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A Provenance Research Study of Archaeological Curation

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Dedicated to Clara and Laura, teachers par excellence.

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A Provenance Research Study of Archaeological Curation

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Archaeological curation is the process of managing objects and their documentation after their discovery in an excavation. It is an activity that occurs in the context of particular regulatory frameworks for archaeological conservation and historic preservation. Yet field archaeologists assert the continued presence of a "curation crisis" and collecting institutions are responding to ongoing dialogues for transparency in information about museum collections of antiquities, as upheld by the 1970 UNESCO Convention against looting and the sale of unprovenanced artifacts. Curators face an overwhelming volume of materials that demand curatorial attention in the form of provenance research, a pursuit which uses records and research generated during archaeological excavation fieldwork to construct a narrative of the object's history from creation to display. Such provenance information supports the curation and public presentation of archaeological collections in museums, settings that currently bound our empirical understanding of curation. This dissertation finds that curation occurs in multiple settings but that curation activities are not well-coordinated. It examines the curation contributions of archaeologists and conservators, among other participants, that culminate in museum exhibition of objects. Fieldwork for this study occurred at four research sites including archaeological excavations (classical as well as contract and archival), a conservation lab, a curatorial facility or repository, and a state museum. The core findings of the study articulate archaeological curation as a discontinuum of distributed work, and the formation of the discontinuum through problematic data handoffs which arise from gaps in data interoperability

and use purposes between four professional communities of practice. Handoffs between excavation, conservation, collections care, and exhibition activities impact the research potential of artifact collections – especially significant for museum archaeology practice and the public storytelling role. This provenance research study of work practices builds on archaeological, archival, and museum scholarship to articulate where, at these handoffs, separate communities of practice might collaboratively address archaeological curation issues. In positioning archaeological curation as a set of recordkeeping actions, this dissertation identifies opportunities for future research on coordination of data practices between multiple participants.

Table of Contents

List of Tables

List of Figures

1. Introduction

Objects fascinate people. Objects are the tools, signals, signs, symbols, and sources of human civilizations and the material culture around which the research community of archaeology gathers in a common enterprise. Archaeologists demonstrate through their work a deep conviction that objects individually contain information about culture, and collectively form a dataset that allows broader understanding of the past. Curation of objects ensures future access to rich knowledge of our past. Yet to understand the challenges facing the practice of archaeological curatorship within the field of museum archaeology, we must first comprehend the impact of particular field research activities, through which objects arrive in a collection. This dissertation views archaeological curation as a discontinuum: a set of diverse practices involving actors and objects which begins at an archaeological excavation and traverses a circuitous path before concluding at a collecting repository and possibly a museum exhibit. I acknowledge that beyond absolute location of archaeological findspot (provenience), an object's facets may be studied in multiple ways over the course of its provenance history; each interaction may generate different documentation. I define documentation as any physical manifestation of the object's presence, including evidential markings, supporting notes, and physical recordkeeping. Pragmatically, my research focuses on understanding how multiple participants in archaeology interact with objects and create documentation, two distinct aspects of the archaeological record. In this way, my study is itself a work of provenance research, one carried out with respect to the management of archaeological collections.

RESEARCH OVERVIEW

Archaeological conservation is a broad field concerned with the preservation of cultural heritage, particularly of objects in material form (Avrami, Mason, and de la Torre, 2000; Sanford, 1975; Singley, 1981). Both in situ archaeological sites and collections are nonrenewable resources that are jeopardized without effective stewardship. Enormous quantities of collections that document sites are stored in a range of repositories, but archaeologists forget or neglect to fund collections care in the rush to dig, and overstrained repositories receive insufficient funds, expertise, and space to accession responsibly. There is a general perception in this field that repositories have too many objects with too little documentation. Yet more students, professionals, and museum visitors desire access to archaeological collections for scholarly research (Nelson and Shears, 1996) even as repository managers find little professional infrastructure exists to support these demands. Previously, Meyers (1993) recognized that documentation about objects had gone largely ignored as part of this field's scope, a problem that contributed to the field's "curation crisis" because archaeological objects lacking "context" could not be properly cataloged. Meyers advocated for an archival management approach in addressing problems arising from the separation between archaeological documentation and objects. My study builds on this and related research but more closely examines the professional contexts of creation that generate this documentation. I examine documentation as evidence of data curation work that occurs outside repositories, attending to the production and use of documentation by archaeologists in the field and by conservators as objects travel to a collecting institution. My emphasis on understanding object and documentation paths builds on concepts presented in Sullivan and Childs' (2003) *Curating Archaeological Collections: From the Field to the Repository*. While this handbook provides a very useful framework for thinking about curation as

a faceted process, it is characteristic of previous research scoped as compendia of best practices. My contribution to this area of research is to examine how and why these practices are structured along professional boundaries, using ethnographic methods to closely study particular documents and curation professionals.

My study recognizes the importance of paths in understanding the provenance of archaeological data. In studying paths I discover particular handoffs that mark changes in the creation and use of archaeological data. I use narrative to connect the past, present, and future of archaeological collections and to make process visible (Brooks and Clark, 2001: 3). My analysis makes visible the process of archaeological curation and demonstrates how curation work begins at the site of an object's excavation. Because curation activities occur not only at field sites but also, and more commonly, at museums and other collecting institutions, I maintain that archaeological curation is a multi-sited phenomenon. I observed what curation activities occur at four research sites. Whereas a traditional ethnography presumes that a single site encapsulates a set of social relations of interest, a multi-sited ethnography examines such relations in a logical sequence "of parallel, related local situations." Multi-sited ethnographers aim to "follow people, connections, associations, and relationships across space (because they are substantially continuous but spatially non-contiguous)" (Falzon, 2009: 1). I focus primarily in this research on closely studying professional interactions with archaeological objects to explain how different curation participants put records to use. Artifacts and their documentation are very distinct, and each is likely on a distinct curation path, as I state in Chapter 3. My project followed both through four kinds of research sites. Thus my research, in presenting a more holistic narrative of curation, identifies what actions are performed by different participants and where key transitions occur along objects' path to a collecting institution. Examination of these transition

points will ultimately provide evidence for developing new curatorial strategies for the overall management of archaeological collections. The process of provenance research is time-consuming and becomes the responsibility of curators often involved disproportionately late in the process. My research establishes a necessary foundation for maximizing the impact of time spent by curators on a collection. Archaeological curation could become less of a strain on the museum profession if we had a better understanding of where to prioritize and direct resources. There are particular problems specific to the curation of archaeological objects – including negotiating complex ownership issues and assessing objects for further conservation, cataloging, and access – that are at the heart of my analysis.

In Chapter 2 of this dissertation I introduce and situate the activity of archaeological curation within an interdisciplinary arena of practitioners, and specifically explore practices that characterize museum archaeology. I argue in Chapter 3 that our understanding of archaeological curation work should be expanded from those activities that occur in a museum or archive, to recognize a path which began at an archaeological field site. I present the research questions driving my data collection in Chapter 4 along with a discussion of the methods I employ in my study and the context of my research sites. I draw on the analytical framework of communities of practice to analyze the heterogeneous data and perspectives I gathered through my fieldwork. Chapter 5 presents my findings in three parts corresponding to my research questions. First I examine what actors perform archaeological curation and the unique contributions of archaeologists, conservators, collections managers, and exhibit makers. Second I explore whether archaeological curation is a professional community and I argue that by prioritizing a myopic rather than relative perspective towards data(base) creation, distinct communities remain isolated partners in a discontinuum of practice. Third I articulate four handoffs that occur when

the four communities must share documentation. I define a handoff as a problematic break in documentation that accompanies a change in owner for an archaeological object. I identify five specific contributions of this study and several opportunities to further explore and support curation issues from the researcher perspectives of museum and more broadly information studies in Chapter 6. This dissertation works to assemble sufficient evidence about curation work to support further research and strategies on interactions involving multiple data contributors.

Methodologically, I made the creation of documentation a core focus of my study and sought accordingly to gather examples of the documents created by my participants over the course of their curation contributions. I closely read these documents for their form and content, and subsequently analyzed them as part of a pervasive framework of practice, which I have named a "discontinuum." I define a discontinuum as a set of connected but uncoordinated major activities that contribute to a goal but are carried out by actors with distinct professional concerns. Because my unit of analysis is an entire occupational practice rather than a specific digital or physical object, I employ the communities of practice framework. In this work I follow the topic of curation through four kinds of research sites. While immersed in each site, I attended to particular objects and their documentation, informed by the object biography framework offered by Alberti (2005), in order to discover all of the evidence, subtle and obvious, that might make up archaeological curation work. Mine is a study of curation as it is practiced across institutions and professions, rather than a close reading of any one object. I aim to understand what object handling practices are performed at different sites in the archaeological workflow and to gather this data I used a broadly occupation-oriented lens. I explored how object provenance gets recorded at field sites, in a conservation lab, at a curatorial facility (repository),

and in a museum. In observing these practices, I sought to read in detail the content of documentation that is created as a result, e.g., as database records, notes, and photographs.

AN OCCUPATIONAL LENS

My research study examined archaeological curation by closely studying the documentation produced at different stages in the formation of an archaeological collection. That is, to create a holistic picture of curation practice, it identifies what records participants produce during four work activities: excavation, conservation, collections care, and exhibition. In order to observe this documentation being generated, I engaged four professions, including but not limited to museum curators. My research participants each interact in different ways with archaeological objects which are often grouped for handling purposes according to their material class. In archaeology, a class refers to a grouping of artifacts by material (e.g., animal bone, plant seeds, pottery) that facilitates comparison with other collections. A collection of objects belonging to a single excavation can include multiple classes, such as coins,[1] pottery, plant seeds, or animal bone. I study professional contributions to archaeological curation at each of my research sites, and the study design is connected not by a single collection but by a focus on observing curation in general. Thus my four sets of data are heterogeneous, but they each reveal a rich and detailed view into that contributor's role in carrying out curation activities.

Together, my study's results frame the research topic of curation in a macroscopic way, drawing out the impact of particular processes for the work of other partners in (museum) archaeology. No one object or class was consistently present across all my research sites, though

[1] Among the *La Belle* collection of 1.6 million objects are coins, wood timbers, clothing, cannons, and beads that

it would be fascinating to pursue such a retrospective object biography in future research. Instead I used the objects that were present at each site as an entrée into understanding the work practices carried out by the participants I interviewed and observed. These objects and the activities surrounding them offered the best representation of the *processes* in place at my research sites.

My research study (further detailed in Chapter 4) tells a story of curation, or recordkeeping history, beginning in excavation and concluding with exhibition. I align my research with contemporary conservation and archival theory that places a search for the functional, or even social, utility of objects above a search for an ideal truth or objective universality about them (Muñoz Viñas, 2002; and also Johnson, Heald, Mchugh, Brown, and Kaminitz, 2005). Yet such theories have thus far only been applied to understanding objects themselves, in an anthropological sense, whereas my core focus is on understanding curation as part of the profession of museum archaeology. Oriented toward models of practice, my research will construct an illustration of work *process*; specifically, of curation and its recordkeeping behaviors and traces.

2. Where and Why of Archaeological Curation

This chapter takes a two-part structure in exploring the makeup of archaeological curation as a multi-faceted activity today. First I look at professions whose work might relate to archaeological curation and literature on related ethnographic studies. Next I explore why museums have come to occupy such a large presence in the management of archaeological collections, and I study why the presence or absence of provenience and provenance data impacts the research potential of archaeological collections. I conclude this chapter by discussing a problem central to archaeology and to my study: the rise of a "curation crisis" and the scope of archaeologists' current efforts to responsibly manage artifact collections. This research will improve our understanding of how curation delays pose a barrier to accessing the results of funded archaeological projects.

In the United States, archaeological curation exists inside the societal confluence of museum institutions, archaeological practice, regulations at the federal, state, and local levels, and research from at least three academic disciplines – archaeology, museum studies, and archival studies. In this research, I define "archaeological curation" as a continuous process that encompasses collections management activities performed on a set of objects, including their accession, conservation, display, storage, and long-term preservation (adapted from Pearce, 1990). Curation encompasses several handoffs of objects and documentation on their way from archaeological custody to museum custody. Curatorial work also involves the exercise of professional judgment to negotiate the moral, legal, intellectual, and physical boundaries within which museums and collecting institutions operate. I pause briefly to acknowledge that the term "curation" has in recent years escaped both its historical attachment to art museum practice and

its conceptualization by Lewis Binford to refer to people's use of handmade tools (Lee and Tibbo, 2011). "Everybody's a curator" (Johnston, 2014) as one newspaper has announced, and the prevalence of online platforms' "curated content" indicate that the term has entered the popular zeitgeist. In this study, I use "archaeological curation" in a different and more specific way, referring to the administrative and practical management of archaeological collections for purposes of long-term preservation and access. Archaeological curation, I argue, comprises a set of overlapping professional activities, including artifact conservation treatment.

From the perspective I inhabited over the course of my research, I observed that the management of archaeological collections on a macro level is uneven; while standard practices may exist, they are not uniformly implemented for all archaeological data sources. The quality of practices is also variable, with some collections housed in near-optimal environmental conditions and others wilting, fading, or deteriorating from overexposure to the elements or from other hazards. In fact, data management in archaeology poses unique challenges from both an academic perspective – the field of archaeology has historical roots in humanities inquiry but uses highly sophisticated scientific techniques – and from the practical vantage points of geographic regions. Yet for me, the role of museums in preserving archaeological data is of paramount interest because of the singular role they play in generating public awareness, appreciation, and support of the archaeological enterprise.

