility of their claims. This is not to say that the concerns archeologists have about what goes on at Angel Mounds is a matter of epistemology alone. To the contrary, mixed in with any appropriate place for creating knowledge is a multitude of varying interests that must be satisfied (Gieryn 2002b). However, archeologists are keenly aware of what is at risk if the quality of the soil they are so interested in were to go unattended and treated without concern for such academic matters. For Angel staff the consequences are somewhat less dramatic, but remain serious given that if transgressions at the back of Angel Mounds were to go too far, the primary reason for the site would be diminished, and along with it, the need for staff at the site. Given the situation both groups remain vigilant against potential intrusions and ambiguities that might threaten the existence of the site, but their different aims produce variances in both the meanings and practices the two groups attach to the site. In the everyday practice of making Angel Mounds differences between archeologists, Angel

staff, and others are frequent, and often prove surprisingly consequential in determining what goes where at the site.

In the following paragraphs I discuss two events that illustrate ways in which the activities of Angel staff, archeologists, and others diverge from one another, and how at times it becomes necessary to renegotiate what the dirt in different spots mean for everyone involved. In the first event, Angel staff see no need to be concerned about the dirt near where modern structures have been constructed, but archeologists see potential archeology there, and take great strides to keep the soil they are working with from wandering about. In the second event Angel staff attempt to burn what remains from a recent logging of a large wooded area at the back of Angel Mounds. Their effort to burn away the discarded material proves unsuccessful, but only later do Angel staff learn their failure was a blessing y that only narrowly avoided rendering a large area of the site illegible to magnetometry. Cooperative action across different groups of users is made possible at Angel Mounds in part because the meaning of the site is somewhat flexible, but this flexibility only works because some users make an effort to keep what goes on at the site within certain expectations.

Mingling Soil

Figure 19. Archeology students water screen collected soil (2012)

It is early morning at Angel Mounds and I am watching a few of the archeology students involved in the field-school cover the sloping ground between the maintenance shed and the slough with large sheets of plastic. The group is careful to overlap the large sheets in a manner similar to the way a roof is shingled so that water, soil, and other materials will not find their way underneath and seep into the ground below. Once the plastic is where they want it, the archeology students then begin driving wooden stakes into the ground, and fixing the outer edge of the plastic sheets to them in a perpendicular position, creating a plastic levee that runs along the lower edge of the structure.

Essentially the archeologists have built a large bathtub that prevents water, soil, and other materials from soaking into the ground, and potentially contaminating that part of the site with materials that could produce chronological inconsistencies. From the bottom of the makeshift structure the water drains from a single point into the slough, which itself flows into the Ohio River and downriver from Angel Mounds. The project takes the group of archeology students a couple of hours to complete, and the group cannot begin screening until given the green-light by one of the supervising archeologists.

Once given approval the archeology students place three of their screening devices made of wood and wire-mesh in the middle of the structure, and then run a separate garden-hose to each. As the screening devices are put into position and final preparations made, five-gallon buckets filled with excavated soil begin arriving, each topped with a sheet of paper stored inside a plastic bag identifying

> *where each bucket of soil originated. Everything now in place the archeology students begin screening the buckets of material, spraying water onto the piles of soil until nothing remains but the pieces of bone, stone, and plant too large to pass through the small holes of their simple wooden machines.*

Observing archeologists at work at the back of Angel Mounds can be a rather dull exercise. I have stood in one place for hours watching archeologists remove no more than an inch or two of soil from the bottom of a trench one handful at a time. To say that archeologists are a cautious bunch is not to say that they are more so than other scientists, but rather to draw attention to the paradox (Theseus) they confront in their work. In collecting the things they use to construct their stories about the past, archeologists necessarily eliminate that which they will later make claims about. That is, to get facts about a particular place and time out of the ground archeologists rearrange the soil and other materials they work with into something different. One of the challenges for archeologists working in the field is to convince others, that enough of the original thing is represented (they would say preserved), so that it may stand-in for the thing they destroyed. As a result, archeologists develop and use extensive techniques to create and mobilize the context which is removed as they work their way ever deeper into the ground. Identifying paperwork is issued for every bit of soil, drawings and photographs illustrate and suspend the existence of levels and features soon to perish under trowel and shovel, while measurements, logs, and other documentation describe the when, where, and how of it all.

Archeologists can be just as tedious and cautious when working above ground, and at Angel Mounds they are quick to challenge ideas and practices which might diminish or bring greater uncertainty to the condition of the soil their claims rely upon. In the example above the archeology students spared no time or expense to ensure that the work they were doing on the surface of the site would not find its way below ground. Large sheets of plastic, wooden stakes,

careful drainage, and the inspection of their work by supervisors added more work and expense to the already labor and time intensive task of screening. The precautions seem unnecessary given that the location has previously been disturbed due to the construction of the nearby Maintenance Shed, and more recently the reconstructed WPA barracks. The ground under the workstations the young archeologists assembled has been churned up before, and littered with foreign materials used in the concrete floor and foundations of the large structures built nearby. Still, the archeologists choose to keep the soil from the back of Angel Mounds from mingling with other parts of the site in an effort to prevent future questions. Archeologists are nothing if not diligent about keeping soil in its place.

On the other hand, the staff at Angel Mounds see little need to go through the extraordinary measures archeologists employ to keep soils from mixing at the site. Staff have little concern for dividing what is archeological and what is not, it is simply what lies at the back of the property, and decades of practice built upon the idea only further solidifies the boundary for them. Though there may be archeologically interesting aspects at the front of the site, they are not Mississippian, and so staff find the rigidity of archeologists as mostly unnecessary. In fact, one might charge the staff at Angel Mounds as being rather cavalier about mixing soils, through the educational programming at the site, and through activities such as cross-county and disc-golf, as well as routine construction and maintenance. The relative lack of concern for archeology over the entirety of the site by the staff at Angel Mounds frequently raises the eyebrows of archeologists, and in many cases questions often follow. However, while not always convenient, such occurrences are not a disadvantage. The flexibility and practices of negotiation built into the practices at the site are what allows Angel Mounds to be more than a few handfuls

of dirt interesting only to archeologists. In the hands of Angel staff, the site draws the necessary attention and investment of the public that makes contemporary archeology possible, and thus archeology could not be what it is without them.

Scorched Earth

Figure 20. Post-logged landscape (2013)

The scene before me is startling, a grove of trees once stood where now nothing remains except tree stumps, sawdust, and stacks of branches too small to mill. The landscape has an otherworldly appearance, and it is difficult to reconstruct in my mind the way things looked just days ago. I have been told of the damage tree roots cause to the archeology below, but I had not until this moment realized how intense the battle between trees and archeology had become.

A few moments later Angel staff try to burn the large stacks of branches in an attempt to quickly eliminate what remains, and avoid having to remove it all by hand. The group makes several attempts at burning the large piles of branches, but unlike the high grasses burned off the larger mounds annually, the stacks of branches do not easily build-up the heat necessary to burn, and their efforts result in little more than some scorching and blackening.

Later that evening Angel staff learn from archeologists that a fire concentrated enough to burn the large stacks of branches could reach temperatures capable of altering the magnetic composition of the soil below, and with it any future research using a magnetometer, and so their failed attempt was a blessing. In the weeks that follow removal by fire is abandoned, and staff resume the cleaning the back of the site by hand, a slow and labor intensive method, but one Angel staff

believe carries less risk and worth the effort to keep the soil at the back of Angel Mounds archeologically relevant.

Archeologists, Angel staff, and others recognize that the occasional quibbles over what can and cannot happen at the front of the Angel Mounds is to be expected, but at the back of Angel Mounds they typically speak of things as being more clear and certain for everyone involved. To some extent this is true. At the back of the Angel mounds things are a bit more prescribed and surveilled, but again there is considerable flexibility in the way staff and archeologists understand the site. Though more cautious while at the back of Angel Mounds, staff must work at the back of the site in a myriad of ways, and it would be impractical to discuss everything they do with archeologists before proceeding. As a result the actions of Angel staff are not always understood or judged positively by archeologists. In their attempt to burn the materials that remained after logging a large wooded area of the site for preservation purposes, the staff came near to altering the magnetic composition for that portion of the site in perpetuity. Needless to say the archeologists and staff alike were thankful that the materials failed to burn.

The event described above raises interesting questions about the influence of the archeologists at Angel Mounds. It is widely accepted, even formalized in documentation that archeologists determine what happens below ground, while the staff at Angel Mounds decide what to do above ground. This position is repeated frequently by archeologists and staff alike, but it fails to consider that the boundary is more flexible than this suggest, at least in practice. The happenings above and below ground at Angel Mounds rarely confine themselves to such distinctions, and both archeologists and staff work and make decisions that influence both strata. Again we see that the formal agreements between archeologists and Angel staff are important for making archeology, but much remains unsaid and undetermined, leaving considerable room

interpretation by both groups. Again it is this flexibility that allows Angel Mounds to be more than what a few archeologists make it, and thus it is the flexibility of the site more than the rigidity of earth and structure that make the site matter to society more broadly.

In the end then, the enduring influence, prestige, and importance of Angel Mounds is only partly attributable to the formalized and institutionalized practices that keep things from getting bogged-down and moving forward, but the influence of such practices and conventions on events at the site are limited. That is, there is still a great deal of discussion, negotiation, and interpretive flexibility at Angel Mounds, despite so many previous agreements. As archeologists, staff and others endeavor to satisfy their varied and sometimes conflicting needs, it is the flexibility of Angel Mounds that allows cooperation among them, and ultimately facilitates the broader success of the site beyond the horizons of archeology. Through staff, volunteers, donors, presenters, students, and others the site is given a wider existence, one that permeates communities, classrooms, and families across Indiana and beyond. If social studies of science are to take the places where science happens more seriously, it is imperative that we look as closely at how structures bend, as much as how they stand firm.

CHAPTER 4

WILD GROUND AGENCY AND ORDER AT AN ARCHEOLOGICAL FIELD SITE

Figure 21. Field school participants perform several functions in one unit (2012)

Making my way through the large garage doors of the Maintenance Shed I flip over a plastic bucket to use as a seat. Others do the same, or grab a spot on the bench, the bumper of the ATV, or retrieve a few folding chairs to use. Everyone is filthy, our hair, clothes, and shoes are stiff with different mixtures of sweat, dirt, and blood collected while wrenching facts (both archeological and sociological) from the back of Angel Mounds all day. Suddenly the boisterous sounds of overlapping conversations cease as the director gives his thanks and appreciation. Afterwards everyone is all smiles and cheers in a sense of accomplishment at having completed another week at the back of Angel Mounds making science.

Looking around the large room I see sunburned faces sharing tales of folly and foil, equal parts testament and catharsis to the challenge of doing archeology away from the lab. "If only I had known" one story goes, while another describes the "tricky trench" encountered earlier that day. Taking a moment to reflect I notice that one of my leather boots has a large rip, and the knuckles of my right-hand have cuts clotted with a sun-baked combination of blood and dirt. A week spent following archeologists around the back of Angel Mounds making science reveals two patterns, doing archeology hurts a lot more than I had imagined, and Angel Mounds (the site) is not always a compliant participant.

Making science at the back of Angel Mounds looks and feels very different from what ethnographies of laboratories have described in the past. The same could be said about Classic Athens (Sennett 1996), cloistered monasteries (Noble 1992), Gentlemen's Houses (Shapin and Schaffer 1985; Shapin 1988) and other sites associated with the production of scientific-knowledge. To be sure, there are important similarities between archeology in the field and archeology in the lab. In both the laboratory and the field, archeology in-the-making is contingent and locally dependent, but uncertainty might be more pronounced away from the lab given the high degree of standardization and systematic exclusion of nature which laboratories are known for (Latour and Woolgar 1979; Knorr Cetina 1981; Hacking 1983; Gieryn 2002). Archeology at Angel Mounds incorporates standardization into its practices, and nature is certainly not free from intervention and reconfiguration, but at the back of the Angel Mounds archeologists grapple with the environment in dramatically different ways than they do in their laboratory back in Bloomington.

While conducting excavations, the archeologists I followed spent most of their energy manipulating and moving soil around with hand-trowels and plastic buckets. Similarly, the excavations were done in the months of May and June when temperatures often climb into summer highs, which in the near treeless landscape of Angel Mounds can be punishing for the healthy, and dangerous for those who are not. Simply moving around the site can be difficult, as archeologists frequently stumble, sink, slide, and climb their way through the wilder portions of the property. To a sociologist steeped in ethnographies of climate-controlled laboratories, archeology at Angel Mounds is a bit of an adventure. Sweat-stretched clothing, deep sunburns, blisters, and bloody bandages are all too familiar to the folks who make archeology in the field,

but are mostly absent from archeology in the lab. Things are not all bad, but the enjoyment associated with fieldwork is largely retrospective, and well distanced from the physical demands of making facts from soil in situ.

At the back of Angel Mounds, I saw value in paying attention to the bodies and soil so integral to the practice of archeology in the field. Sweat, grime, pain, tears, and exhaustion were all metrics from which to not only contrast field-sites with laboratories, but to also press our understanding of scientific-places further. However, in the following discussion I do more than simply describe the relative discomfort and chaos of archeolog*y* in the field, I also insist that in the interaction between body and soil there is evidence that the places science inhabits have greater agency than we typically assign them. For its part a study of Angel Mounds hints at not only the variety of places from which scientific knowledge springs, but more importantly, identifies the clash between humans and landscape as the substance through which the site can be said to act-up, resist, surprise, and on occasion defeat those who would see it shaped into something else. At Angel Mounds archeologists and others toiled away to transform dirt into well-behaved facts (Latour 1999), but the numerous scratches, bruises, and injuries were all signs that the site sometimes gives as well as it gets.

To enliven Angel Mounds with greater agency could be seen as shifting too far towards natural realism, and away from the pay-dirt of social realism upon which so much of social studies of science have been paved. Similar moves of symmetry have been challenged forcefully in the past (Collins and Yearley 1992), but my aim here is more empirical than philosophical, and so I mostly avoid talk of networks and their intentions in favor of discreet human and non-human actors. In principle I do not reject the relational ontologies upon which the former is

grounded (Latour 1999b; Law 1999), but presently I am more concerned about more practical matters than philosophical. Moreover, I do not believe I must conform to epistemic extremes to avoid regressing back to overly deterministic forms of natural and social realism, and that it is possible to situate my work between the two positions with a measurable and meaningful return.

To produce this middle-ground, I use something not unlike personification to remain sufficiently constructivist towards the humans and non-humans in my account, and to extend the voice ethnographers seek to grant their informants to both humans and non-humans alike. For those who would charge me as cavalier for using the tools of fiction, on the whole I stay within the well-traveled terrain of earlier ethnographies, and deviate only where I seek to directly challenge notions that would assign Angel Mounds to mere backdrop (Gieryn and Henke 2007). Put simply, my violation of the established divide between humans and non-humans is intended to extend the sociological imagination (Mills 2000) to what I understand to be a larger cast of actors (Latour 1992), and to take a more agnostic position in the archeological drama that unfolds at the back of Angel Mounds.

In the discussion below, I use the concept of **struggle** to analytically theme three events where archeology at Angel Mounds not only looks different from laboratory science, but also provides insights into the lively character of the places where science happens. In the first struggle, absentee archeologists rely on the aid of Angel Mounds staff to preserve their interests at a place continually threatening to go wild. Order is the currency of science (Fujimura 1988; Fuchs 1993; Turnbull 1995), and despite appearances, Angel Mounds is a highly ordered place where the staff at Angel Mounds see it stays that way. In the second struggle I focus on the considerable energy archeologists expend to keep them, the soil under their feet, and countless

other things in place. Once disturbed by contemporary hands and tools, soil at Angel Mounds cannot remain archeological without the benefit of a meticulous Cartesian system to keep things where they are, and this task is surprisingly more uncertain than one might assume. In the third and final struggle, I describe a few of the ways archeologists at Angel Mounds turn dirt into stories of the past. Features, deposits, disturbances, migrations, and levels are all scratched and perceived into the sides and floors of archeological trenches, but their existence is not always sustainable or predictable. Greater durability and reliability are necessary, and the archeologists at Angel Mounds deploy an array of techniques to restrain piles of unruly dirt.