Museums communicate understandings of the past that are based on archaeological interpretations of artifacts. Museum curators tell the stories of artifacts through exhibits. Still, a known truth in the museum field – and one popularized on film – holds that for every object on display in a public gallery, there are dozens or hundreds more in storage, objects that have perhaps been seen only by a handful of people – the professionals, including archaeologists, who

are responsible for their accession by the institution. In the 1970s, increased collection volume attracted the label of the "curation crisis," a name which persists today even as museums have made significant progress toward accounting for the totality of their holdings. Federally-funded programs of "salvage archaeology" begun in the 1920s generated enormous quantities of survey or excavation materials that state and local museums accepted without detailed documentation of provenience. As one scholar writes of academic archaeology in Missouri, "When a project ended, in would come boxes and boxes of stuff" (Marquardt, in Childs, 2004: 169). In 1992, the National Park Service estimated holding 24.6 million archeological artifacts, 16.8 million of which needed cataloging at a cost of $46.9 million (Hitchcock, 1994). Jelks (1989) visited 34 repositories in eight states and determined that curatorial practices at most of the repositories did not meet acceptable standards; I explore these issues further in Chapter 4. Scholars in the field of archives articulated a very similar situation only slightly more recently, as the work of Greene and Meissner (2005) catalyzed several nationwide efforts to expose hidden collections and accelerate processing beginning at the level of the collection. Thus, the "curation crisis" phenomenon became a core motivator for my study: how do field archaeologists address curation and create documentation about objects? Is curation expertise part of site excavation workflows, and who performs it? These motivating questions operate from the belief that archaeological curation might be improved if, in general, it were already in progress before the stage when an archaeological collection is accessioned by a museum. Through contributing a descriptive understanding of curation processes, my research efforts aim to facilitate improved interactions between museum workers and archaeologists by drawing attention to existing practices leading up to collections management (the stage where the problem is finally said to have surfaced). The following two subsections describe the current environment of archaeological curation from,

respectively, an understanding of multiple contributing professions, and attention to collections recordkeeping. By understanding why museums are intertwined with archaeological research we will be more equipped to view how each curation contribution shapes collections access.

POSITIONING ARCHAEOLOGICAL CURATION AT AN INTERSECTION OF PROFESSIONS

Curation occurs most commonly in museums, yet museums themselves are but one part in American archaeological practice. Swain (2007: 47) considered four other domains that play roles in the American archaeological field, including (semi-)commercial organizations, universities, state or local authorities, and private bodies / individuals. Based on these domains, my research design surmised that curation might be a multi-sited activity, one that would involve museums, repositories, conservators, and archaeologists as I present in Figure 1. This figure depicts archaeological curation as a set of professional activities connected to each other – excavation, conservation, collections care, and exhibition – with documentation generated at each activity.

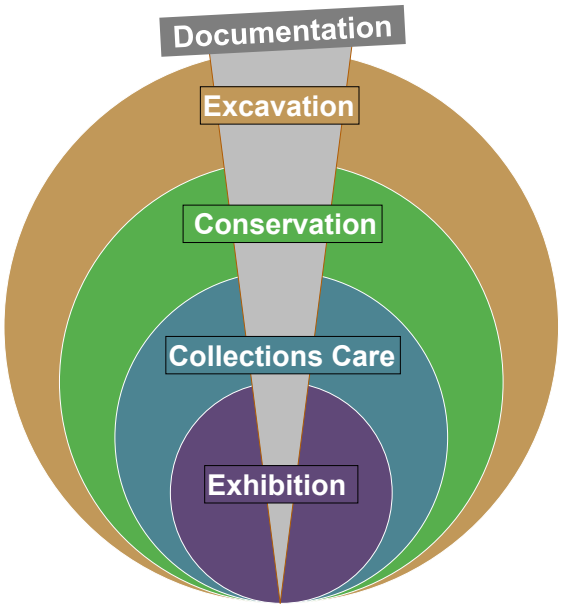


Figure 1. Activities Involved in Archaeological Curation.

Despite the museum-centric view of curation in the literature which I capture in Figure 1, I believed that professionals other than museum curators might be involved in curation activities. Taking a broad view of curation beyond the museum, this research studies what activities archaeologists and conservators carry out that have been ignored in existing guidelines and mandates regarding collections care in regional repositories. An occupational lens allows me to see how distinct professions might interact. After analyzing such interactions, we might be able to identify specific areas to pursue future coordination efforts with these community participants. While I recognize that other research methods – surveys, quasi-experiments, and experimental research – would illuminate other aspects of curation work, in this project I am particularly interested in examining object-level activities and personal interactions, and believe that an ethnographic approach affords this richness of detail. I also acknowledge that professional collections care is affected by such external factors as the allocation of funds and resources for

the other functional priorities of a museum or repository, the regulatory and legal frameworks impacting the contemporary practice of archaeology in the U.S., and the public perceptions of museum work, although these are not the core focus of my research. Below I briefly examine prior ethnographic studies of three professions: museum curators, archaeologists, and archivists. I draw on my review of literature here to form my research design and my research questions, and so that I might understand where these professions intersect. Part of the reason why few research studies attend specifically to archaeological curation issues is because, I argue, this community belongs nowhere (its disciplinary home is neither archives nor archaeology nor exclusively museums), and this review enlarges my understanding of professions involved with archaeological collections.

Archaeologists, Curators, and Archivists: Studies of their Work

The use of ethnographic methods by archaeology has a long history (Robin and Rothschild, 2002; Marcus, 1995), though it is only recently that the field has applied ethnography to studying archaeologists. Over the past decade, archaeologists have taken the "unusual step of turning the ethnographic method back onto archaeological practice itself" (Edgeworth, 2006: xi). Archaeologists have made use of the "creative extensions and expansions made by archaeological ethnography, in the perspectival shift from ethnographies focused on archaeological practice to broader scope accounts of archaeology's implication in issues or dynamics extending beyond archaeological practice itself" (Samuels, 2011: 152). Through ethnographic observation, archaeologists have been able to acknowledge how their own knowledge work and knowledge production is itself culturally produced. The resulting

transparency of practice may give to the field an opportunity to redress prior imbalances of perspective, magnify subaltern and othered voices, and open up the archaeological field to those environments previously ignored merely because they were "right here in front of our eyes" (Edgeworth, 2006: xv). Hamilakis (2011) argued that ethnographic methods reveal the dynamic nature of archaeology. My research extends this notion to understanding work practices carried out by a *range* of professionals – from field documentarians to lab directors – within the field of archaeology. Prior research also finds that archaeologists possess key "knowledge-based skills ... structured analysis, reasoned argument and careful presentation" (Darvill, 1995: 176). Archaeologists draw on these skills in implementing new research activities on excavations to understand aspects of the site history.

Museum studies, or museology, is an academic discipline that takes museums and their management as its object of study. The definition of museums provided by the International Council on Museums in 2006 (in Swain, 2007: 6) communicates their broad societal reach, as it declares that a museum institution, "in the service of society and its development ... acquires, conserves, researches, communicates and exhibits, for the purpose of study, education and enjoyment, material evidence of man and his environment." Museum studies is a rapidly expanding, though arguably young, area of research, having emerged in the 1970s (Latham and Simmons, 2014). Museum curators have infrequently been the subject of ethnographic studies. Pearce (1990) has written substantially about curatorship, particularly by analyzing how meaning is accorded to museum objects based on their role in someone's life.

Most ethnographic studies in the museum field have been situated within the realm of museum education, and show an outward-facing focus in their emphasis on visitor interactions, an area pioneered by Hooper-Greenhill (2006). Such research has observed visitors (vom Lehn,

Heath, and Hindmarsh, 2001), students (Wolins, Jensen, and Ulzheimer, 1992), and children (Ellenbogen, 2002). For museum curators today, skills such as collaborating, coordinating, and communicating with a museum's local community are often more desirable than subject expertise (Dewhurst, 2013; Krmpotich and Peers, 2011). Recent studies have explored how to construct and design exhibit content in a more participatory way. In Denver, two initiatives seek to elevate the role museums play in fostering civic engagement: the Collections Synthesis Project and the Indigenous Inclusiveness Initiative (Nash, Colwell-Chanthaphonh, and Holen, 2011). While museums have been engaged in other democratically-minded activities for over a century, recent work has renewed museums' attention to ensure that community voices are heard on their own and unfiltered. Yet as Cooper (2013) noted, there is still a preponderance of solitary projects such that both museum practice and the museum literature are bereft of paradigms with which to inspect the *process and outcomes* of actual collaborative experiences. Cooper discussed how the redesigning of the permanent Greek and Roman galleries at a university museum involved curators and classicists working collaboratively to tell particular stories by selecting and arranging individual objects (from a collection of around 6,000), and composing new museum labels. The exhibit labels mentioned both the people involved in their creation as well as the modern individual who had "re-discovered, collected, restored and displayed the object" (p.478), thus placing provenance on display. In the final analysis, this collaboration "brought issues debated in research in classical archaeology into the museum display, it also allowed university academics to consider the museum display as the public face of their academic discipline" (Cooper, 2013: 468). Yet even in this case study, the museum curator's skills and/or contributions to this project were left unexplored.

Researchers have studied archivists using ethnographic methods. As Gracy (2004) argued, such methods enhance our understanding of archival work by introducing the idea of individual communities of archival practice, a contrast to conceiving of archival work as a singular abstract. Yet archival ethnography is also a young area of research, with few studies examining professional archival work as a major focus. Most recently, Alcalá's (2016) innovative survey illustrates the methodological contributions realized in such work over a decade. Prior archival ethnographic studies have revealed valuable insights about how reference archivists (Trace, 2006) and film archivists (Gracy, 2004) learn their expertise. Reflecting the importance of understanding the context of creation of archival records, studies of archival record producers include those of radiologists (Yakel, 2001), biological scientists (Shankar, 2004), and architects (Decker, 2014). These studies ground archival knowledge in particularly detailed contexts of the creation and use of records. These studies showed me how data and data curation tasks fit into core professional responsibilities. Below I introduce some specific project structures in United States archaeological practice, including the stages of an excavation project and the relationship between contract and academic archaeology, issues I explore later in this chapter as well. Knowledge of these structures provides a sense of what is unique and not unique about my research sites.

Archaeological Projects and the Resulting Collections

Archaeological project management in the U.S., including contract, or cultural resources management (CRM) work, is structured by the guidelines of the Department of the Interior (1983, especially section 7, "Archaeological Documentation"). In particular, these identify

formal phases of archaeological work, which include evaluation of the project's goals and objectives at each phase to determine advancement to succeeding phases. U.S. landowners and builders must meet government requirements and pay for archaeological examination if archaeological site projects on the land are even partially federally funded. But landowners also control whether discovered sites can be placed on the National Register of Historic Places and receive federal protection. Project management also enjoys a rich discussion in the British archaeology literature that reflects the national policy frameworks codified in the 1970s, according to Andrews and Thomas (1995: 191). The Frere Report (1975) and the Cunliffe Report (1982) served an important role in informing the policies of English Heritage, the primary funder of archaeological work in England (where most archaeology is at least partially government-funded). Identifying distinct stages in archaeological work and specifying which documentation should be produced at each stage are the key goals of its 1991 document, *Management of Archaeological Projects* (MAP2). MAP2 employs the concept of a staged approach and planning principles in order to define five ordered, principal activity phases of archaeological work: 1) project planning, 2) fieldwork, 3) assessment of potential for analysis, 4) analysis and report preparation, and 5) dissemination. The fieldwork phase (2), which is most unique to the goals and specifications of the archaeological project, produces collected data that are usually not immediately ready for intellectual analysis. MAP2's phase 3 highlights the intermediate curatorial role that archaeologists should perform before they leave the field site. In this model, the archaeologist is tasked with producing an assessment report that captures the decisions made at this stage of the project, including "comments on the quantity and quality of the data in the site archive, a statement of its potential value for analysis and recommendations for the storage and long-term curation of that data" (Andrews and Thomas, 1995: 199).

The 1983 Department of the Interior guidelines and the Italian Law No. 1089 of 1939, which created the Superintendencies for Archaeology in Italy (Degrassi, 2012: 6), govern the research sites I will study. Still, the MAP2 model helps elucidate the concept of archaeological work stages – especially the fieldwork processes (phase 2) which are of key interest to my research. My study is concerned in part with exploring how the federal guidelines and requirements for collections care effectually shape the activities archaeologists carry out. Such a focus will attend to the contexts of decision-making and the considerations that archaeologists prioritize in making one decision instead of another. The three guidelines I have introduced here (American, Italian, and British) do not explicitly locate archaeological activities in any temporal boundaries (indeed time estimation and work rates are an under-researched area in the field, and I partially explored this topic at my research site #1), but rather each recognizes that activities occur under the time constraints inherent to archaeological work – especially those projects that are salvage or rescue operations.

The National Park Service recognizes that a wide range of repositories currently curate archaeological collections including the following six types of institutions: museums, academic repositories, tribal museums and cultural centers, historical societies, government repositories, and archives (Childs and Corcoran, 2000: s7.1). A paper by Sullivan (1992) serves as a cue that archaeologists are laying claim to the root meaning of curation (the care, protection, and preservation of archaeological objects), and based on her examination of legal policies Sullivan (1992: note 2) would grant museums a supporting role. Sullivan indicated that in spite of the supporting infrastructure in the form of the "federal preservation system," in 1990 fully one-third of states had yet to enact state-level curation legislation to care for non-federal collections presently in their care. Carnett (1991, Appendix) provided a useful chart of the state statutes

applicable to archeological resources protection as of 1990. More recently, Childs and Corcoran (2000: sec.3) continued: "By 1997, laws in 35 states mentioned curatorial issues and at least 20 states had curation policies and guidelines. Most of these curation policies closely follow 36 CFR 79." Nepstad-Thornberry et al. (2002), in providing further analysis and summarization of states' laws following federal legislation, noted that by 1999, 37 states were reporting improvements in their museums' accessioning practices, fee scheduling, and loan policies (see also Carnett, 1995; King, 2012; Sebastian and Lipe, 2010). Here, Sullivan is drawing archaeologists' attention to a history of somewhat lax practices of museums in accessioning stolen and looted archaeological finds. Sullivan's work shed light on this issue and helped elevate this overdue discussion of ethics within her discipline. Data for legislation implemented at the U.S. state level up to the year 1999 is obtainable through the State Historic Preservation Legislation Database, which launched in 1998.[2] A recent search of this database indicated that all 50 states plus Guam and Puerto Rico listed some legislation for the primary topic of "archaeological activities" in 2014. Still, this area is historically poorly covered by consistent survey data. Since it commenced in 2012, the Digital Index of North American Archaeology is endeavoring to integrate data from multiple state offices and deploy these datasets as linked open data (Wells et al., 2014).

Material culture scholars such as Olsen (2010) recognize that collections of archaeological objects have tremendous research potential. In order to make these collections accessible, archivists and curators perform several activities to provide intellectual access to

[2] See the report at "State Historic Preservation Legislation Database (1998-13)," *U.S. National Center for Preservation Technology and Training*, http://ncptt.nps.gov/blog/state-historic-preservation-legislation-database-1998-13/ and the database at http://204.131.235.67/programs/arts/statehist.htm. Note also the "State Submerged Cultural Resources Laws" database at http://www.nps.gov/archeology/sites/stateSubmerged/index.htm.

them. In the archival and museum fields respectively, these activities have traditionally been labeled as follows: appraisal (curation), acquisition (accession), description (cataloging), conservation, and finally a form or mechanism of public access (an exhibit often supplemented with a digital component). My study approached the museum setting with an interest in understanding and possibly visualizing (Sula, 2012) this workflow as it specifically concerns working with provenience and provenance data. Ultimately, a museum's purpose in carrying out these tasks is to sustain public interest in the archaeological enterprise, and this is achieved through museum exhibitions and the work of archaeological institutions (Cantwell and Rothschild, 1981).

While studies of curatorial work are limited, workplace studies have been carried out to understand phenomena such as technology failure, collaboration, and underutilization of employees and employees' capabilities (Garcia et al., 2006). In an essay on the changing role of museum archaeology, Barker (2010) employed the dimension of time to discuss separately the two museum-based activities around objects: curatorship and conservation. That is, while museum curators are concerned with depicting a conception of the past by using a particular representation of (chronological, evolutionary, sociocultural) time, conservation is focused on understanding objects' physical properties and optimal environments with which to "forestall [time's] effects" (Barker, 2010: 300). With his definition of "curation," Barker is suggesting that this practice does not belong solely to museum curatorship (and again, I will return to this very illuminating idea later). Such expansion of curation beyond museums is a crucial idea that permeates this study.

Archaeological curation is a professional activity realized in particular institutional contexts. Having explored prior ethnographic research of three professions (curators,

archaeologists, and archivists) and the settings in which archaeological projects and collections are assembled, I now turn to the institutional settings of museum archaeology practice. The below section explores why and how museums manage archaeological collections. I first outline the historical context of museum archaeology, and discuss two core concepts (provenience and provenance) central in their recordkeeping practices. I then explore the recent development of specific standards to manage archaeological archives (collections). I conclude this section with an analysis of the current status of the so-called "curation crisis."

MUSEUM ARCHAEOLOGY COLLECTIONS

The field of archaeology has developed around the study of human activity in the past. Archaeologists, its primary practitioners, endeavor to create new knowledge about past civilizations through the discovery and analysis of material evidence and remnants of the lived environment. Archaeological data, produced as an outcome of three primary activities (survey, excavation, and analysis), consist not only of artifacts but also of the supporting record generated in the course of archaeology (Galloway, 2006). The high volume of both objects and associated documentation reached a tipping point in the U.S. around 1970, and led archaeologists to declare these materials constituted a "curation crisis" necessary to confront. This section outlines the phenomenon's institutional context.

The roots of this crisis lie in the separation that began in the late nineteenth and early twentieth century between collections care and field research in archaeology. For a few decades, both the making and caring for archaeological collections had been accomplished under the same roof: public museums excavated and also displayed those excavated objects (Conn, 1998;

Willey and Sabloff, 1977). But in the early 1900s two shifts in the role of American museums contributed to the separation of collections care from basic archaeological research. First, museum administrators began to prioritize public education (and particular notions of culture) over funding research excavations. Some excavations found new sponsorship in college and university faculties.[3] We see one example of this shift in the career of Franz Boas, who left his museum administration post for a faculty position. In challenging earlier theories of race and social evolution, Boas developed a new concept of culture that could be plural, dynamic, reflective, and reflexive (Stocking, 1966). Boas identified four approaches to anthropology: cultural anthropology, archaeology, biological anthropology, and linguistic anthropology. Boas' contribution led to the establishment and uptake of both anthropology and archaeology as academic disciplines in university and college curricula (Christenson, 2011). Second, the increasing professionalization of both archaeology and museology resulted in the spread of archaeological work beyond oversight by one or more museums, such that the involvement of a museum did not occur until after excavations had concluded and an archaeologist submitted boxes of artifacts. Both the academic and the practitioner arenas of archaeology in the U.S. experienced a growth period during the 1920s-1940s. During the 1920s the U.S. federal government supervised many large-scale dam and reservoir, highway, canal, and other construction projects, and began supporting nationwide programs of "salvage archaeology" (for a historical account see Fagette, 1996). The Works Progress Administration (WPA) projects of the 1930s expanded salvage archaeology programs, which continued for some time after the end of World War II. Because much WPA work was federally-funded, the results and data from

[3] These include college and university museums, e.g. members of the Association of Academic Museums and Galleries.

these excavations were deposited in regional or statewide repositories, rather than at universities.

Major large-scale federal projects were carried out in the American Southeast, Midwest, and Southwest and each produced ever-larger quantities of excavated materials that flowed steadily into the rooms of an untold number of facilities, storage areas, and repositories. The passage of subsequent federal historic preservation laws and regulations came to create a "federal preservation system" consisting of Federal Preservation Offices, State Historic Preservation Offices, Tribal Historic Preservation Offices, and Certified Local Governments (Fowler and Givens, 1995). Key among these new laws was the National Historic Preservation Act (NHPA) of 1966 that over the next decades had the effect of establishing within the archaeology field a specific, now-flourishing sector known as CRM (Cultural Resource Management) archaeology. By the late 1980s most archaeology in the U.S. had come to be done by private companies under such contract to governmental bodies (Green and Doershuk, 1998). As McManamon explained, CRM's emergence was initially due to the increased importance placed on carrying out planning and impact studies as part of the launch of public projects, particularly those that might affect archaeological sites and other historic properties. McManamon (2005: 1239) stated that, "The results of these studies are used to determine whether sites should be avoided and preserved in situ or excavated before the construction to recover the data contained in the site."

In their history of archaeological curation in the United States, Sullivan and Childs (2003) characterized the period from 1970 to the present as one beset by a professional tension between "making versus caring" for collections. Watson (in Bentley, Maschner, and Chippindale, 2008: 32) noted that well over 90 percent of American archaeology today is CRM

archaeology (if one includes university archaeological field schools and research excavations that are CRM-funded). While most CRM practitioners have graduate degrees in archaeology, opportunities for their continuing professional education have developed largely outside of universities. Today, the mass contracting-out of archaeological activities by U.S. federal agencies to archaeological firms has resulted in a highly decentralized system of practice. Recent work has reconsidered how CRM could support a more culturist and holistic view of archaeological management (Agbaje-Williams, 2008).

The National Park Service, a U.S. federal agency, has served as a de facto leader in the area of archaeological repository management, by developing collections guidelines for states to implement; its *Museum Handbook Part II, Appendix E* outlines cataloging standards specifically for archaeological objects (U.S. National Park Service, 2007). As part of the U.S. preservation system, individual states enacted legislation governing archaeological records preservation through instituting a state archaeologist position and/or procedures for managing materials. Although a 1997 study of "state archaeology weeks" revealed that the State Historic Preservation Office (SHPO) serves in many states as the designated leader for archaeological issues, in some states this is not the case and other bodies play an important role in statewide activities, including "the state archeologist, a federal agency, an avocational society, a professional archeology organization, or a private contracting firm" (Greengrass, 1999). While Jennings (1985) took a broad national scope in his analysis, Johnson (2003) analyzed how work by one statewide professional community is based on museum concepts and also derivative of federal standards for archaeological collections. Today, Texas remains the only state administering an accreditation program for archaeological collections, though other states can

point to having curation standards on record (Butler, 2005; Johnson, 2000; Childs, 2016 Mar. 31 communication).

Archaeological museums today make special efforts to ascertain the provenance of the objects they acquire. Provenance, or object history, is powerful information that impacts our perceptions of art and archaeological objects, both in museums as well as outside of them. My research takes up provenance information at different stages of an object's discovery. One component of provenance information, as understood in this research, is archaeological provenience, which refers to a specific findspot in space. Both are important and distinct types of documentation but at least with physical, if not digital, objects, provenance information is neither assured nor easy to obtain without diligently drawing out an object's path across time and space. In the below two sections I explore both of these terms and their applications in archaeology and museums. I study the concepts here as a precursor to exploring how records *containing such data* might be constructed in archaeological recordkeeping practices. This conceptual knowledge is essential groundwork for the analysis presented later in the study.

Provenience Recording in Field Archaeology

A commonality between provenience and provenance is that both are types of information, empirical data that can be captured or logged, automatically or manually. Yet while provenance consists of the object history that museums and archives document, provenience data must be captured at the time the object is excavated from the ground; though such capture is done with varying resolutions, the most preferred is often the most specific: discrete events, associated deposits, or individual household units. That is, if provenience records an object's

findspot, provenance records everything that happened in its journey especially after this moment (study of the object before this moment generally constitutes archaeological research), including material analyses to determine the object's actual "birthplace." Joyce (2012: 56) who similarly illustrated these two terms with the idea of an object "itinerary," argued that even if archaeologists value provenience, and art historians are concerned with knowing or reconstructing provenance, "the object itself is more than any one of these descriptions." Joyce's examination of these concepts not only provides an art history perspective complementary to my own, but also supports the direction in which I aim to advance our understanding of them: by observing them in action in the field. Finally, I concur with the premise that while these concepts may be somewhat stable, their tools for instrumentation are assuredly not, which I take up as a research opportunity. Below I discuss the separate lineages and impact of both terms.

Archaeological provenience is concerned with the ways one determines relative or absolute spatial positions for objects in the field. Archaeologists once linked their 3D measurements to a master datum, or a permanent marker (e.g., in the form of a brass cap) located either on or off the excavation site. This datum was *linked* by azimuth and distance measurements to a geodetic benchmark or discrete topographic feature that is unlikely to be altered by natural or human forces (Glassow, in Maschner and Chippindale, 2005). Often in concert with a local datum, GPS data provide absolute latitude and longitude locations for day-to-day surveying purposes. Technologies have impacted how archaeologists make provenience observations, and one could study the evolution of provenience recording using several methods. A researcher could examine original fieldnotes from a sample of excavations by well-known

archaeologists.[4] Such a method is ideal but labor-intensive, and involves a fair amount of researcher interpretation and extrapolation, depending on the clarity of the notes.

One could also examine provenience information by viewing introductory textbooks written by practitioners of archaeology as a proxy for reflecting the history of archaeology, including the history of its core concepts. Previous research supports such a choice of method (Lyman, 2010). A third way is to examine the archaeological literature on field methods as well as some areas where the concept of provenience might be central to the research (e.g., the influences of paleontology on Paleoindian archaeology, of radiocarbon dating, and of associations between artifacts and ancient animal remains). Lyman (2012) employed the latter two methods in exploring the history of the concepts of provenience, association, and context. In particular, the third method reveals that archaeologists used the concept of provenience implicitly in early nineteenth-century work, but that the term did not appear until the late nineteenth century in academic publications. Early archaeologists such as Christian Thomsen, Jens J. A. Worsaae, and others recognized stratigraphic provenience in their work in the 1820s and 1830s. We know this because they carried out stratigraphic excavations – that is, they kept track of which strata produced which artifacts – and notes from their work reflect at least an implicit understanding of the concepts and importance of provenience and context. Association and context, notably, are separate but complementary terms that refer to the relationships between artifacts from a site. However there is a scarcity of notes available from the period of the early 1800s so to understand more, we must continue in time to the late nineteenth century.

[4] Bentley, Maschner, and Chippindale (2008: 1) suggest fifteen such founders in English-speaking archaeology: V. Gordon Childe, Walter Taylor, Lewis Binford, Kent Flannery, Patty Jo Watson, and Michael Schiffer, followed chronologically by Ian Hodder, Michael Shanks, Margaret Conkey, Michael O'Brien, Christopher Tilley, Kenneth Ames, Michelle Hegmon, Stephen Shennan, and Carole Crumley.

The first appearance of "provenience" in the archaeological literature was in Percy Gardner's 1884 article in *The Journal of Hellenic Studies* (based on a JSTOR keyword search) though usage of the term in Arthur J. Evans' 1892-93 article "A Mykenaean Treasure from Aegina" in the same journal attracted greater attention (according to the *Oxford English Dictionary*). Pitt Rivers' personal writings at the same time also urged archaeologists to record artifact locations (Stein, 2008: 109).

The concept of provenience has longevity: North American archaeologists in the nineteenth century made extensive recordings of stratigraphic provenience of artifacts. While geologist-archaeologists such as Sir Charles Lyell (1797-1875) and B.L.C. Wailes of Mississippi were well aware of the temporal significance of stratigraphy, Lyman (2012: 214) has argued that such an awareness may not have been widespread. Lyman suggests that the profession, writ large, did not believe the timeline of the American archaeological record was any longer than a couple of thousand years, effectively espousing the "short chronology." Such an understanding prompted little need to make fine chronological distinctions. Archaeologists also did not immediately recognize the existence of a cultural transition in America on the same order of magnitude as that of the Paleolithic to Neolithic periods in Europe. Consequently, its practitioners would not have been interested in deploying stratigraphic excavation to document cultural evolution. Finally, Lyman argues that these scientists did not make distinctions between the known prehistoric cultures of North America discovered archaeologically and those discovered ethnographically. These explanations all suggest ways of thinking that were dominant among archaeologists in the nineteenth century. Archaeological textbooks also reveal that the questions archaeologists wish to ask in their survey and excavation influence the course of their fieldwork and the data that fieldwork generates. That is, archaeologists have had a manifest bias

in finding answers to the questions they themselves pose. This has existed since the early 1840s, as demonstrated, again, by the work of Jens Worsaae. He undertook excavations of burial mounds to validate the Three Age System advocated by Christian Thomsen, who organized his museum by dividing the archaeological record into the three technical stages of stone, bronze, and iron (Steinberg, in Maschner and Chippindale, 2005: 79). Worsaae recognized that the proof for Thomsen's ideas had to come from the ground, and so he carried out extensive documentation of his excavations. The work of Edward Palmer in prehistoric Arkansas in the 1880's also demonstrates close attention to the provenience concept (Jeter, 1990, especially Chapter 4). Worsaae's explicit bias demonstrates an early instance of archaeologists adopting a scientific approach to documenting excavations, for the stated purpose of supporting their own claims about civilizations, especially once the excavation had destroyed the evidence.