Preserving Archeology

Figure 22. Root-laden trench (2011)

As I looked down into the trench I giggled a little bit before the solemn looks of the archeologists forced me to turn my head and swallow my laughter. I hardly knew anything about archeology, but I knew enough to know that roots hanging out of the walls of the trench (seemingly everywhere) could not be a good thing. I had watched archeologists smooth the walls and floors of trenches for weeks, and I recognized immediately that such a large number of roots would make such an

effort very difficult. What I did not fully understand was how effectively these roots would thwart the efforts of the archeologists.

Though visibly discouraged, the youngest member of the group was not yet ready to concede, and jumps down into the trench and hacks away at some of the worst offenders. He quickly realizes the futility of his effort and shifts to scraping small areas on the sides of the trench with a trowel in the hopes of smoothing it some. His second effort appears to have been an equal waste of time judging by his demeanor, and resulted in little more than a crumbly pile of dirt on the floor of the trench. Eventually the most senior of the archeologists jumps down and takes a look for himself, but minus a poke or two with his finger in a few spots here and there he never indicates whether the tangle of roots in front of him means anything.

The mood is somber as the archeologists collect a few handfuls of soil from the walls of the incorrigible trench, as the chaos all around them prevents almost anything meaningful from being discerned. There had been a few other hiccups that week, but as far as I could gather the archeologists had seen mostly success. Now, at the bottom of a root-laden trench their disappointment is obvious. The location was strategically important in terms of what it could potentially say about the Mississippian occupation, but more importantly, a significant amount of time, effort, and resources were forfeited to clear and excavate a spot which ultimately yielded little towards their goals.

As you travel among the large earthen mounds, open plazas, and surrounding woods at Angel Mounds there is a sense that things have always been as they presently are. However, Angel Mounds is a place in constant motion; though the movement is not always in a register that humans are well-attuned. Less than 100 years ago Angel Mounds was farmland for a family making a living along the banks of the Ohio River, before that it was hunting ground for the Shawnee, and prior to the Mississippian occupation a location of importance to at least one other mound-building group of people. Angel Mounds has a long and storied past, but the present-day dominance of a people who inhabited the site for less than 400 years is the result of archeological interests, and a hard-fought struggle on the part of archeologists and their allies to keep it that way.

Though difficult to imagine standing alone in the quiet open landscape of the site, the sense of timelessness at Angel Mounds is a massive production accomplished through a cacophony of bodies, brains, machines, and grit. If left unchecked the sea of grass that stretches across more than 100 acres of the Angel Mounds landscape would give way to encroaching trees, their roots turning the soil below into crumbly nonsense. Trees that have taken root obstruct both invasive and noninvasive efforts to learn what is going on deep underground. More worrisome than trees and roots, the large earthen mounds that have stood for centuries are continually threatening to wander off, and mix with soils of low esteem and questionable origins through erosion. Below I discuss two of the ways Angel staff create a friendlier place for the practice of archeology, and in doing so become an indispensable, though mostly invisible (Star and Strauss 1999), part of how archeology is made. Mowing grass and felling trees might not seem like a lot to get excited about, but without such interventions, Angel Mounds would grow resistant to archeological investigation in a relentless drive to be something other than what it presently is.

Figure 23. Angel Mounds employee mows grass (2011)

It is early morning when I arrive at Angel Mounds, the grass is dewy and the air is crisp and quiet minus the call of birds in distant trees. The two large gates leading to the Maintenance Shed at the back of the property are open, and after crossing the threshold I see an Angel staff member sitting at a desk through the two large doors at the front of the building. He looks up not completely in surprise, but curious since visitors are not typically permitted on this part of the property.

I have known the Angel staff member for more than a decade so my arrival is hardly worth standing for, but once out of my car he greets me with a joke in which he pretends I am a visitor who has mistakenly wandered too far. I play along and the two of us exchange quips back and forth until he reminds us of the work ahead with some sarcasm about following him around to watch him mow grass, an idea which seems inexhaustibly ridiculous to him.

For several hours that morning I watch the staff member move back and forth across the horizon, sometimes passing behind a grove of trees, or one of the larger earthen mounds before reappearing on the other side. Occasionally the staff member stops for a bit of water, or gets off the mower to move a large limb blocking his path, but mostly he sits looking ahead as he slowly makes his way down the length of the property before turning around and doing it all over again.

In many ways a lot of science involves translating boring things into the fantastical, and at the back of Angel Mounds there are not many breath-taking images of distant galaxies or micro-life to make my task easier. In both Anthropology and Sociology, there are advocates for the need to analyze the everyday and the mundane as much, if not more, than the ruptures in social life. The idea is a critical one, as the things we take as given are often powerful shapers of human affairs (Bourdieu 1977, Bowker and Star 2000). If such logic of the ordinary holds, mowing grass might be the most important factor in the reproduction of archeology at Angel Mounds. One might assume archeologists are busy running around day after day asking new questions and finding hidden answers, but at Angel Mounds archeologists are more like privileged visitors than inhabitants; rarely spending more than a month at the site each year. In their absence, it is the Angel staff who do most of the making at the back of the site, and for

countless hours every summer that involves sitting on a mower, or walking around the property with a weed-eater.

Mowing grass is easy to overlook as a practice of science, a kind of hidden or unrecognized form of labor. For years mowing was the background noise to whatever I found myself doing at Angel Mounds as a volunteer. However, as my study of the site continued I came to realize that for every hour an archeologist spends at the back of Angel Mounds scraping and staring at piles of dirt, Angel staff spend hundreds more mowing grass in a continual effort to keep the surrounding trees from making incursions into what are recognized as the sensitive parts of the site. Undoubtedly, there are times when archeology at the back of Angel Mounds requires a familiarity with theory and methodology, but it also demands a compliant site upon which to impose those theories and methodologies, and to that end the staff at Angel Mounds are essential. Mowing, however boring it might be is no different from the preparation of slides, the calibration of instruments, and the care for animal test-subjects, without such shrouded efforts a lot of science could never happen.

Figure 24. Tree clearing by Site Naturalist/Maintenance Staff (2011)

As I clear the natural barrier of trees and thick brush that divide the archeological soil from the regular dirt at Angel Mounds, I can make out a few members of the Angel staff preparing to cut down several trees in an area at the western end of the property. The previous day a group of archeologists were repelled from the spot by trees and thorny undergrowth, so Angel staff have been enlisted to make that part of the site more welcoming. The location is of particular interests to the archeologists, as they believe two of the former palisade-walls intersect at that location, and if excavated could determine whether the palisades at Angel Mounds were constructed all at once, or at different times.

The work of felling trees is quite dangerous, there are serious risks to those using the saws, clearing the brush, and standing nearby to catch a glimpse of science-in-action. Chainsaws can bind or lurch in the moist wood and hard knots of trees, and when they fall, trees do not always do so in a predictable manner. All eyes watch closely in case a tree kicks back, or deflects wildly on the way down to the ground. Other dangers include flying debris and sharp edges. Gloves, goggles, boots, long pants, the similarities between lab-technicians and Angel staff are many, but they seem less so after a large tree crashes down a few feet from where you are standing.

It takes the small crew several hours to clear the area of trees, short protruding stumps and piles of sawdust are all that remain when they finish. The Angel staff are sweaty and dirty, but no one has anything more serious than a few scratches, and the group expresses some satisfaction in what they accomplished. Yesterday

> *that spot repulsed the most tenacious of the archeologists, but after being cleared of trees and undergrowth the scientists return with the ease of a golf cart, evidence that Angel staff have transformed at least a small part of the site into something a bit friendlier to the needs of archeology.*

Given the enthusiasm with which trees are removed at Angel Mounds, I was surprised to learn they were not always the adversary they are today, and that Angel staff and archeologists alike once advocated growing trees on the slopes of the mounds to prevent erosion. At present Angel staff use a kind of hybrid method in which the slopes of the mounds most prone to erosion are permitted to grow free and tall during the warmer part of the year, but then removed by hand or fire on an annual basis before young trees can establish themselves and impact the integrity of the soil further below. The strategy is not perfect, and erosion from weather and wildlife are still a concern, but generally speaking humans are the biggest threat to the site, and tall thorny plants are considerably more convincing than a few insistent signs that climbing to the top of a mound is prohibited.