Prior to 1960, archaeologists asserted that provenience was important (and left it at that), but after 1960 – as the textbooks reveal – they asserted that it was key to the determination of such ideals as "context," "culture history," "use and meaning," and "function." Asking what caused these particular ideas and phrases to emerge in 1960 brings us to the decisive paper published by Lewis Binford in 1962, "Archaeology as Anthropology," in *American Antiquity*. As commended by Watson (in Bentley, Maschner, and Chippindale, 2008: 30), Binford's paper boldly and declaratively presented the New Archaeology party platform. Binford's paper is a key locus around which the profession marked a real shift in "how it thinks." In the late 1970s and early 1980s, provenience took on the additional meaning of cultural context, thanks to Walter Taylor's propagation of the concept. Finally, two bibliographic illustrations highlight the degree to which the profession took up the concept of provenience. In Stein's (2008) sample of 33 archaeology textbooks, the term "provenience" did not appear with any regularity until the late

1970s; only 15 of these textbooks define the term and their mean date of publication is 1991. Lastly, the period from 1975-79 saw the peak appearance of the phrase "archaeological provenience" according to a study of articles in *American Antiquity* from 1935 to 1999 (Stein, 2008). Stein's analysis shows that archaeological practitioners were then using the term with more frequency than before, but as I have discussed in this section archaeologists have been applying, even if implicitly, the provenience concept for over 150 years. By employing this concept with such frequency in their writings, we can say that members of the field at least recorded provenience data as part of their investigations' methods, though the uses to which they put these data depended on their theoretical goals.

Provenance Research in Museums and Archives

The concept of provenance spans many subdisciplines in archaeology and the field of information. These include classical archaeology, art history, history (Kramer, 2014), bibliography (Kumar, Ujjal, and Utpal, 2013), science (Missier et al., 2012; Fear and Donaldson, 2012), computer science (W3C, 2010; Kim et al., 2008), and even social media (Barbier, Feng, Gundecha, and Liu, 2013). Yet here I highlight provenance's lineage in the archives field in order to illustrate archivists' normative goals with regard to establishing intellectual control of their (archaeological archival) collections. The French origin of this term is the concept of *respect des fonds*, which Natalis de Wailly of the French Ministry of the Interior first articulated in a "Circular no. 14" in 1841 (Bartlett, 1991; Sweeney, 2008). *Respect des fonds* is the principle that records of different origins (*fonds*) be kept separate. It differed from earlier practice, which saw archives classified by date. Having developed within the professional field of archives, the

historical beginnings and lineage of *respect des fonds* reflect its emergence in the mid-nineteenth century out of Enlightenment pursuits to develop universal codification systems for use by French provincial curators. de Wailly himself did not, however, intend that *respect des fonds* be applied to modern records created after 1800. Only with the establishment of a national school for paleographic studies in 1821, the Ecole des Chartes (Moore, 2008), and the hiring of its graduates by French local authorities did standardized archival practices of arrangement and description become widespread. The collective concern of the nascent archival profession for *respect des fonds* was for very practical reasons and reflected the day-to-day needs of ensuring that records survived the post-revolutionary period. A hypothetical debate pitting Henri Bordier, an archivist at the Archives Nationales who defended the status quo (arrangement by date), against Léon Laborde, a director there (1857-68) who promoted *respect des fonds*, might put the priorities of the day in stark relief. Bordier was unenthused by the principle, likely because of the amount of work it would involve (he saw the archives, accurately, as in a scattered state) while Laborde argued that erudite interests would be better served by reuniting like documents and reconstituting the history of the documents' parent establishment: "the value of an item can not be completely appreciated if one does not know its provenance" (Bartlett, 1991: 113). This scene highlights for us today the process by which actors within the archival profession planted the seeds of archival theory and moved forward the thinking about the relative advantages of provenance, which continue (Bearman and Lytle, 1985).

The archival profession (as represented by Euro-American archivists, more precisely) widely adopted the provenance principle following its introduction at the international archival conference occasioned by the 1910 World's Fair in Brussels (Gilliland-Swetland, 2000: 7) – where the Dutch Manual on arrangement and description was also made public in a French

translation, and brought back to the U.S. After the post-World War II reorganization of federal agencies, the U.S. National Archives assigned Theodore Schellenberg to undertake research surveying archival practices in several European countries, so as to inform American ones regarding archival arrangement. Schellenberg (1956; 1961) outlined four levels of arrangement that an archival collection might contain, all of which are informed by the two principles of provenance and original order. Provenance, as explained by Schellenberg, asserts that archives should be arranged (kept) according to their source, a strategy which supports the materials' evidential value.

Today the concept of provenance remains as vital to the archival discipline as in Schellenberg's day, and we see it continuing to impact the daily work of archivists and the work of arrangement and description. Archivists today who have moved to a post-custodial model (one which does not rely on physical ownership) – as discussed generally in Cook (1993) and with specific examples in Caswell (2014) and Bastian (2001) – address the complexities that arise when provenance is unclear, contested, or in any electronic form. Some archivists are also concerned with parallel provenance, which identifies more than one source origin (Hurley, 2005). Bastian (2001) illustrates contested provenance in the case of the records of the former Danish colony, the U.S. Virgin Islands: Danish archivists first removed the majority of records created in the U.S. Virgin Islands during colonial rule and deposited them in the Danish National Archives upon the U.S. purchase of the Islands from Denmark in 1917; then, an archivist from the U.S. National Archives claimed the remaining records and shipped them to Washington. In Bastian's analysis, this ultimately left much of the native population without access to the written sources that hold their collective history, and her synthesis argues that a post-custodial management practice might help redress the limited access these records creators have and

would evince support of the principles of peoples' rights to records in a globalized context. Archival provenance is also complicated by the digital materiality of records, as observed in bit-level processing (Bailey, 2013), as opposed to the tangible visibility of writing on paper.

The concept of provenance continues to shoulder inordinate weight in shaping the modern archival discipline. Since 1840, "provenance research" has encompassed efforts to understand not only archives' moment of creation, but also the histories, trajectories, and processes the objects have coursed through over their lifecycle in order to arrive in their present condition. Provenance research in museums, also, builds on this tradition and seeks to uncover a full accounting of the total custodial history that is a part of an object. Events over the past two decades have reinvigorated this activity as a professional practice in art and archaeological museums. These include the passage of NAGPRA, the National Park Service's 1990 standards, the work of the Society for American Archaeology (SAA) Committee on the History of Archaeology, new collaborations fostered between archivists and archaeologists (Kenworthy, King, Ruwell, and Van Houten, 1985), and new funding opportunities for collections management such as the National Science Foundation's (NSF) Systematic Anthropological Collections Program, ca. 1978-1992 (Greene, 1985; Sullivan, 1991).

Research on object provenance, which I understand as a core part of archaeological curation, is fundamentally connected within the discipline of archaeology to the illegal antiquities trade. Archaeologists have been seriously concerned with provenance issues since the early 1990s when major illegal antiquities and forgery cases arose out of Italian, Turkish, and Latin American claims to looted objects. Accusations about the Getty Kouros led to the discovery that its provenance was forged, which led to major questions about its authenticity (Chippindale, 1996). Publication of the Morgantina silver by a curator at the Metropolitan

Museum of Art in 1984, with only vague details given as to the provenance of these objects, spurred the first of many proposals that the museum return the silver (Bell, 2002: 202). The claims were substantiated by excavations carried out in 1997 and 1998 that pinpointed the provenience of the looting to two holes found in the floor of the house on site that could be dated to 1978 (Steele, 2000; Singleton, 2006). The provenance of the Euphronios krater, the acquisition of which had involved the same Metropolitan curator, was also revealed to have been deliberately withheld – even misrepresented. The museum agreed to repatriate the krater, silver, and other objects to Italy, where they went on display in the town of Aidone just outside of the Morgantina site in 2010. The Getty goddess statue was one of forty objects returned to the same town after a long period of negotiation, a story told in *Chasing Aphrodite* (Felch and Frammolino, 2011) and part of an emerging history of a passage of looted antiquities through Switzerland to dealers in Europe and North America (Gill and Chippindale, 2007). Frammolino (2011) notes that over five years, American museums returned to the Italian and Greek governments more than 100 artifacts worth nearly $1 billion. Yet the provenance discussion is not limited to big museums; both smaller-size museums (Tsirogiannis, 2016: 201) and looters of tribal sites (Lunday, 2006) have been implicated as well. Provenance issues are now part of the mental landscape of all museum administrators.

Under the terms of the 1970 UNESCO Convention, objects for sale must have documentation of provenance and their collecting history, or the objects can be repatriated to their country of origin if evidence of illegal looting is found. Yet illicit trade continues today and museum curators now expend more hours researching the provenance of objects than they did thirty years ago (Reed, 2013). Findings emerging from quantitative research studies of antiquities collections reveal not only immense gaps in documentation but also point to a history of

deliberate ignorance of provenance research between the 1970s until the early 1990s – because administrators knew they were purchasing looted objects – when public claims forced museum administrators to react (Chippindale and Gill, 2000). Legislation related to the post-World War II legacy of looted works of art across Europe and the Americas has also reinforced this attention (see Renfrew, 2000; Brodie and Walker Tubb, 2002; and Luke and Kersel, 2005). As a specific outcome of the Presidential Advisory Commission on Holocaust Assets in the United States, the American Association of Museums adopted Guidelines Concerning the Unlawful Appropriation of Objects During the Nazi Era (AAM, 1999/2001). Institutional museum programs that have been launched to research the provenance of objects in their collections take a broad view of provenance research, being concerned mainly with discovering whether antiquities have been illegally excavated, sold, or have forged documentation (Chippindale, Gill, Salter, and Hamilton, 2001). Lapatin (2002), who disassembles the story of a gold and ivory "Minoan" statuette as one created in the early twentieth century, shows how forgeries can manipulate the historical record and cause intangible damage regarding trust. Archaeological museums' programs have taken many forms, including the creation of portals that display provenance data online, and in the case of Art Tracks, of required data elements for expressing provenance (Berg-Fulton, Newbury, and Snyder, 2015). Michael Joyce developed the hypertext authoring program StorySpace with two colleagues, and archaeologist Rosemary Joyce used it to create historical networks around objects (Tringham, Shanks, and Witmore, 2013: 329). Li and Sugimoto (2014) described how provenance descriptions should follow standards that have been established for digital preservation (PREMIS and OAIS) by integrating particular metadata elements as they would be integrated into these ontologies. They build on earlier work which created a data model for expressing assertions about the characteristics of metadata, including its provenance (Eckert,

Garijo, and Panzer, 2011). Provenance research now necessitates that museums make their collection documentation open and organized (Karrels, 2014). Through opening up such data for public access, important discoveries have been made and museum staff still expend significant resources (in the vein of genealogical work) in resolving and tracing some of the more knotty restitution claims. Provenance research is an increasingly high profile activity in museums that continues to accommodate new applications in digital environments. In the section below I explore an early application of archival principles to archaeological collections that has some promise as a future strategy towards ameliorating the "curation crisis" I will explore next. The purpose of this section is to illustrate an example of ongoing conversations regarding curation and archives within archaeology.

Archaeological Archival Standards

The recent appearance of collaboratively-authored archival manuals specifically for archaeological archives (Brown, 2007/2011; Sustainable Archaeology, 2013; Perrin, 2002a) indicates a heightened awareness of professional responsibility and ethics on the part of modern archaeologists and information professionals. The archaeological community itself also recognizes the expanding ways in which archives can construct archaeological knowledge, including conceptual ideas, as seen in a special "Archive Issue" of the *Archaeological Review from Cambridge* (Baird and McFadyen, 2014). One of these community efforts focuses on developing resources for more optimal physical management and description of artifacts. In the United Kingdom, the Archaeological Archives Forum (AAF) was formed in May 2002 in response to a report submitted to English Heritage, *Archaeological archives: Documentation,*

access and deposition: A way forward (Perrin, 2002a; 2002b), which advocated for such a body. Since its establishment over a decade ago, the AAF has provided archivists a unified voice for promoting further public support toward these archives (including archaeological maritime archives), whether accessioned or as-yet undeposited in an archive, and to develop and publish best-practice guidebooks for managing them.[5] Its membership consists of designated representatives of the major stakeholder organizations involved in archaeological archives in the United Kingdom. Recently, a Society of Museum Archaeologists (SMA) survey exposed a lack of storage space and curatorial expertise among 134 English museums dealing with archaeological archives (Edwards, 2013). Edwards' report served as impetus for a meeting of the AAF held on 7 March 2013, which resulted in an enhanced set of main recommendations. The report was part of a long-term survey, conducted jointly by the SMA (now Society for Museum Archaeology) and the Federation of Archaeological Managers and Employers (FAME), of organizations that accept archaeological archives for deposit; the resulting interactive map is hosted by the Archaeology Data Service (ADS).[6]

The Institute for Archaeologists (IfA), also in the U.K., adopted in 2009 the "Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives," an initiative of its component Archaeological Archives Group (Institute for Archaeologists, 2009). This document defines archaeological archives as "all parts of the archaeological record, including the finds, samples, and digital records as well as the written, drawn and photographic documentation." Comparable standards in the U.S. may be found,

[5] "Archaeological Archives Forum," http://www.archaeologyuk.org/archives/

[6] "Archaeological Collections Areas Database and Map," *Archaeology Data Service*, http://archaeologydataservice.ac.uk/archives/view/sma_map/

among others, in work by the Register of Professional Archaeologists (ROPA, previously SOPA), the first organization to address curation and professional standards in its "Standards of Research Performance" issued in 1981. These standards were motivated by the need in the U.S. to encourage owners to deposit their materials (at least eventually) for public good because anything otherwise could be labeled as looting (see, e.g., McGimsey, 1972).[7] These standards directed the "research archaeologist" that "specimens and research records resulting from a project must be deposited at an institution with permanent curatorial facilities, unless otherwise required by law" (Childs and Corcoran, 2000).

Both Pearce (1997, in Swain, 2007: 91-92) and the IfA standard identified diverse possible originating sources for these archaeological archives. While the six categories identified by Pearce include those collected privately, by agreement, or by chance (metal detection, among others), the IfA standard focuses more closely on those archives generated programmatically (delineating 22 types of elements that "should be compiled" as part of the archive). In America, while national surveys have been conducted on archaeological archives, the level of action (and standards development) has occurred at the state level, as discussed in the previous section (see Fitzhugh, 1977; Paschall, 2010). These surveys include the "Lindsay study" of 1979 (conducted by the American Anthropological Association under contract with the Heritage Conservation and Recreation Service), the 1987 review by the U.S. GAO, and one sponsored by the Council for Museum Anthropology (Ford, 1977; and Sullivan, 1992). Silverman and Parezo's (1992) volume captures perspectives from multiple disciplines voiced at an initial conference which laid

[7] See for example, Arkansas' Archaeological Training Program for an example of an approach taken towards "collectors", http://arkarch.org/index.php?pages/trainprog

foundations for both the non-profit Council for the Preservation of Anthropological Records (CoPAR), and for subsequent workshops.

Like the Perrin (2002a) and Edwards (2013) surveys, both of which triggered immediate action, Ottaway (2010) and Tindall (2012) conducted regional surveys of museums' capacity to preserve archaeological archives, in both cases in England, where museums are accredited by the Museums, Libraries and Archives Council (MLAC). There may be few if any parallels in the U.S. apart from the its collections management policy reference guide written by the American Alliance of Museums (AAM, 2012). Sullivan and Childs' *Curating Archaeological Collections* (2003) is considered the informal professional standard. Research is ongoing in the areas of archaeological archival description and data management, as seen in the Swedish ARCHES and U.S. ArchaeoCore projects (Swedish National Heritage Board, 2013; ARLIS, 2013; VRA, 2013; University of Virginia, 2013). Although funding challenges impact many sectors of archaeological work, archaeological archives have an important role to play in the preservation of cultural heritage. The problem of how to manage archaeological collections has been taken up by archivists, as we saw in this section. More importantly, however, archaeologists have exhorted their own community of practice to recognize the enormity of the "curation crisis" archaeologists have created over decades. In the two sections that follow, I explore claims in the literature regarding some of the causes and initiatives of this major issue. This discussion establishes a scope of the current problem space that extends beyond the cases in my study, and gives a broader purpose to my research that I further specify in Chapter 3.

The Curation Crisis

In recent decades, professional trends in archaeology and legislative measures have combined to call forth renewed attention to the issues compounding collection management in public repositories. Professionals and funders recognize more fully an ethical responsibility to properly curate, catalog, and provide continuing, perpetual access to archaeological materials post-excavation. The archaeological profession has challenged itself to take stock of the voluminous quantity of archaeological archives that are languishing in the custody of local governments or are otherwise undeposited. The owners of these materials lack sufficient funding to carry out much-needed conservation, interpretation, and exhibition (U.K. Museums and Galleries Commission, 1992; Brown, 2007). So widely recognized is this issue in the United States that it earned the disciplinary moniker of "curation crisis" in the 1970s, and remains a frequent topic of debate and discussion (Marquardt, Montet-White and Scholtz, 1982; Childs, 1995). At the turn of the millennium, the neglected role of archaeological archives *within its own field* was highlighted anew in a British research article that began to probe this problem space with depth and focus. Although they focus geographically on the U.K., Merriman and Swain (1999: 262) provided a baseline for understanding the makeup of archaeological archives within the field's dominant CRM model of practice. Merriman and Swain also challenged the profession to address "deeper structural problems" related to the management of data in archaeology. The task of generating a complete set of excavation records has been more than just important for archaeologists to do; it has conditioned archaeologists to generate large amounts of data which make demands on physical space and curatorial expertise.

At the same time, there is no clear path between these archaeological archives and a museum curator. In practice (in the U.S., Scotland, and Wales), it is common for the

documentary records to be deposited in an archive and the objects in a museum (this was the case in my first research site, especially for digital records in digital archives). The separation of objects from their documentation exacerbates problems in describing one without the other at hand. However, in England, Merriman and Swain's (1999) research has argued the benefits of adopting a "unified archive" approach (an archive of both documents and objects) – an argument that also finds support in prior policy-oriented studies which examine the curation crisis to develop nationwide guidelines, such as in Canada (Winter, 1996). Yet unified archives have proven to be an elusive target in the United States, where unlike in many European countries, there does not exist a national and regional museum infrastructure. Instead, the management of archaeological archives and objects, which I will call collections, is left to each state. Below I discuss federal and state regulations concerning the management of archaeological collections.

The role of federal policy in governing what happens with archaeological collections in the U.S. is quite important, so a brief summary of federal historic preservation laws that have been enacted in the United States during much of the twentieth century is presented here. A more extensive overview can be found elsewhere (U.S. National Park Service, 2006; Phelan, 1993). The Antiquities Act of 1906, recognized as the first major U.S. law addressing archaeological resource preservation, was passed in reaction to rampant looting and amateur destruction of sites, particularly in the American Southwest and Texas (Childs and Corcoran, 2000). After the Antiquities Act, the Historic Sites Act (1935) declared a U.S. federal policy to preserve historic and prehistoric properties of national significance. The National Historic Preservation Act (NHPA, 1966, with amendments in 1980) established a U.S. federal policy of cooperation with other nations, Tribes, States, and local governments to protect historic sites and values – from this came also provisions for enforcement by the respective State Historic Preservation Officers

(SHPO).[8] The National Environmental Policy Act (NEPA), passed in 1970, requires environmental protection for archaeology, by mandating that federal agencies prepare environmental assessments, impact statements, and alternatives. Historic and archaeological data came under the legislation of the Archeological and Historic Preservation Act (AHPA, 1974, which amended the Reservoir Salvage Act of 1960). The Archaeological Resources Protection Act (ARPA, 1979) introduced for the first time the first significant criminal penalties imposable for the vandalism, alteration, or destruction of historic and prehistoric sites on Federal and Indian lands. Finally, the cumulative frameworks of the NHPA, the AHPA, and the ARPA required the promulgation of Government-wide regulations for the curation and care of federal archeological collections, and these were issued in 1990, as discussed in the following section. For an overview of the legislation enacted in each of the 50 states with regard to burial sites, see the U.S. map produced by the National Association of Tribal Historic Preservation Officers.[9]

One of the cumulative effects of the passage of so many federal laws for protecting archaeological resources, as occurred during the twentieth century in the U.S., continues to be increased volume for repositories that accept the collections. The size of these collections has been exhaustively quantified by several reports prepared by the St. Louis-based Corps of Engineers Mandatory Center for the Curation and Management of Archeological Collections – in particular the Department of Defense (DoD) East and DoD West Collections Assessments led by Michael Trimble (Anderson et al., 2000). Childs (1995) also discussed comments from a

[8] The U.S. Presidents under whose administrations these key legislative measures were passed are Theodore Roosevelt (Antiquities Act), Franklin D. Roosevelt (Historic Sites Act), and Lyndon B. Johnson (National Historic Preservation Act). For a historical review see Jameson in Merriman (2004).

[9] "State and Tribal Laws and Regulations," *National Association of Tribal Historic Preservation Officers*, http://www.nathpo.org/State_Laws/State_Laws_Map.htm

curator who notes that once a museum has been selected by an excavation director and made public, the post-excavation period sees an increased number of both loan requests and reference inquiries made to that museum by visitors, students, and scholars. However, the many legislative measures documented above have not always been accompanied by increased funding directed towards the repositories housing the materials, and significant attention began to be paid to this problem in the 1970s and 1980s. Childs (2004) details how an "archaeological curation crisis" in the U.S. developed over decades, and was exacerbated by the surge of CRM projects beginning in the 1970s. The "Lindsay study" of 1979 examined the care and management of archaeological collections that were recovered from federal lands and now housed in a broad range of cultural institutions (Lindsay, Williams-Dean, and Haas, 1979), and shone new light on condition realities. In one sense, the laws served to highlight the past history of care as applied to archaeological excavation artifacts – and revealed that such histories were often spotty at best. The U.S. Army Corps of Engineers, for example, estimated that between 1975 and 1990 it spent approximately $165 million on archeological projects while spending next to nothing on subsequent curation of the resulting remains and records. Collection volume at the Arizona State Museum at the University of Arizona, for example, swelled from 950 standard archival boxes (1969) to 8,624 boxes (1989) to 17,248 boxes (1999), an increase of five-fold over just 30 years (Childs and Corcoran, 2000: s2.4). As a final example, the Forest Service estimated that 90% of its collections are housed under arrangements with non-federal repositories, many receiving little or no compensation or aid. While the causes of this exponential growth in acquisitions are not specified, the rise of CRM archaeology on a national scale is suggested as at least a partial cause.

Current State of Archaeological Curation

These stories and more were made evident in 1987 when the U.S. Government Accountability Office published *Cultural Resources—Problems Protecting and Preserving Federal Archeological Resources* (U.S. GAO, 1987). This publication, which gathered assessments from 30 non-federal repositories housing collections for three government agencies (Bureau of Land Management, Forest Service, and Park Service) has been recognized as a call to arms over the growing curation problem (Childs, 1995; Sullivan, 1992). Over 300 parks and centers in the U.S. National Park Service manage museum facilities, with emphasis on preservation, yet it was not until October 1990 that the Service issued curation regulations, in the form of 36 CFR Part 79 [title 36, chapter I of the Code of Federal Regulations, amended with the addition of part 79], *Curation of Federally-Owned and Administered Archeological Collections* (Sullivan, 1992; preceded by U.S. Department of the Interior, 1983 rev. 1991). With these regulations in place, now all museums receiving any federal funds were required to inventory their holdings and act accordingly. Just a month later, the enactment of the Native American Graves Protection and Repatriation Act (NAGPRA) heralded a new cross-museum focus on repatriation, as well as compliance and self-assessment more generally.

The Park Service's regulations continue to be the major guiding force in the management of archaeological collections for repositories across the United States, and they govern much of the stewardship practiced by statewide repositories. In addition to these regulations, the federal government also responded to the problem of collections accumulation by establishing the National Archaeological Database (NADB) in 1984. The purpose of the NADB is to share archeological information about publicly sponsored investigations and it does so through its three current modules: Reports, Permits, and Maps (Childs and Kinsey, 2004);

originally it was also intended to corral the grey literature produced for federal agencies by the CRM community in the form of project reports.[10] These efforts indicate progress in improving collections management practice on a number of fronts, including a revamping of cataloging and curation workflow at the National Park Service (funded by Congress in 1988), and the launch of a museum property program and a two-volume preservation handbook at the Department of the Interior (U.S. National Parks Service, 2007; U.S. Department of the Interior, 1983/1991; Childs, 1995).

In addition to federal government efforts, professional groups in the archaeology field have also responded in force to the "curation crisis." Archaeologists began to sound this alarm in April 1979, when a symposium was held, "The Curation of Archaeological Collections," at the Society for American Archaeology's (SAA) 44th annual meeting in Vancouver (Novick, 1980a). The SAA leadership in 1991 launched a Task Force for Curation, which submitted a report to the SAA executive committee in January 1993 titled "Urgent Preservation Needs for the Nation's Archaeological Collections, Records, and Reports." SAA leaders constituted an Advisory Committee on Curation which returned after twenty years to the curation issue with an elevated tenor, hosting the conference symposium "The Crisis in Curation: Problems and Solutions" in Philadelphia in 2000 (Bustard, 2000; Childs, 2001). The Advisory Committee submitted its report, "The Archaeological Curation Crisis: An Integrated Action Plan for the SAA and Its Partners," in March 2003. Of note, this report encouraged archaeologists to interrogate rooted views in the field against the practice of deaccessioning excavated materials, and it advocated the promulgation of deaccessioning regulations by the National Park Service

[10] The National Archaeological Database (NADB) is accessible from http://www.nps.gov/archeology/tools/nadb.htm

(Mullins, 2013; Chase, Chase, and Topsey, 1988). (Still, the NAGPRA legislation superseded any such actions on the part of archaeologists where Native American burials are concerned).

Two recent education-specific activities include a well-sponsored workshop which addressed national curricular reform in archaeology, and a book, *Teaching Archaeology*, published in 2000 – neither of which contained more than a meager discussion of curation education (Bender and Smith, 1998; 2000). Both Caldararo (1987) and Bustard (2000: 14) have raised concern over this absence of curation and collections management topics within archaeological curricula at the undergraduate or graduate levels. As Bustard noted, "It is as though archeologists collect things and then the objects disappear into another realm of responsibility." Additionally, there are several *styles* of curation and excavation within archaeology which ultimately impact the final disposition of the physical collections and fieldnotes, respectively. Only through greater involvement in the curation process by archaeologists themselves will the profession be able to ameliorate the continuing crisis in managing its own materials.

The aim of this review chapter has been to identify key concepts and the institutional background of the curation crisis as key phenomena, and to illustrate the existence of related federal guidelines. Through this chapter I am more able to understand any gaps between the literature and professional archaeological practices that may be revealed during the course of this research project. In the next chapters I will begin to discuss not only archaeology in the United States, but archaeology done abroad, which is subject not to U.S. federal guidelines but to rules of the host country. I note that in that context, gaps between practice and U.S. federal guidelines are not as relevant. As I transition to a more applied discussion below, it is worth observing that while there are many guidelines, there are neither robust theories which inform curation practices

(in crisis or otherwise) nor much scholarly dialogue spanning the records management and archaeology professions. Instead of developing theory around the curation issue, much of the professional archaeological literature has gravitated toward grappling with questions of particular levels of policy (especially within the U.S. National Archives and the National Park Service, respectively), and descriptive analysis. One contribution of my work will be to employ ethnographic research methods to study museum curators and their colleagues in curation, and to establish a foundation for developing new strategic approaches and insights for curation as a work process in archaeology. In the next chapter, I will establish the relationship between an archaeological field site and a museum, but I argue that most museum scholarship has not explored what happens at such field sites. Rather, scholars in museum studies approach archaeological collections with collection-specific questions rather than the interest I will articulate around multiple sites. It is necessary to integrate these two perspectives in order for us to bridge the handoffs that occur when each community creates different kinds of data.