The desire on the part of archeologists and their allies to restrain nearby trees is understandable given the chaos they create below the surface, but the removal of standing trees is more puzzling. After all, has the deed not already been done? But Angel staff and archeologists tell me existing trees represent on-going damage in the form of growing root systems, as well as potentially catastrophic damage if uprooted in severe weather. Moreover, existing trees limit their use of large machinery and tools like lawnmowers, tractors, and excavators, and aesthetically speaking, opening up the landscape of Angel Mounds allows staff, archeologists, and visitors alike an unencumbered gaze (Foucault 1970) which archeologists claim is a more accurate representation of the site during the Mississippian occupation. As a consequence, in past years the staff at Angel Mounds have endeavored to remove as many standing trees within the

archeological parts of the site as time and resources allow, with the ultimate aim to have the archeologically sensitive areas of the site cleared of trees entirely.

Locating Archeology

Figure 25. Field notes (2011)

It is early morning and a couple of archeologists have decided to do some work in one of the classrooms at Angel Mounds. Looking around the room there are several tables, and the walls overflow with books, crayons, paper, and classroom supplies of all types. The archeologists waste no time, and in moments several tables have been pushed together, and soon covered with numerous stacks of printed paper, each of those containing countless descriptions, values, and illustrative information about an Angel Mounds the archeologists insist lies just below the surface.

On the table in front of me is a large map with small yellow squares indicating buried structures, red lines tracing the paths of palisade-walls, and grey shaded areas identifying previous excavations. The large map glued to a piece of foam-board provides an amalgamated view of archeology at Angel Mounds over the years, and is also an example of how science finds closure, rigidity, and mobility. More than 70 years of contentious debate, conflicting theories, and ever-evolving methods, are for the moment, united into a single story that quietly sits there as though everything is fine.

The archeologists are presently concerned with translating the varied bits of information in front of them into an actual trench at the back of Angel Mounds. One of the archeologists is flipping through handfuls of documents to double-check the coordinates he plans to excavate later that afternoon, and well aware that a single digit could have wide-reaching and lasting consequences. Inside an

> *air-conditioned classroom everything seems rather straightforward, but he tells me he is anxious, because once among the high grass, rough terrain, and scorching sun things are not always so clear.*

The many documents and maps the archeologists use in their work, and the physical landscape of Angel Mounds are not the same thing, no matter how much the archeologists might suggest, move between, or believe otherwise. To make the map and physical site work together the archeologists must first align them by fixing it all to a Cartesian grid. Though seemingly straightforward, imposing a grid on the landscape of Angel Mounds is not always simple to do, as the site is anything but compliant, and often resist the efforts of archeologists. The scientists seem to have the upper-hand, possessing a large number of high-tech allies willing to lend their support. Alloy metals, radios, and lasers mix with ingenuity, perseverance, and curiosity into what should be an insurmountable advantage. Yet, the task is not filled with the high degrees of certainty and confidence one would expect. In the field things are more complicated, and problems can overcome a highly skilled and well-equipped group of archeologists if they do not remain flexible, creative, and mindful.

There is a lot at stake, and if unsuccessful critical things can get lost, leaving the archeologists unable to identify the foundation of a structure, the location of a prior excavation, or even themselves. In the next section I look at two events that illustrate some of the resistance archeologists encounter in their effort to impose a grid upon the landscape of Angel Mounds. In the first the archeologists struggle to locate themselves. To find anything else it is critical that the archeologists first know where they are. For a group of folks trained in a spatially intensive discipline, locating themselves turned out to be a surprisingly desperate search. In the second, the archeologists look to locate the corners of previous excavations. Confident of where they stand

the archeologists mostly zip about the Angel Mounds property planting little flags around prior excavations. Angel Mounds is not however as passive as archeologists and sociologists generally believe, and the site challenges such hubris with a tax of sweat, blood, obstruction and confusion.

Figure 26. Total station atop Mound A (2011)

At the top of Mound-A the archeologists begin setting up the Total Station, the impressively unimaginative name given to a family of devices that incorporate an array of surveying tasks through an electronic interface and range-finding laser. In combination with a long pole with an expensive prism attached at one end called a Reflector, the archeologists tell me the device is capable of locating any spot on the Angel site within centimeters. In the absence of such technologies the task of finding things would be a lot more difficult, a mixture of measuring tape, calculations, and human error that would increase time and labor, and add to the list of things that could go sideways.

After setting up the Total Station the archeologists begin the search for what they call a Known-Point, a concrete marker the senior archeologists of the group claimed was located on the western edge of the property. The grid coordinates of the marker are shared by other geographic systems, and with a little automated geometry the Total Station can determine the location of prior excavations. The youngest of the group grabs the Reflector then climbs down the steep side of Mound-A into an adjacent marshy area where he was told the marker would be. The marshy grass is high and pitted with knee-deep holes, and I watch as he stumbles in search of what is turning out to be a rather elusive marker.

As the youngest of the group searches around in the muck below, the most senior archeologist provides some brief instruction to the archeologist who will be operating the Total Station that day. However, when he ends his instruction with

no word from below, both the archeologists join my observations and wonder aloud about the cause of the delay. Perhaps the inexperience of the young team member has led him to overlook it? The marker has not been removed or destroyed has it? As more time passes, the situation grows increasingly anxious, and before long all of us are wading in mud and weeds in search of a stone marker that as far as I can determine the whole project appears to hinge on.

The marker continues to elude the archeologists, and there is discussion of abandoning the search and using a different marker. To do so will require redeploying the Total Station multiple times, an unwanted cost for a project with an already tight schedule. The suddenly one of the archeologists probing the ground strikes something hard several inches below the surface, and using the back of his shoe unearths the top of the marker everyone is looking for. For a moment things standstill as the group breathes a sigh of relief, but a few minutes later at the top of Mound-A an archeologist aims a laser at the Reflector positioned over the recently found marker, and they tell me they finally know where they are.

The archeologists consider the Total Station a complex, but relatively straightforward tool, a Black Box (Latour 1987) whose internal workings and assumptions are settled, allowing the use of the device to be simplified to inputs and outputs. Aided by technology contemporary archeology is not bogged-down in the math and tacit skills (Polanyi 1958; Collins 1991) required to measure distances by hand over an uneven landscape. Instead of chains and formulas to account for catenary sag and temperature expansion, today archeologists use a domesticated beam of light to race to a Reflector and back. In a perfect world and a clear line of sight, two archeologists can do what it took a team to do in the early days of Angel Mounds. A history of the Total Station would no doubt reveal a nest of assumptions built upon more assumptions, but for the archeologists at the top of Mound A, Circle Eccentricity, Circle Graduation, and Horizontal Collimation are of no concern. As they contend with muddy ground, thorny plants, blazing sun, and sudden storms the archeologists at Angel Mounds, like most scientists, have little cause to look into past assumptions as long things work (Kuhn 1970).

In practice though, it takes more than inputs and outputs. The archeologists had planned to use a known-point to translate the position of the Total Station onto their grid of Angel Mounds, and from there locate the corners of prior excavations. Instead, the group found themselves frustrated knee-deep in swampy muck, their high hopes for the summer anchored to a missing marker. Eventually the archeologists found what they were looking for, but that outcome was anything but certain, at least for a time. In theory, on paper, and on classroom tables, Angel Mounds is known and well behaved. A prior excavation is here, another there, and archeologists can point to a map to prove it. Out in the field the less certain face of science emerges (Latour 1987), and what was pointed to with confidence elsewhere, becomes a "*maybe"* or "*should be"* as archeologists desperately search for it. The archeologists I followed around demonstrated an impressive capacity to tame the Angel Mounds landscape into something they could work with, but to ignore the drama of how they did it would exclude most of what they did.

Figure 27. Reflector and tree trimmer used in locating old dig sites (2011)

The young archeologist I am following is instructed by radio to make his way several hundred yards to the northwest of our position. We walk together in the

direction given, the archeologists counting his paces the entire time. I am busy taking pictures of the ground, his shoes, the Reflector, when he suddenly comes to a halt. Just ahead in our direction of travel is one of the large wooded areas around the perimeter of the Angel property, and like him, I quickly realize that the location he is searching for is deep within the tangle of briars, vines, and large trees.