3. Research Purpose

The purpose of this research study is to understand archaeological curation through examining documentation about objects. The research is designed to identify points of transition and change in object-handling procedures (from a field site to a museum) and the particular contributions of different experts to curation work. In this section, I further detail this core purpose, first by arguing that curation is a multi-sited activity. This section enhances the impact of my findings by discussing what provenience-recording activities occur at field sites, museums, and points intermediate and showing how all of these contributions are complementary. Second I maintain that documentation about objects forms the basis of subsequent provenance research, and my analysis of documentation will reveal the needs of different actors for particular data, possibly about object provenance. Whereas curation has not been intensively studied ethnographically as a connected pursuit from field to museum, my study will illuminate the gap between ideal procedure and on-the-ground practice, with the intent of analyzing whether certain data lose their usefulness beyond their site of creation. The dissertation findings are presented in the context of ongoing discussions in the museum studies field about curating, managing, and presenting archaeological collections. Third I explain the important role of museums in communicating archaeology to the public. Museum exhibits that include photographs and other data from excavations will help more people understand what archaeologists do, and I contribute to museum scholarship in support of this ambitious goal. I conclude this section with a brief reflection on my experiential motivation and continuing interest in this topic.

CURATION AS A MULTI-SITED NARRATIVE

This research defines archaeological curation as "an integral element of the archaeological process [that] refers to the long-term management and preservation of archaeological materials and their associated documentation" (Society for Historical Archaeology, 1993). In this study I am parsimonious about how I apply the term, using it to refer to a span of activities *leading up to* public object exhibition in a museum. My study will explore what actors are performing this work. While there exist many guidelines and regulations concerning proper curation practices, nearly all are limited to activities that occur *inside a repository*. My research seeks to contribute a more detailed understanding of activities that happen before objects reach a repository. I will be able to depict this path by taking a multi-sited and multiple-participant approach to my data collection.

Until the eighteenth century, archaeologists only viewed artifacts, and not their associated records, as worthy of preservation. Only fragmentary records remain of the restoration efforts performed upon archaeological finds prior to the eighteenth century, as it was only then that a desire for scientific analysis of the finds supplanted rampant modification of finds according to one's personal tastes at the time (Hulmer, 1955). A spate of international conferences held at the turn of the twentieth century and the pioneering work of Cardinal Ehrle, keeper of the Vatican Library and promoter of the International Conference of St. Gallo on preservation of archival materials in 1898, helped elevate scientific analysis within restoration and the study of paper (Caldararo, 1987). It was not until the nineteenth century that archaeologists for the first time began to expand what is meant by the "archaeological record" to include provenience documentation, ecofacts, analytic documentation, administrative

documentation, and project reports (Fowler and Givens, 1995; Novick, 1980b; Caldararo, 1984-5).

These forms of documentation began to accompany the artifacts through such techniques as writing or inscribing directly onto the objects, writing information on object containers (bags, boxes), and creation of the museum registrar profession, also during this time. I argue that these writing practices, despite their treatment in curation guidelines, are poorly understood. One exception is the attention given specifically to the federal guideline 36 CFR Part 79 (just introduced in Chapter 2) in a growing CRM literature, for example in *Cultural Resources Archaeology: An Introduction* (Neumann, Sanford, and Harry, 2001), which discusses the role of peer-review in ensuring curation compliance. Because they occur outside of the museum, field site practices have not been well-researched by museum scholars, even though the transition points in an object's journey to a museum determine future uses of the data. For an example of such a transition point, if excavators fail to record an artifact's provenience data, a museum curator examining this artifact some time later for possible accession or exhibition will dismiss the artifact from consideration in the absence of provenience data. Or, if conservators do not extract eighteen objects confined in a single concretion, a collections manager will prepare an inappropriate storage environment that further degrades this material. Each of these transition points must be executed correctly in the lead-up to exhibiting and curating artifacts in a museum. Previous museum scholarship has been limited to single museum sites and has not fully articulated curation as a multi-sited phenomenon (Geiger and Ribes, 2011). A better understanding of how and why archaeologists perform, structure, and organize this work might make it easier for curators to manage provenance issues and maintain appropriate documentation. Through my observations and questions, I will be able to discover (and

subsequently analyze) the decisions archaeologists in my study make regarding the creation and disposition of all of their data generated in the field – including notebooks, photographs, context sheets, and site reports, as well as conservation documentation, accession records, illustrations and feature drawings. Each of the research sites I have identified – from field to museum – creates different documentation to capture information about the artifacts, and in the following section I highlight why we should include these data in archaeological curation's scope.

CURATING OBJECTS: FROM FIELD TO MUSEUM EXHIBITION

The preservation of archaeological archives is challenged significantly by the very nature of archaeology, for it is an inherently destructive activity. Because the records produced from excavating are the result of a destructive process, these records become the only evidence for what has been observed. For this reason, archaeological recordkeeping is of paramount importance within the profession, and is highly specialized. Bowker (2008: 122), among others, has argued that recordkeeping practices are just as important for any researcher to understand as are the published papers that result from using these records (lab notebooks, local databases). Flinders Petrie (1904: 48) put it more bluntly: field recording constitutes "the absolute dividing line between plundering and scientific work, between a dealer and a scholar." Excavation records that facilitate recognition of stratigraphy, soil layers and their morphology, give sequence to a site that the archaeologist can interpret as a narrative of past human activity and behavior. It is difficult, if not impossible due to the destruction, to do so without such records. Several scholars have considered the implications of 'preservation by record' for both traditional publication and digital archiving in archaeology (Humphreys, 1973; Carroll, 2008; Limp, 2005), in cases where

only records *of objects* exist, and not the objects themselves. Archaeologists also encounter and study other kinds of organic material, referred to by some scholars as ecofacts and naturefacts (Malina and Vašíček, 1990: 152). As a discipline, archaeology is unique precisely because it "is visual, it has cultural content and is, usually, data rich" (Aldred, 2005). Archaeological artifacts are complex objects, and determining exactly what constitutes the *data* of archaeology depends on the potential user and their interests.

In designing my study, I recognized that the formation processes and paths for artifacts and for documentation are very different, as a result of historical thinking about the archaeological process (Kingery, 1996: 11). In some archaeologists' view, artifacts belong with an institution, but fieldnotes, and often photographs, are personal possessions – a stance that crucially impacts the disposition of each. I sought to observe and analyze the basis for making these decisions in the field. I found that these decisions are not only a matter of personal preference, though that is very relevant, but also a product of the participant's navigation of a series of professional norms and project constraints. The participant's relationship to the archaeological activity (whether as volunteer, director, or employee), the quality and format of their data (whether paper or digital or some combination), and institutional procedures all shape the decision to create and share data. The occupational lens I pursue in this study examines such professional norms from the perspective of my participants.

Studying museum records and fieldwork records in combination affords unique research opportunities. Museum records can facilitate "predictive models, historic contexts, and meaning from archaeological findings" (Crowell, 2000: 97). They are also useful beyond these kinds of research particularly when the original archaeological sites are destroyed, consumed by development, or otherwise unavailable for return excavation visits (Galloway, 2000). Brysbaert

(in Dudley et al., 2012) further examined techniques employed in archaeological museums for displaying and representing people's connections to their everyday objects. This work has real implications for understanding whether museums are fulfilling their mission and meeting the needs and desires of visitors.

MUSEUMS AS A WINDOW INTO ARCHAEOLOGY

Museums have functioned historically as the public arm of academic archaeology and their activities today provide insight into the current maturity of this field. Museum archaeology has been defined as "the dynamic way by which archaeologists participate in how objects are displayed and shared with the public in museum settings" (Swain, 2007: 12 quoted in Morales, 2011: 5). Museums, I argue, function as a window through which the public interacts with archaeological practice. In *The Mangle of Practice*, Pickering (1995: 3) drew attention to "the material and social dimensions of science"; while his emphasis is on the intentions and practices of scientists, this idea can be applied (tenuously) to museum work. Pickering further argued that human-made objects, especially tools, "capture agency" to extend human capabilities. Accepting the situatedness of artifacts as a theoretical premise, my investigation of archaeological curation does privilege "the role of the material world in the production of science" (Collin, 2011: 148) in examining physical objects. My choice to examine curation work through close material study of documentation reinforces a view of it as something constructed – neither a universal nor a wholly scientific process. Both experts and non-experts have parts to contribute, as Alberti (2005) contended. This study does emphasize curation work as a reflective practice and one which is impacted by the decisions, priorities, and pressures placed on the actor. In my research

design (detailed in the next section), the documentation I observed at the field site was not the same documentation I observed at the museum and collecting repository, but the selection of each site allowed me to see the curation process unfold. I acknowledge the intervening periods when the documentation is not in use, noting that it would take a different kind of retrospective research design to be able to understand "in hindsight" the reasons for such periods of non-use for a singular object. I kept the focus of my analysis on potential use for these data, especially their use by curators to design an exhibit. This use was of particular interest because it allows me to connect my curation work analysis to its possible outcome in the museum experience.

Museum exhibits express a curator's interpretation of a particular human environment. I situate the work of the curators I observe by attending to the resources and technology they utilize to carry out such work (from guidebooks to databases to colleagues) and the pressures they negotiate. Exhibit curators are concerned with "representational practices" (the art of exhibit design), which add to the evidential layer of historical documents an additional layer of understanding regarding their social production: their creator, provenance, owners, handlers, and manipulators. While Voss (2007) applied this notion to historical archaeologists' work, I apply it to curators' work. By accounting for components such as the physical efforts, strategic decisions, and political activities that have affected the object, and the creation of documentation for it, I recognize that curators are already, procedurally and thoughtfully (but perhaps invisibly), interrogating these objects before they are even put on display. My research also acknowledges archival literature on these topics; archivists have increasingly been engaged in reflexive practice and research has explored how such an approach to one's work might impact one's written outputs (i.e. label text). Cline (2009: 341) for example situated archivists' work in the context of

the values of public service and argued that archivists should recognize particular kinds of value that sustain this work over many years.

Museum curators construct arguments from their artifacts. In addition to making use of any written documentation accompanying the artifacts, curators also in the course of exhibition-preparation or scholarly research carry out material analyses (e.g., historical markings and conservation work) and obtain further types of data articulated by Renfrew (1967): archaeological association, material class, spatial provenience (findspot coordinates), and 'archaeological taxonomy' (Pearce, 1990: 123-4). Curators may make use of object relations theory to first establish what kinds of personal connections an individual may have had with particular objects (what utility objects may have had in the individual's life) and then devise ways to communicate this understanding to a given museum visitor. Recently, Froggett and Trustram (2014) have applied this theoretical framing in a research project that explored ways to enhance access to new understandings of objects for people who may face special challenges in doing so ordinarily. As curators today work to meet the needs of both in-person and virtual patrons of the museum, they may engage in new practices which are only faintly similar to those practiced even just a few decades ago. Mass digitization projects, now brought to a state of completion with the expertise of specialists in digital information, data, and metadata, have borne results in the form of exhaustive online galleries for collections such as Europeana (Dahlström, Hansson, and Kjellman, 2012) and 3D interactive displays that replace the physical artifact (Hollinger et al., 2013). The impact of technology in revolutionizing these museum practices, particularly as they affect museums' relations with native and indigenous communities and cultures, cannot be overstated. Some of these communities deeply value what museums can do,

and they support the museum enterprise in ways both material and intangible (van der Grijp, 2014).

Scholars explore why and for whom museums collect, and I draw on this literature in my writing. Pearce (1994: 126) considered the history and philosophy of collecting with a special focus on elucidating what the task of the curator is toward understanding ourselves. In addition to contributing to anthropological scholarship, for example, she writes that these insights "can have many spin-offs for the ways in which we approach exhibitions and museum teaching." Kakaliouras and Radin (2014) concurred that exploring museum collections has much to say for informing the practice of anthropology, specifically in proposing new questions and types of questions and avenues that might not have figured prominently in the historical body of scholarship. Such studies also hasten real-time, real-world efforts around repatriation and restitution, such as the ramifications of NAGPRA for physical anthropology collections and sacred objects from indigenous peoples. Specific to archaeology, another approach that museum curators borrow from archaeological work is to trace how an artifact was made. Curators supplement exhibit designs with information gained from object provenance studies conducted through chemical analyses (and usage studies conducted via microwear analysis): stone is an ideal material, along with glass and obsidian, as well as with pottery and metals (Tite, 1996). These efforts strengthen museums' support of material culture research. Museums also partner with U.S. archaeological organizations and with classroom teachers and children, such as in the Parks as Classrooms program and the National Heritage Education Program. In the United States, archaeologists have sought public support to overcome harmful attitudes around site vandalism and looting because they recognize that passing laws and enforcing legislation is not enough (Frost, in Merriman, 2004). Museums play an important role in connecting public

audiences with archaeological heritage. Having discussed in this section the purpose of museums with regard to interpreting archaeological collections, below I conclude this chapter by noting how these ideas motivated my study.

EXPERIENTIAL MOTIVATION

This research is motivated by my interests and experiences in the field of museum archaeology. My archival work with a collection of an archaeologist's personal papers introduced me to issues of interpretation and meaning in archaeological scholarship. Participating in a classical archaeology project gave me tacit knowledge of a range of activities – survey, illustration, measurement, cataloging, conservation, and museum design – and fostered my interest in exploring object paths from the field to the museum. Returning to the field of archives, I researched provenance using archival records and found the confluence of archaeological archives to be fascinating. Applying digital photography techniques to a museum teaching collection motivated a continuing interest in the curatorial work involved in bringing exhibits to fruition.

I illustrate the above experiences so as to situate my dissertation research approach as one informed by experiences within the humanities and in museum contexts. In this chapter I saw that museum curators are not in conversation with archaeologists regarding the creation and description of archaeological collections. I saw this in practice at both sites where I have worked, and I chose to focus my research on bridging the gap between the two worlds. The present study is an analysis of multiple professional work practices situated in the discipline of museum archaeology. Overall the issues and literature I have explored in this chapter and the one previous

serve as the material from which I developed and pursued the research questions presented in Chapter 4; the first section below introduces the general scope of my study.

4. Research Design: Multi-Sited Ethnography

Drawing on the above introduction to archaeological curation, my research studied this activity by conducting a multi-sited study centered around archaeological objects and their documentation. The activities I studied include what data and documentation are produced by archaeologists handling newly excavated objects, how these data are recorded into particular systems, how these systems are transferred from archaeologists to curators, and how museum curators might construct an exhibit from gathering these data completely. The approach taken in the course of this research, at the aggregate level of understanding four different research sites' contributions, was multi-sited ethnography. Multi-sited ethnography contends that the relation between people and places should not be bounded by the "localizing strategies of ethnography" (Falzon, 2009: 3), and it expresses an underlying theory of social constructionism. This theory in basic terms holds that groups construct knowledge about the world. Epistemologically this approach sees human actors in a state of connected movements; each of the communities of practice I analyze has a distinct way of learning and structuring knowledge and I explore this through the idea of "dueling databases" between the communities. An emphasis on connections – "more routes than roots" – most strongly distinguishes multi-sited studies from traditional single-site studies, but it also introduces a unique set of concerns. These include issues of periodicity regarding the "moments of inspiration" that strike during ethnographic fieldwork (Falzon, 2009: 7) and in my case, complexities in trying to make analytical connections within and across my heterogeneous data. To reconcile for the purposes of analysis the multiplicity of perspectives surfaced in my study, I integrate Wenger's (1998) community of practice theory in identifying actions that shape work practice, and I then articulate multiple handoffs where these actions are

in discontinuity with the expectations of a neighboring community. I adapt the archival theory of a *continuum* of continuous workflow during the life of an archival record (Upward 1996, 1997) to a *discontinuum* of complex discontinuities during the life of archaeological documentation so as to illustrate my interpretation of the overall environment within which these handoffs occur.

In order to arrive at this aggregate understanding of archaeological curation broadly speaking, I spent time learning and observing the individual processes in place at each of four research sites in detail. It is at this more site-specific level that the approach of object biography provided me with clear direction to uncover a site's practices. I pursued this approach in order to gain detailed insight into the internal workings of each site. I argue that such an object biography approach is most useful for understanding process at a single site; notably, Alberti singles it out as being particularly fruitful for studies of archaeology in museums. Alberti (2005: 560-1), a museum scholar, envisioned the following goals for this approach: "We can trace the careers of museum things from acquisition to arrangement to viewing, through the different contexts and the many changes of value incurred by these shifts. In doing so we study a series of relationships surrounding objects, first on the way to the museum and then as part of the collection." Anthropologist Wiener (n.d.; 2016) has similarly termed such an analytical, object-driven narrative as a resography, or "thing story." My research acknowledges Alberti's goals in carrying out a study with observational methods to more accurately depict archaeological curation as it happens. This approach recognizes that the prehistory and provenance of an object is built and constructed cumulatively when the object is excavated, documented, collected, accessioned, described, and then perhaps accessioned again. While I have acknowledged that curation involves field participants as well as museum participants, my preliminary observations indicated that "collaboration" between these participants may be more a matter of handoffs and transition

points than of mutually agreed-upon practices. This is a result, I argue later, of the professional gap between archaeologists' work and curators' work, as well as the lack of input in archaeological projects by archivists and collection curators, and the dearth of "archaeological curation scholars" studying these issues in a macroscopic way. Below I introduce my study's research questions, and the methodology I follow to answer them. I then describe the theoretical frameworks that undergird this work: firstly social constructionism, which recognizes the situated nature of each professional contribution in my study design. Secondly, I discuss how the notion of communities of practice informs my analytical argument that each professional contribution is a product of social and disciplinary pressures. I discuss my rationale for selecting each research site by briefly introducing each site and the issues that arise there with regard to a particular contribution to archaeological curation. I follow this discussion with an explanation of the qualitative methods I used for data analysis and how I arrived at the main findings of my research.

THREE RESEARCH QUESTIONS

Working within the field of museum archaeology, particularly in the management and exhibition of collections, my study explores curation work and strives to create a new model of curation processes. A multi-sited ethnographic approach promises particular insights for curators tasked to exhibit objects that have "contested" meanings (Alberti, 2005). Contested objects are more attractive for exhibition and display because these objects compel scholars, curators, and visitors to read in them a history of changing viewpoints. Through a controversial skeleton, or a statue, we gain a touchstone for debating current issues suggested by lines in the exhibit label

about the objects' provenance, ownership, or origin. Having data that are generated at multiple previous sites in an object's provenance history, rather than just from one site, gives curators a greater range of historical events to choose from in writing and presenting the exhibit narrative. I recognized multiple sites' richness with regard to curation in designing my study. With object biographies, an object can have multiple stories – especially true of contested objects – and a multi-sited approach is better placed to capture a wider range of those stories. This study sought to answer the following three central research questions:

1) Who performs archaeological curation and what does each actor contribute to curation activities?

2) In what ways does archaeological curation segment into distinct professional communities?

3) Specifically, does the form and use of objects' accompanying documentation change at transition points, and if so how and why?

THEORETICAL FRAMEWORK FOR THESE METHODS: SOCIAL CONSTRUCTIONISM

Social constructionism is a belief that scientific knowledge is not purely objective, but is either partially or fully socially constructed. Pickering applied this theory in his history of the discovery of quarks, and its proponents in archaeology include Shanks and Tilley (1992). My research treats my data, collected with ethnographic methods, as informed by a social constructionist worldview (Crotty, 1998). This section discusses how social constructionist theory supports my choice of methods. I briefly introduce material culture theory which informs how museum scholars present narratives on the social lives of objects in museum exhibits.

I approach the documentation of archaeological curation as a socially constructed source of data. I recognize that the data creation process may be an imperfect, subjective derivative of the "ideal" standard for creating this information, for example as it appears in a deceptively simple exhibit label. The process of creating these data is subject to the particular constraints weighing on the person creating it (in the case of archaeological fieldwork, the archaeologist). This documentation is the result of a formation process, which I seek to illustrate (for more on archaeologists' comfort with multiple forms of evidence see Schiffer, 1996). Many scholars have commented on the constructedness of documentation, whether with textual or visual forms of representation. Rieger (2008), for example, examined the presence of social constructionist theory in the documents of scholarly communication, and Harvey (2000) saw it at work in geographic information systems. It is important to recognize that such constructedness on the part of the researcher's perspective may be exacerbated by the use of new technologies to capture ironically ever-more-theory-laden forms of material data: techniques such as microscopy, illustrated by Killick (1996), make artifacts' physical properties apparently much more manifest, at the cost of dependency on a techno-logical construct. Some scholars argue that technologies are equalizing scholarly access to spatial data (Opitz & Limp, 2015; Bergrren *et al.*, 2015) but others counter that we have not yet reconciled the consequences of these digital processes by developing theories and presentations of data that elevate technology beyond a service role (Huggett, 2015). Sontag (1977) vividly illustrated that photography is interpretation. Interpretation is no detraction from the quality of the research, as Schwartz (2002) argues, because observing the interpretation edifies the researcher herself and the topic of study. Scholars call technology into question in arguing that even intricately captured data are constructed. Kristiansen (1996) explores the relationship between historical, national economic

events and their impact on the creation of the archaeological record, for example agrarian expansion and the creation of preservation policies and museum object collections for movable cultural heritage in Denmark. Parezo (1996) illustrated how preservation of archaeological archival records involves human labor, which can make the quality and extensiveness of the records produced by archaeologists (and saved by archivists) highly variable across projects. By acknowledging the subjectivities bound within archaeological records, users of these records will then acknowledge the possibility for telling multiple stories and narratives. I have approached my study in a way that avoids making objective claims and instead strives to state the personal biases and subjectivities I and others bring.

The archaeological theory of postprocessualism, which this research follows, elevates the importance of context. Whereas processualism and culture history theory make extensive use of systems such as classification, typology, and taxonomy to organize archaeological data and articulate culture process through generalizations and functionalism (Binford, 1962), post-processualism (Hodder, 1982) argues for a shift toward particular culture histories (over general processes) and of valuing the role of human agency and the existence of individual systems of society and cognition – while retaining the use of classification, typology, and taxonomy systems. Thus, while I will not be using archaeological records to test expectations, I will use them to construct arguments about what curation work entails. My study accepts that archaeologists carry out their work within physical constraints both general and specific; they "see past life through the media of space and form inserted within the linear models of time" (Yentsch and Beaudry, 2001: 215).

The concepts of space, form, and time are themselves social constructs, making archaeological interpretive work doubly so. By examining the context of an artifact, beginning at

the item level and gradually drawing back to the levels of typology, format, and regional distinctions, archaeologists make inferences about the meaning of the artifact by outlining these different contexts in which it has existed. As applied to the archaeological record, Hodder (1991) likened an artifact to a text and in so doing, created an explicit analogy between the context-based meaning of artifacts and the meanings of written words. Later, Buchli (1995) problematized the difference in interpretative potential of material and textual evidence. The fact remains that material objects are difficult to interpret. However, the observational methods I describe below are rooted in present-day ethnographic methods rather than experimental ones. It is important to recognize I am not approaching this research with the questions of an archaeologist; instead I am trying to understand the archaeologists' questions – hence I style this study as an ethnography, one carried out by a participant-observer.

Similar to the archaeological ethnography of photographic images that was conducted by Bateman (2006), this research examines the production of provenance data as an outcome of archaeological and curatorial practice. I study the character of the production and materiality of this data – what tools are necessary, what techniques are employed, which people are or can be involved. I also situate curation work as part of a broader understanding of provenance as a conceptual framework, which indeed the archaeologist (and curator) *constructs*. I draw on many heterogeneous forms of data for analysis, but unlike a historical archaeologist I am telling a story that crosses multiple sites, disciplines, and certainly objects. My research is concerned not with direct archaeological interpretation but with what the treatment of artifacts says about the professional workers who collected them.

THE COMMUNITIES OF PRACTICE ANALYTICAL FRAMEWORK

This study argues that while at least four professional communities contribute to archaeological curation, each of these communities does so under particular disciplinary pressures that remain localized. Taking the situated nature of learning in social environments as a central observation in my study, I look toward the concept of the community of practice to frame my research findings. Studies of the learning practices of domain communities gave rise to the community of practice concept, a primarily social framework for understanding how groups share information and experiences (Lave and Wenger, 1991). Situated learning, which theorizes how certain social engagements facilitate the acquisition of professional skills by individuals, characterizes my interpretative approach and provides a framework within which I analyze the particular activities I observed. Along with active participation and the sharing of content, a major element of situated learning is the presence of a community, which provides the learner with opportunities to interact and share knowledge with other individuals pursuing the same interests. Developing from their critique of the previously dominant cognitive approach to learning, Lave and Wenger's (1991) concept was initially grounded on five ethnographic studies of professions traditionally inhabiting the apprenticeship model, including tailors and navy quartermasters. The concept has enjoyed a wide diffusion in multiple disciplines including information studies in the decades since, highlighted by Brown and Duguid's (1991) study emphasizing the role of informal groups in organizations and the role of narrative, as well as more indirectly but no less significantly Orr's (1990) ethnographic study of photocopier repair technicians and Suchman's (1987) arguments regarding the constructedness of human-computer interactions. The community of practice framework is supported by a constructionist epistemology and understands expertise as a fluid and collective pursuit rather than one

dominated by formal hierarchies or levels of bureaucracy. My selection of this framework aligned with my perception of the structure of the dig field site in which I participated, which valued collaboration and labeled each participant as a member of one or more "teams." I characterize this and others of my field sites as collaborative, wherein each participant frequently interacts with many others and definitive actions are the result of sustained engagement and collective input. Competitiveness and power relations were not central themes arising from my initial data analysis; rather I became most interested in articulating how daily, intricate practices came together to shape the identity of the various practitioners and their relationship to the archaeological objects that pass under their care. To write my analysis, I initially created detailed descriptions of my participants' daily practices (related to archaeological curation), as this is helpful prior to advancing further. I later elevated this work to the higher-level analysis afforded by the community of practice concept, in the course of interpreting the pervading effects of these practices.

Communities of practice can form as part of a need among practitioners to make "work habitable" (Wenger, 1998: 171), and I became interested in pursuing an interpretation of my data that would describe emergent properties among and across the four key professions that were a part of my study. In analyzing the activities and my data gathered about those activities, I am primarily interested in understanding what individuals' daily practices reveal about the priorities of a particular professional community to which they belong, how these four sets of priorities diverge and/or converge (under the cause of sharing heritage), and what this analysis says about the future directions of the field of archaeological curation. I study practitioners because I recognize that such people have experienced and progressed through a system of initiation and possess skills for carrying out their particular practice.

METHODOLOGY: FIELDWORK AND PARTICIPANT-OBSERVATION

I study the activity of archaeological curation and the creation of object documentation using the ethnographic methods of observation, participant-observation, and informal interviews. Above in Chapter 2, I discussed prior ethnographic studies of museum curators, archaeologists, and archivists. My study departs from these in employing a multi-sited approach to examine a core activity (curation) that is not confined to a single profession.

My targeted observations are designed to gather detailed information about procedural workflows around archaeological objects. I center my observational data around capturing all activities performed on particular objects (towards a biography of object curation) within a particular site. These activities produce documentation, which I ultimately analyze at aggregate levels of work practice. I collected data for my dissertation using the methods of participant-observation and of observation. I participated each day in most aspects of the archaeological program at a research excavation site: observing, taking detailed notes, carrying out assigned tasks, and asking questions about particular practices for object-handling. At four sites I observed professionals at work and asked questions about their curation practices. My resulting data consist of detailed fieldnotes, audio recordings, experience in artifact handling, and representative documentation that was shared willingly by my participants.

My research employs an inductive method and uses purposive sampling, participant-observation, and interviews to generate a collection of evidential data and documentation, the content of which I analyze with close reading. These qualitative methods are informed by a grounded theory approach but adhere to only some of its tenets: e.g., the study makes use of an

open and flexible range of data, and during the later analytic phase it constructs a core category that is traceable through the data. Pettigrew (2000) in particular notes that the use of grounded theory principles complements ethnography and can result in a deeper insight into a phenomenon. During the participant-observation portion of my study at site #1, I engaged in continuous monitoring of the phenomenon of object curation, carried out certain practices myself, and wrote memos to capture my observations and experiences. When I observed and asked questions at all four sites, I utilized unstructured (ethnographic) elicitation techniques in order to capture data that reflects the participants' experiences. I further addressed particular issues that arose from these data with semi-structured interview prompts. The study is rigorous, in that I collect forms of data that are appropriate for answering the research questions, and I make explicit through detail my analytical process of induction. The study is limited based on the recognition that some data sources, including material from other research sites, will not be analyzed; therefore it is difficult to claim exhaustive "groundedness." The study's focus on four sites for a limited period of time informed all stages of this research study, including the analysis that follows. The data collection for this study was limited to the span of one year.