From the safety of short grass, I take pictures of the young archeologist pushing his way through the mass of honeysuckle and wild berries. He is wearing shorts, and as he makes his way deeper into the brush thorns extract a toll of blood from his legs that I can see dripping down and collecting at the tops of his socks. Deep inside the web of plants the archeologist places the Reflector onto the ground in front of him and calls for confirmation on a small radio. A few seconds pass and his partner instructs him to move several feet and inches to the south and east.

The archeologist then places the Reflector down on the ground next to him and clears a spot in the undergrowth so he can use a measuring-tape to locate the exact distances he was given. He measures everything to within a matter of an inch or so, then raises the Reflector and calls on the radio again for confirmation. This time the response is delayed, and several minutes pass before the archeologist operating the Total Station at the top of Mound-A reports that he is unable to get a measure.

The problem turns out to be as simple as it is common, the leaves of a nearby tree are blocking the line of sight and the laser is unable to make its way to the Reflector. A call is made to a more senior archeologist on one of the small radios the team is using and he soon arrives in an ATV with a long-handled saw that resembles a medieval pike. The archeologist makes quick work of the tree limb and it comes crashing down next to him as he bolts with his head down trying to get out of the way. The archeologist holding the Reflector then places it back on the spot he measured earlier and waits for conformation.

The accuracy of his location is soon confirmed, and holding the Reflector in place with one hand he carefully inserts a small flag into the ground with his other. The added commotion and removal of the tree limb has informally cleared something of a path through the undergrowth, and I use it to travel thorn-free to take a couple of photos of the tiny flag. We then move on to the next 20-30 locations, where blazing sun, angry bees, high water, boggy smells, and countless other things make our efforts to find the corners of a few old trenches tiresome and difficult.

The archeologist was right to worry back in the classroom. What seems so simple and straightforward on a map from the comfort of a chair at the rear of a museum, is anything but

that at the back of the site. In the heat, pain, and confusion of fieldwork the simplest tasks can sometimes swell into a major struggle. Having followed archeologists around to locate a good number of trenches, I would describe the difficulty of the task as relentless and exhausting. When the bees swarm you run away, when the thorns scratch you wear pants, when the leaves obstruct you cut them away, and then get back to work again. In time though, the cost of so many minor nuisances accumulate, and the will, resources, and time it takes to continue can become depleted. The amount of work that can be accomplished in the field at the back of Angel Mounds is limited for a number of reasons. University schedules, busy directors, limited resources, and travel place constraints on the amount of data archeologists can produce at the back of Angel Mounds.

In my time spent in the company of archeologists at Angel Mounds, I became convinced that the ways in which we think and talk about where science happens is inadequate. Our shared stories of science tell us it should have been a relatively easy matter to locate and mark the corners of prior excavations, as the distances, elevations, and partitions were all well-known on paper. And yet, the process was anything but in the field. A simple view of science works, but only if we ignore the massive effort it takes to accomplish it. At some level the archeologists, Angel staff, and others know this, as they frequently speak of the unique qualities and surprising character of Angel Mounds, but such things are never the focus long. This is not to say that maps and other inscriptions are immutable and always behave, they can go missing, become confusing and irrelevant, but overall such things defy the wishes and efforts of the archeologists far less than things at the back of Angel Mounds, so our studies of where science happens should reflect this more fluid state of affairs.

Fixing Archeology

Figure 28. Archeologists contemplate surprises uncovered by excavator (2011)

With a turn of a key the excavator growls to life before its steel teeth pierce into the ground and carve out the first bucket of dirt. The archeologists move slow and methodically, as a careless action can have irreparable consequences, and archeologists are a cautious bunch if nothing else. The effort seemed to be going well at first, but soon the group starts to find things they were not expecting, and begin to worry aloud that they might be digging somewhere other than where they thought.

The plan was to remove soil from a prior excavation, but mere inches below the surface they discover a cornucopia of artifacts that they would never leave behind. By contemporary standards, the group is finding huge shards of pottery, bone, and charcoal. To make matters worse, there is no sign of the palisade-wall they are looking for. The certainty with which the archeologists so often speak of regarding subterranean matters is absent, and the group congregates around the fresh hole to figure things out.

After some pained looks, sighs, a lot of discussion, and a break for lunch, the archeologists conclude that what they are finding in the trench is the back-fill of an earlier excavation. The presence of such large and significant artifacts is a reflection not of an error on their part, but of different archeological interests over time. Then, standing once again on solid ground, the archeologists continue

their efforts with a renewed confidence as the excavator digs an ever-deepening hole.

The pace remains excruciatingly slow, but the archeologists add drama by grabbing chunks of dirt and charcoal and sharing it with one another. The discoveries are apparently interesting and often amusing to the group, but these things are not what they are looking for, and they soon press on. Several times the archeologists become confused and reconsider things again, only to convince themselves that they are out of the woods and agree to dig still deeper. Then suddenly the group points to a darker band of dirt, and with a little scraping and a bit of debate, the archeologists all agree they have finally located the palisade-wall and former trench they have been looking for.

More often than not the archeologists that work at the back of Angel Mounds eventually make sense of the disorder they experience, but success is never certain, and they are routinely surprised not only by what they encounter, but also how things ultimately play out. Archeologists can be confidently working along one trajectory, and then suddenly with the next shovel full of dirt or scraping from a trowel find themselves hurdling down another. While exciting, and fun to discuss afterwards, in the field uncertainty creates tension and a pressing need to get things back in line. Like a lot of Angel Mounds, trenches and features are by themselves too chaotic for the purposes of science, so archeologists spend a lot of time and energy dressing them up and converting them into something more social (Latour 2005). Through the hands and minds of archeologists, different colors and textures of dirt become respectable things that help tell stories about people who lived centuries ago. The blackish dirt is where Mississippians made things, the blacker dirt is where Mississippians made fire, and the orange dirt does not remember the Mississippians at all.

Once made certain, trenches and features do not always stay that way. In the field the certainty archeologists create can become brittle in the baking summer sun as easily as it can be rubbed out by the thumb of an archeologist who changes his mind. In the discussion below, I

describe two events that illustrate how the archeologists encounter, and then settle, some of the ambiguity they find at the back of Angel Mounds. I begin with how features emerge down in the dusty trenches where archeologists spend so much of their time. Features are born on the sides of walls and bottoms of floors, but they die there too! To be more than a maybe or a fleeting notion, features must successfully run a gauntlet of manipulations, deliberations, and better ideas. Once things settle in the trenches I shift the discussion to how archeologists prevent their fresh recruits from going rogue. As long as things remain in the trenches at the back of Angel Mounds features and other archeological facts are not particularly inclined to stay put, act right, or do anything of much use at all, so archeologists are keen on getting things back to the lab where they have a lot more control of the situation.

Figure 29. Archeologist demarcates soil differentiations (2011)

Having just finished troweling smooth the sides and floor of a trench, the archeologists step back and stare at one of the walls. They remain mostly silent, the occasional sigh and pointing gesture the only consistent effort they make at

communicating with one another. After several minutes, the most senior member of the group takes the end of a metal stake and begins carving shapes into the wall. He appears to be tracing lines along different color variances, but it is not perfectly clear to me. Some of the areas that are lighter or darker than the dirt around them are scratched into definitive shapes, but many similar areas are not.

The archeologist with the stake scratches a line that goes almost straight up for several inches before making a hard right into two deep valleys. Then, stepping-back, he stares at the wall for a few moments, then tentatively rubs one of the lines he scratched into the wall smooth with his thumb. He stares at the blank spot for a few more seconds, and then completes the feature for a second time with a slightly more angled line than the one that preceded it. The other archeologists silently observe, but appear tentative, and at the moment it is not yet clear if they are all in agreement. To get everyone on the same page they discuss other possibilities and considerations, drawing and redrawing the line several times, but eventually make something they all agreed upon.

Eventually the trench is crisscrossed with similar scratches, and the archeologists are discussing what all of them mean together. It is less quiet than it was before, and sometimes excitement overtakes them, but overall chatter is still relatively minimal, and there is considerably more contemplating and nodding going on than anything else. The improved tenor of the group is understandable; the features on the walls have discreetly grown more permanent as time has passed, with skilled hands, considered words, and a handful of ideas now standing in support of the feature a well-rounded defense in in place against any that might raise doubt. Yet the archeologists are not yet ready to commit to dragging their new creations out of the trench, before that happens there is a need for still greater agreement than presently exist.

Before a feature can be called midden, a cut, or a pit, it is first a series of questions, and before that, little more than an outline. In a newly dug trench, things are fluid, subjective, and chaotic, but eventually and with enough effort, things settle down, and features that were once unclear and unruly stabilize and become reliable partners in the stories of archeology. The process begins with shovels and trowels that transform rough chunks of dirt into smooth walls and floors; cross-sections of what we are told are things long since buried. Once cleared of confusing and disorderly dirt, the archeologists begin the task of drawing features in their newly polished trenches. The procedure is not straightforward, and the most skilled archeological eyes

and hands sometimes need adjustment, reconsidering, and a couple of tries to get things right. The outline of a feature may lean this way one moment, only to lean the other the next, before everyone finally agrees it was something entirely different the whole time. Above all, features require a lot of discussion, as their life and death are determined more often than not by the end of a conversation than the sharp edge of a trowel or some undeniable characteristic.

Dorothy Sayers famously compared facts to cows, telling us that both tend to run away when stared at hard enough. I spent time suffering in the dust and heat at the back of Angel Mounds to learn how the archeologists kept their facts from running off. Tools, bodies, thoughts and chats give birth to features, but their lives are precarious at first, and sticking around is more likely if a feature or artifact sits quietly and does not attract too much attention. To have any chance of becoming more than a temporary scratch on a dirt wall or floor, features must get along with others, or they could become untenable and rubbed out of existence. As archeologists draw odd shapes in the dirt at the back of Angel Mounds, “looking at the bigger picture” and deciding “what makes sense” are just as important as the different shades and textures of dirt they are working with. At the bottom of a trench the empirical and theoretical can be equally malleable, what matters most for those down in the dirt is getting back to their laboratory with something a little more solid, certain, and agreed upon.

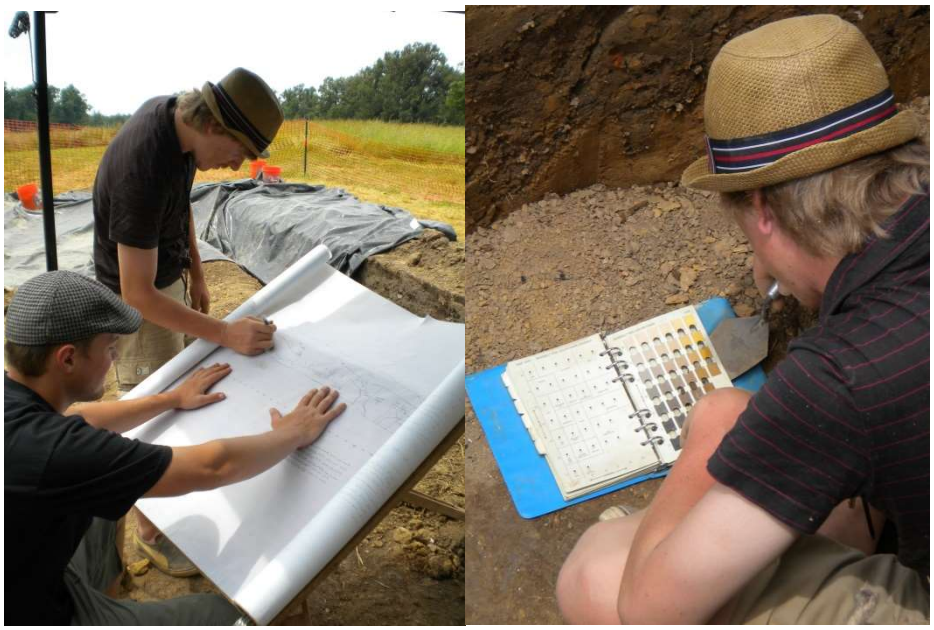

Figure 30. Documenting otherwise irretrievable data (2011)

An archeologist grabs a measuring tape, some metal stakes, and a roll of mason-line and begins creating the axis of a grid at the top of a trench. The archeologists use these simple no-fuss grids to transfer newly made features into scale drawings they can bring back to the laboratory. Once all the pieces are in place, one of the archeologists uses a folding yardstick to trace out several points along the edge of a feature. At the same time, another archeologist standing a few feet away at a drawing-table records the points onto a large sheet of paper using a grid he penciled in beforehand.

When a sufficient number of points are recorded an archeologist connects them into individual features, and then suddenly things scratched into dirt a few hours ago emerge onto paper, lighter, more reliable, and ready to travel. The process continues until all of the features along the entire wall are traced, recorded, and connected. Though the drawing is undoubtedly useful at this stage, some context is important, and the archeologists begin by collecting a few piles of dirt in their features to get some key details for their large collection of curves and lines on the trench walls around them.

Down in the trench one of the archeologists uses a trowel to remove a bit of soil from one of the features they have scratched into the dirt. He then slides the small pile of soil across the openings of a Munsell chart used to determine color, and after deciding which color best matched he shouts the corresponding code to his partner penciling in codes next to features on their drawing. At that point, and with little fanfare, a bit of brownish and reddish dirt at the bottom of a temporary

hole becomes color YR 3/3, and for the moment a little more variability and uncertainty at the back of Angel Mounds disappears.

At the back of Angel Mounds, the archeologists found things were more uncertain than they typically are back at their laboratory, and were understandably eager to return. However, before they could depart the archeologists first had to address some of the disorder and opposition they encountered. That is, the archeologists had to train, induce, or coerce Angel Mounds into something more amenable so they could get the job done and move on. By most accounts the archeologists were successful, and perhaps at times triumphant, but Angel Mounds did not just sit there and go along quietly, it rebelled with all its weight, and then some. The archeologists might have got in and out of the field no worse for wear, but their drawings, samples, and maps were neither free nor inevitable. Down in the trenches soil is continually threatening to dry out and crumble away. Features can be elusive, confusing, overstated, and suspicious. The color of soil is so unreliable the archeologists bring a special chart just to sort it all out (Bowker and Star 2000). I watched archeologists turn the tide on a usually defiant site on numerous occasions, but Angel Mounds always resisted.

In the field the archeologists spend a great deal of effort transforming Angel Mounds into something a little more dependable and fit for travel. First drawing shapes on the walls and floors of trenches, then later carrying paper copies and pieces back to their laboratory. Once on paper and sealed in plastic bags archeology is less mutable and more mobile. In the field I witnessed how the once puzzling, confusing and debatable became clearer, more certain, and less resistant as the discussions, questions, and concerns that once held sway in dusty trenches all went silent. The shift is a remarkable one, and others have reflected on it (Lynch 1985; Star 1983), but how it happens is quite ordinary and largely ignored outside of social studies of science. All through

this discussion the lawnmower, chainsaw, lasers, flags, trowels, grids, charts, staff, ideas, and other allies that allow archeologists to leave Angel Mounds behind are present and accounted for, but will soon leave the stage as science in the field returns to science on the move. The motley troupe points to the capacity of archeologists to mobilize others in the effort to shape Angel Mounds into something archeological, but also the lengths they must go to convince others they know a little something about something. The pressing question is then: What is the consequence of ignoring such an adventurous and collaborative account of the places where science happens?

Discussion

In my introduction to social studies of science I found the early ethnographies of laboratories not only compelling, but fascinating. I was captivated by the intimate and deeply human world ethnographers opened up for readers, each describing a deeply contextualized and contingent science as it was happening. A number of these early excursions into labs demonstrated that science does not happen just anywhere, and where it does happen has implications for both the science and scientists that get (re)made there (Traweek 1988; Henke and Gieryn 2007). Still, for all that social studies of science have done to improve what we know about sites of practice, this earlier work never adequately informed my grasp of what was going on at the back of Angel Mounds. Blood, sweat, and pain were commonplace as I followed archeologists around, and yet all but absent from accounts spent in labs watching scientists do things (Latour 1987). When you follow archeologists around at the back of Angel Mounds you pay the same price as they do, developing an acute awareness of the corporeal and embodied

character of their work, and the surprisingly resistant and temperamental nature of field-work itself.

In the heat and bugs at the back of Angel Mounds I admit to an increasing (albeit temporary) curiosity about what archeologists do in their air-conditioned laboratories, but as a suffered an important realization occurred. If there is one aspect of archeology that could be called routine at the back of Angel Mounds, it is that the site itself is uncooperative, and a thing which people struggle to change into a more favorable form. Using the concept of struggle, I first described how Angel Mounds is kept archeologically friendly through monotonous and uninteresting acts like mowing grass. The effort to preserve the site for the needs of archeology is exhausting, dangerous, and mostly invisible, but Angel staff needs the site to remain archeological, or they stand to lose an important draw in a state where fewer visitors can result in getting shuttered, and so they are easily enlisted in the effort. I then described how archeologists moved around Angel Mounds searching for what they know. Though the landscape of Angel Mounds is almost completely open, the archeologists remained unsure of where they and many other things were for a surprising amount of time, and once they did locate themselves and other things, they had to work hard to keep things that way. Lastly, I described how archeologists created order, permanency, and mobility down in their trenches with scratches, scrapings, measurements, discussions, ponderings, color charts, and a bit of pencil and paper. At the back of the site the archeologists find Angel Mounds less predictable, obvious, and agreeable, and they move as quickly as they can to get things transformed into something relatively stable so they can draw a couple of pictures, grab some handfuls of dirt, and get back to the less chaotic and more comfortable surroundings of their lab.

Like others (Henke and Gieryn 2007), I have stressed the continued importance of place in the making of scientific knowledge. More importantly, I have sought to push the theorization of science and place beyond what I believe to be a rather unsuitable state. Our theorization of where science happens is far too human-centric, and I believe we should assign greater agency to our sites of practice. To treat scientists, other humans, their many things, and the places they work with greater symmetry is a cornerstone of social studies of science, but while significant strides have been made, there remains more to do. In the discussion above I described how I labored in and out of the field with archeologists and others to bring our sites of scientific practice into our analysis as something not altogether known and understood, and to give them greater capacity to act in our accounts. In my field-notes I describe the way I felt and looked, and as best I could the feelings and looks of others. In the absence of a more agentic Angel Mounds it is difficult to account for the physical demands of archeology, as well as the time, energy, and resources archeologists appear to forfeit in the field. Rather than capturing the creativity and dedication of scientists, treating sites of practice so passively promotes the idea that the work of scientists is robotic and formulaic, or at least fortuitous and haphazard. Employing Angel Mounds as yet another actor, we not only eliminate a priori assumptions about what Angel Mounds can and cannot do, we also allow pain, sweat, and tears to speak to the resistance that Angel Mounds is capable of, and through which the obsessive drive and creativity on the part of archeologists and their allies transform the site into something a little more socially respectable.

CHAPTER 5

CONCLUSION

The genesis of this project is rooted in a simple observation. If science is universal, and the question of where has little or no bearing on scientific knowledge, why not a more even or random distribution across space? Similarly, there is talk of how technology is increasingly minimizing the relevance of distance (Castell 2000; Harvey 1990), yet science continues to concentrate unencumbered. Far from unrelated, universities, libraries, and other places are essential to making science happen. It might be true to say that science zips about nowadays, but science also settles here and there. Angel Mounds was not made less influential by the increasing speeds of research, to the contrary, if anything the force of digital archeology crashing into the site makes it more important and commanding. Archeology moves rapidly as immaterial code, but by the bucket-full it moves much slower, and at the back of Angel Mounds downright geological. I have observed scientists sending decades of archeology hundreds of miles instantly with a couple of clicks on a computer, but I have also seen it take them the better part of a month to lift some archeology from the bottom of a trench at the back of Angel Mounds. The notion that science and place are somehow not associated with each other appears rather absurd on the grounds of Angel Mounds. Sweating and exhausted at the bottom of a dusty trench or a sunbaked field, with archeology emerging, surging, and disintegrating all around you, it is difficult to

imagine how a place could matter more. Knowledge swirling around the globe certainly warrants a look, but where it lingers does too.

For this project I chose to emphasize the importance of place in science. Instead of empty distances traversed in flashes of light, I describe Angel Mounds as a muddy and bloody mix of scientists, theories, shovels, and budgets all plodding along to create a little more order in the chaos around them. I have also not been shy about talking down to science and talking up dirt. I permitted Angel Mounds the chance to resist, join, surprise, and as a result the site took on a much livelier air. Angel Mounds works with us, but I learned it sometimes works against us too. On the ground, Angel Mounds is far from a weigh-station. Following archeologists and others around in the heat and dust at the back of Angel Mounds, sweat, grit, dirt, blood, hopes, and a lot of intentions are scattered about. Artifacts, theories, methods, reputations, careers, it all gets a bit fuzzy at the bottom of a hole (or the top of a mound), and you are not always sure what is what. I have tried to reflect this contingent and autonomous character of Angel Mounds in the previous chapters, not simply because it is a more empirical representation of science, but also because it provides glimpses into the deep and intimate ways we experience place. When the backdrop of science is cast a leading role, the places where science happens are finally allowed to join the action they have always been forced to contain.

Situating Place

To raise questions about why science clusters inevitably leads to responses about the variable material demands of science. Like most productive activities having what you need nearby makes for an effective way of getting things done. In the case of Angel Mounds, archeology is not possible at the site without the dirt, trowel, labor, and other resources gathered

there. Though science is said to be rapidly digitizing, many things at Angel Mounds remain analog, and the advantages of bringing everything together in the same place still matters. Close proximity is also essential to the circulation of tacit knowledge, embodied knowledges and skills transferred through the depth of experience rather than verbal and written instructions (Polanyi 1958). Whether building a laser (Collins 1974, 1991), a mathematical proof (Rowe 1986, 2004), or using a trowel the practice of science makes use of a lattice of competencies which cannot simply be written down and distributed easily. Lastly, bringing things together in the same location allows for chance encounters, unexpected meetings which sometimes yield new information, problems, and solutions (Allen 1977; Boden and Molotch 1994). In these Trading Zones (Galison 1997) humans and non-humans bump into each other and generate things that cannot be fully predicted or planned. In fact, for some (Merz 1998) it is the unforced character which is the essential component for creating new and unusual happenings.

The physical space of Angel Mounds is literally monumental, but it is also roughly half of the matter. Material considerations are part of why science is done here and not there, but alone they prove a poor determinate in the biography of Angel Mounds. Social studies of science have described well the great range of people and things brought together to make science happen, and suggest that places like Angel Mounds are simultaneously the result of many social considerations as well. The earthworks at Angel Mounds are unrivaled in Indiana, but their size and quality stand in contradiction to the relative lack of attention Angel Mounds experienced as smaller sites were being excavated all around in the early days of archeology in Indiana. The right place for doing science is often as much about prestige, careers, beliefs, and convention as it is cost, time, and supply. Angel Mounds was some curious hills on a neighboring farm until

new methodologies, deep-pocketed patrons, historical levels of unemployment, and a curious public helped make them something more. Large piles of dirt hint to why archeologists came sniffing around from time to time, but alone leave much unanswered. The making of Angel Mounds was through and through heterogeneous engineering (Law 1987) where no single element was so persuasive as to determine the destiny of the site entirely.

As Angel Mounds grew in size it also grew in influence. Hughes (1983) notion of Momentum in studies of technological systems seems instructive. Among the massive mounds it is easy to appreciate the power and inevitability of Angel Mounds. As dirt and people have continued to entangle the site has become increasingly substantial, set further in motion, and more difficult to ignore. As a metaphor for Angel Mounds the concept of Momentum captures the sense of inertia behind the historical trajectories of the site, but it seems a bit hollow, and fails to capture the full density of Angel Mounds. In the early part of the twentieth century Gottingen is described as a cauldron of activity with an inspiring atmosphere which attracted many mathematicians to the city (Henke and Gieryn 2007: 357). As Gottingen did for mathematicians, Angel Mounds did for archeology in Indiana. On second thought, perhaps the notion of gravity better captures the influence of places like Angel Mounds, but in the end what matters is that we come to understand that where science happens is more than a question of distances and efficiency. Gathering a bunch of things at one place seems to create its own reasons for science to huddle and stack.

Negotiating Place

In chapter 3 I looked at how Angel Mounds is materially and discursively ordered and reordered in an effort to resolve some of the tensions between the different groups that make

archeology happen at the site. At Angel Mounds the architectural elements of the museum or access to the back of the site can legitimize things as proper archeology, or mark them as something else. Knowledge labeled science is typically associated with places that are unlike anywhere else, as the ordinary risk stigmatizing the knowledge (Ophir and Shapin 1991). The stakes are sometimes high, amateur botanists at the turn of the nineteenth century might have thought they were doing science, but for those with the authority to say so, botany cannot happen in the pubs where the budding botanists exchanged their many specimens, treatises, and taxonomies (Secord 1994). Laboratories are an instructive example, their uncommon levels of control allowing us to believe their clean and methodical spaces purify the knowledge they produce. In practice laboratories prove as susceptible to the cluttering and disorganized vagaries of research everywhere, but their reputation as cleansed and purified sites effectively demarcates what scientists say and do from that of everyone else.

The conflicting public and private aspects of Angel Mounds are perhaps the most salient features of the site. The solitude of the hermitage, library, or wilderness might minimize corrupting influences, but claims and practices must also be shared, witnessed, and joined if science is to see any sizable success (Merton 1973; Shapin 1988 Ophir 1991; Gieryn 2002b). Archeologists need isolated spaces at Angel Mounds to contemplate their handfuls of dirt, protect artifacts, and ground claims. The many backstage spaces at Angel Mounds are essential for achieving convincing performances (Goffman 1959), as less than polished displays lead audiences to surmise that the facts, theories, and findings are less than certain, or the people behind them less than capable. At the same time archeology at Angel Mounds is contingent upon high levels of public engagement that subsidize much of the care and maintenance of archeology

at the site. As with other sites (Gieryn 1998), the private and public parts of archeology at Angel Mounds are made through the arrangement and meaning of space. In floor plans and formal protocols privacy is achieved with the aid of doors, locks, sanctions, and hours of operation. However, in practice such measures are often seen as unreliable, and results in ongoing frustration for those who rely upon them.

Differentiating dirt from soil is another common set of negotiations that take through the physical and symbolic aspects of Angel Mounds. Dirt can be found anywhere, but for archeologists soil is less common, valuable, and in need of protection. Angel Mounds utilizes layers of control to ensure that artifacts are not only removed or robbed, but just as importantly, damaged by the actions of staff, demonstrators, and visitors. High fencing, river currents, and law enforcement are essential, but not always deemed sufficient, so anxieties emerge about wandering water, roots, wildlife, and feet. Moreover, archeologists tend to find archeology just about anywhere they look, and as they have progressively surveyed more and more of Angel Mounds, their concerns have sometimes expanded beyond the historical boundary of soil and dirt at Angel Mounds. Archeologists, staff, and others add signage and fencing, improve drainage, and mow regularly to address issues before and as they arise, but Angel Mounds is more than an archeological field-site, it is also a museum, nature preserve, and workplace, and as such the needs of archeology must be balanced with the needs of others. As with privacy, the indeterminacy of fences and ditches, as well as the more formalized rules governing what goes on where at Angel Mounds are often understood as a liability, but in practice such flexibility allows archeologists, staff, and others to accommodate the changing and often conflicting demands placed on them and the site.

The conflicting demands of science have at times been understated. ANT in particular has been charged with oversimplifying how science assembles the heterogeneous components of which it is comprised. The networks of ANT are said to be over-formalized (Winner 2003) and too reliant upon singular entrepreneurs endowed with heroic levels of influence (Star and Griesemer 1989). Put simply, black boxes (Latour 1987) do not adequately reflect that associations are always subject to multiple reinterpretations and rearrangements. Using the case of a natural history museum, Star and Griesemer propose the concept of Boundary Object, which they describe as a scientific object that inhabits several intersecting social worlds, and which are plastic enough to adapt to the local demands of different groups, yet robust enough to maintain common identity (Star and Griesemer 1989: 393). Though they were seeking to address a broader methodological matter, the choice to study a museum is doubly beneficial for studies of place and science.

Cooperation at Angel Mounds is not always easy or assured, and it is not uncommon to find one group going one way, and another going the other. A lot of effort is spent sorting everything out at Angel Mounds. Things get mixed-up all the time, and it is rare to know exactly where you are, who and what that is, and when it will happen. To keep things moving along a lot of decisions must be made with only an inkling of what is going on, but on the ground even mundane decisions seal the fate of an artifact, and along with it, the places, people, and society that accompanies it. Creating features and artifacts at Angel Mounds is at the same time the making of careers, memories, communities, and feelings. In short, an entire world to ensure it thrives (Latour 1988). The indeterminate character (Bijker et al. 1987) of Angel Mounds is again, not always a liability. In fact, such flexibility is a key resource for balancing the varying

demands that must be accomplish at the site. Epistemology is frequently a concern, but not always to the same degree, and this is why Angel Mounds is more than a strange interest of a few archeologists.

Agency and Place

Finally, in chapter 4 I followed archeologists and others around Angel Mounds to inject a bit more agency into the concept of place (Gieryn 2000). For all that earlier social studies of science have accomplished on the topic of where science happens, I believe the concept of place remains overly bound in constructivist approaches. People certainly have a lot of say in the destiny of Angel Mounds, but the site plays a part too, and our concepts should (at least at times) reflect that fact, whatever the epistemological hazards.

To better capture the agency of Angel Mounds itself, I used the concept of Struggle to theme the events I observed at the site, and which I suggest are indicative of the degree of agency the Angel site is capable of generating. In addition, I also make use of something like personification when discussing the site and other non-humans, as I suggest it produces a perspective which does not make a priori distinctions, and allows one to remain sufficiently agnostic about the character of both humans and non-humans alike. The move could be seen as radical, or worse, reactive, but my decision is one of symmetry, the same symmetry that has brought so much value to social studies of science in the past.

I began chapter 4 by discussing how in the absence of archeologists, it is Angel staff and others who do most of the work of keeping Angel Mounds archeologically legible. Those invested in Angel Mounds understand it to be continually in danger of running wild. To keep Angel Mounds a reliable ally of archeology, the staff spend hundreds of hours cutting and

removing grass and trees, as well as monitoring the movements of guests, weather, and animals. Without such efforts, Angel Mounds and the archeology it produces would not be possible, and this raises interesting questions about the invisible contributions of science.

Later in chapter 4 I describe how surprisingly difficult it is to keep things in place in the open landscape of Angel Mounds. To keep themselves, and many other things where they were at the back of Angel Mounds, archeologists had to employ some serious technology and some rather practical techniques. At the back of Angel Mounds everything, including the archeologists, could be lost in a moment if great care and effort were not made, and this suggest that the geography of place is considerably more fluid than our current understanding of place allows.

Lastly, I discussed the struggle of archeologists to keep their newly emerging trenches, features, artifacts, and ideas from becoming confusing, or simply falling apart. To make things more durable and ready for transport away from the many hazards of doing archeology at the back of Angel Mounds, the archeologists made use of an array of techniques to discipline and restrain their piles of unruly dirt. The path to obduracy is not at all a certain one, and despite their great efforts a good number of theories and facts die at the bottom of their dusty trenches, but to those which succeed, they can look forward to future archeological success and relevancy.

In the end, I use chapter 4 to suggest that there is value in paying attention to the bodies and soil at Angel Mounds. That in the pain and sweat of those who toil away at the back of the site we have metrics from which to theorize the agency of Angel Mounds. That is, in giving Angel Mounds the opportunity to act-up methodologically we produce a less human-centric

perspective of science and the places it resides, and a better balance between the social and natural realisms which do not adequately capture events at Angel Mounds.

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VITA

Dr. Joseph A. Renow received his doctorate from the Department of Sociology at Loyola University Chicago. His interest in science and technology overlaps with medicine, the built-environment, and expertise more generally. Specifically, his work examines the way different groups come to agreement about what is true, best, and right, and how these decisions come to shape the lives of others and society at-large.

While at Loyola, Dr. Renow was awarded and received a Doctoral Fellowship (2007-2011), and engaged in a number of projects, including an ethnographic study of the Loyola Information Commons (2009), a historical project examining the design and construction of a large interstate (2010), and an ethnographic study of Angel Mounds, an active archeological field-site and Native American museum (Dissertation 2021). His current project seeks to better understand how the design and architecture of hospitals and clinics render the bodies of patients medically legible.

Dr. Renow has presented his research at various regional and national conferences, and while at Loyola regularly presented in the department's annual symposium. He currently holds a Visiting Professor position at the University of Evansville, and looks forward to a career of teaching and research around issues of social justice as it pertains to the experts who build our world.