Ethnographers, those historically rooted in the discipline of cultural anthropology, are highly concerned with understanding the cultural context of a central concept. Many resulting ethnographies aim to understand a system of meaning that is shared among members of a culture. My study did not examine one culture but rather four separate communities of practice and only those activities concerning my core concept (archaeological curation). Additionally, ethnographic methods have been applied in a variety of distributed contexts in order to understand different cultures: Ritson and Elliott (1999) studied adolescents and their use of advertisements, and Schouten and McAlexander (1995) conducted a longitudinal study of the

rise of biker culture in the USA. Geiger and Ribes (2011) more recently introduced trace ethnography – a technique that analyzes "detailed and heterogeneous data … [to] provide qualitative insight into the interactions of [computer] users, allowing us to retroactively reconstruct specific actions at a fine level of granularity" – as one way to examine distributed activities. Øesterlund, Snyder, Sawyer, Sharma, and Willis (2015) usefully explain how this approach is an example of a larger effort in qualitative information research to prioritize the scholarly study of "documenting work" for work that is collaborative and distributed – two attributes I believed could partially characterize my area. However I ultimately determined that my unit of analysis would be an entire occupational practice, and so what I find to be most useful is Geiger and Ribes' characterization of "heterogeneous data" which prepared me to understand the nature of documentation to be gathered from my research sites. Additionally, my personal approach to this research brought to bear a greater sense of empathetic perspective-taking than of systematic thinking which is a rule-bound "preference for conducting analysis without the distraction of emotions" (Berrett, 2016). During my fieldwork, I did reflect on the physical activities that I carried out (Boyle, 1994), and I remained cognizant of the subtle distinctions between the multiple situated perspectives I encountered among my participants. Therefore, while this research does not follow strictly systematic data collecting techniques, it does still prioritize the study of work documentation. My study may be characterized, if not as a full ethnography, as an "ethnoscopic" study, similar to Holbrook's (1998) work which used the techniques of close introspection and reflection to reveal cultural meanings of a collection of photographs and pictorial records. I also recognize that my site selection and the layers of interpretation I impose on my participant interactions has, generally speaking, much in common with the methodology of traditional historical research – which gathers rich data in many formats

together for the purpose of synthesis and generating new knowledge. So my research design is informed by work that has used these data-collecting methods, such as historical ethnography – Vaughan's (1997) recreation of the steps and missteps that led to the Challenger disaster – and other ethnographies of scientific practice (Shankar, 2004). With my study, I sought to examine a phenomenon I believed was distributed across at least four kinds of sites, and discovered that curation is very much a distributed work activity (less so, a collaborative one). I also noted the broad view these scholars took toward what can constitute data, including items archivists might consider to be ephemera. My research operates structurally through taking an object approach to understanding the content and context of data produced during curation activities.

Collecting Heterogeneous Data

Having explored the techniques of fieldwork and participant-observation that I use, I turn in this section to discussing what kinds of data I collected from my research sites. Data may be contained in many formats, especially in archaeology. Archaeological data are the product of particular archaeologists' ways of thinking and theories expressed in the course of their fieldwork, as well as various legal and funding structures. As Hodder (2001: 8) explained, archaeologists are comfortable using the evidence collected from fieldwork to offer long-term perspectives on society, and to illustrate codependence between people and their *things*. Archaeologists may pay more attention to the content of these data than their heterogeneous formats, which may only become exhaustively enumerated by the time a curator or archivist is made responsible for preserving the readability of these data long-term (Mayernik, 2016). They conduct fieldwork to create new knowledge with objects never before examined. In my research,

I recognize knowledge creation as the archaeological goal my participants are concerned with, and I focus my efforts on observing and interpreting the ways my participants accomplish this goal. The archaeological data whose production I analyze in my project may be contained in many formats: paper notebooks, plastic or paper bags, labels, digital documents, databases, ephemeral verbal conversations (face-to-face and via phone), and photographs. My focus on data is rather unbounded, as I consider all recorded data as possibly relevant. I also attend to issues of documentation management, particularly whether "archival provenance," or grouping of objects with their fieldnotes, is practiced during archaeological fieldwork (Marino, 2004: 47; Sanjek, 1990). It was particularly interesting, for example, to attend to hybrid practices spanning both paper and digital forms of recordkeeping. The explosion in use of digital data recording and recordkeeping tools in archaeological science and practice is well-attested (Alleen-Willems, 2012; Watrall et al., 2013; Motz, 2015; Roberts and Fehrenbach, 2015) and I draw on my archival studies background to contextualize the changing technologies I observed in the use of record-keeping forms.

Scholars in archaeology, art history, and sociology, among others, have explored the social life of things as an added dimension of physical objects. My study draws some inspiration from the tradition of research influenced by the model of object biography outlined in Appadurai's *The Social Life of Things* (1986), in which he asserted that physical markings project *regimes of value*, and that these are in turn commoditized by society in different ways through space and time. Art historians, as well, have responded to Benjamin's "Unpacking My Library" (2007) in accordance with its claim that provenance does have an impact on an object's value. The field has seen Benjamin's claim become manifest with the creation of such resources as the Getty Provenance Index® in 1983, but also in the form of greater respect and scholarly

resources directed toward provenance research beyond its historical practice as an antiquarian pursuit. In this study I pay attention to the path that emerges in following archaeological objects after these objects are excavated. My focus is not only to illustrate, but to also contextualize the impact of particular activities. Answers to my research questions from fieldwork allow me to articulate a framework of curation as part of museum work, from focusing on the path – the provenance – of artifacts as they become part of a museum's archaeological collection. By focusing on the concept of provenance, I adopt temporarily the approach of an object biography, viewing provenance data as evidence of these objects' "lives." This "object biography" is constructed through the accrual of metadata. At the site level, I situate my perspective from the standpoint of the object, which is acted upon in certain ways by humans; thus I focus my observations on the people handling these objects, but do not go on to make the same claim as Alberti (2005) that the objects have innate agency. I recognize that these objects exist within one or more institutions, and I acknowledge related work that has applied the lens of actor-network theory to more closely examine social relationships in archaeology (Khazraee, 2013). A multi-sited ethnographic approach might allow for certain such network relations to reveal themselves.

I employ the multi-sited ethnographic approach in part to account for the situated nature of my research design, i.e. the degree to which my research sites and participants may not be representative of the wider realm of the archaeological curation field. Still, I recognize the view that good archaeology is local; close understanding of a situation carries its own value and relevance (McManamon, Stout, and Barnes, 2008). Additionally, as I illustrated above in Chapter 2 for archaeological archives, I acknowledge a certain resurgence of enthusiasm and uptake for object biography research approaches across the archaeological discipline. Workshops at the 2014 and 2015 American Schools of Oriental Research conferences have advanced our

knowledge of how to articulate the greater context and "enchantment" objects possess using rigorous approaches, most significantly under the goal of making objects more accessible to more people (Hauser, 2014; Hauser and Serwint, 2015). In focusing on the actions to which objects are subjected at different stages of their journey after fieldwork, I am seeking to find commonalities of practice that may permit me to transcend the particular, situated sites I examine. Commonalities are partly an outcome of the system of regulations and legislative frameworks in place for managing archaeological resources. My methods focus on analyzing how the activities work and identifying issues of concern to broader professional practices. To gather data at each site, I ask guiding questions based on the thematic focus of my research questions. Having discussed my methods for gathering data, I now will introduce my research sites and the rationale I used to select each site before any data collection had yet occurred. Following the discussion of my sites, I present specific guiding questions I ask in my study and then I describe my approach to analyzing the data.

Site Selection, Rationale, and Curation Roles

In order to answer my three research questions, I sought to observe curation practices where they occur, at different points along a path of archaeological work. I collected data using ethnographic methods at four research sites, each of which was purposively sampled as representative of a different aspect of archaeological practice today: fieldwork (including research-oriented and Cultural Resource Management work), museum practice, non-museum repository practice, and conservation practice. Below is Table 1 in which I lay out my rationale for selecting four key research sites.

Table 1. Site Selection and Rationale

Site (Date of Project Activity)	Brief Site Description	Method of Interaction	Site's Anticipated Role in Curation	Contributions of these Data
1. American Excavations at Morgantina: Contrada Agnese Project (8 June-3 July 2015)	Academic archaeology long-term research	Participant-observation	Excavation; Object discovery. American research team. Objects remain in a local museum.	Provenience data-recording practices. Digital data *entry* and database focus. Archaeological context for analysis. Some museum practices.
2. Coastal Environments, Inc.: Texas site (June-August 2015)	Cultural Resource Management (CRM) firm	Observation, Informal questions	Excavation; Object discovery. Some objects transferred to a statewide repository (site 4).	Provenience data-recording practices. Digital data *management* focus. Archaeological context for analysis.
3a. Bullock Texas State History Museum. *La Belle: The Ship That Changed History* exhibition (2014-2016)	State (public) museum	Observation, Informal questions	Public display; Exhibition; Preservation.	Object database for an entire project. Changes in database technology, and metadata captured. Object's role in telling the story of the site / project. Physical condition descriptions.
3b. Conservation Research Laboratory (2015-2016)	State (public) conservation lab	Observation, Informal questions	Conservation treatment documentation. Objects transferred to a statewide repository.	Provenience data recording practices. Facilitate scholarly research of material classes.
4. Texas Archeological Research	Statewide repository	Observation, Informal questions	Preservation; Object handling.	Curation procedures, standards,

Table 1: continued.

Laboratory (2014-2015)				workflow, barriers, and pressure points.
Review of Literature		Qualitative		Identify research questions and inform analysis.
Terry Childs (Archeology Program, National Park Service)		Informal conversation (31 Mar. 2016)	Leading expert on archaeological curation.	Calibrate themes and discuss future directions.

Table 1 lists my purposes in observing work at each of four sites, and it has two additional rows, as I attempt to be exhaustive in listing all the sources of data that contribute to my analysis. Thus I also include my review of related literature (which helped me identify themes) and informal review of my findings with an expert on archaeological curation, with whom I interacted by discussing profession-wide trends and issues. One site is divided into two component sites because as I proceeded with my data collection, a different function presented itself that was relevant for my analysis and inherently connected to the work of the first planned site. I chose to study at site #3a, a state museum, and not the original excavation of *La Belle* because I was not present to witness the excavation in 1996-1997, and because I was able to observe the state museum actively engaged in preparing artifacts from that project for exhibition. The projects I observe and analyze in this study largely occurred over the 2015 calendar year, as well as the following supporting activities:

- Submit IRB Research proposal: April 2015
- Dissertation proposal defense: September 2015
- Data analysis and follow-up: Concurrent with collection; Fall 2015

I carried out observations and interviews with multiple participants at each of four sites (Table 2 for details; participants are further detailed in Appendix 1).

Table 2. Research Sites and Study Methods

	Excavation (3)	**Conservation laboratory**	**Repository**	**State museum**
Observation hours	180	10	20	20
Interview hours	8 (two focus group sessions)	5	10	15
Dates of data collection	*Classical*: 13 February 2015, 8 June-3 July 2015. *Contract*: 21 April, 22 July 2015. artifact processing: 6 Nov 2014, 4 Dec 2014, 15 Dec 2015. *Archival (La Belle)*: 19-20 November 2015.	3-4 December 2015.	28 February 2014, 6 March 2014, 10 April 2014, 6 & 8 October 2015.	8 April 2015, 20 July, 23-24 July, 12 & 18 November 2015, 22 January 2016.

My selection of each site reflects the argument in this research: that archaeological curation is a distributed, collective enterprise. I position the archaeological field sites as the places where curation and provenance documentation begin. Again, each site presented multiple activities rather than just the one most obvious in its name. It became evident that archaeologists, conservators, and museum staff contribute archaeological curation work, and that some activities build on the work carried out at prior sites from months to decades earlier. The quality of the first-stage activities from fieldwork impacts whether the later-stage activities, which are more

publicly-oriented (exhibition), occur at all. Many objects are never exhibited because they lack field site documentation, as the literature shows.

For purposes of this study, I place the beginning of my archaeological curation investigation at the time an object is excavated, and the end at the time an object is displayed or exhibited in a museum. Research activities can occur at any point along this process, including the publication of an excavation by field archaeologists and to a lesser degree after an accession or exhibition has made scholars aware of previously unstudied artifact collections. Reflecting this view, I selected two excavation sites, a museum, a non-museum collecting repository, and a conservation lab – places where I could carry out detailed observations of everything I see there that might relate to curating objects. Thus my methodological purpose in selecting these sites was to observe particular, programmatic activities, and above all to take detailed notes of everything. This allowed for emergence of what types of activities can be considered to be curation. This proposal mirrored that which I outlined in my IRB application (2015-04-0094) regarding interacting with these four sites for dissertation purposes.

Observational Guiding Questions

At my fieldwork sites (classical and contract), I asked guiding questions in pursuit of a close study of object documentation and to develop an understanding of how objects are cared for (Corbin and Strauss, 2008: 72). Table 3 below presents a practice-oriented set of questions that, while neither exhaustive nor binding, I used to guide my interviews with the archaeologists and curators after some observations to explore "the why" of my research questions; as I listened actively I asked follow-up questions. I intended these questions to prompt the person to assert

and to detail the role they occupy in the handling of objects. I supplemented these observations with close study of bespoke project databases and the structured metadata that is captured about objects.

Table 3. Guiding Questions

Theme Explored	**Question Item**	**RQ Addressed**
General data journey	What is your general process in planning to collect your field data (in a new project / new season),? What components do you need in place?	1. 2. 3.
Data granularity	What tools or technologies do you use to record data? Show me how these work (what you capture). Why these?	3
	What metadata and provenience data do you seek to record about an object? Why are these fields useful for your work? [*geared to particular objects*]	1
Provenance and provenience	What protocols do you follow around artifact documentation?	3
	Do you have too much data about objects? Too little? What components would be useful for your purposes?	3
	How do you capture these data? How would you like to capture these data? How would you like to present these data, and to whom?	3
To gather situational context: Curation in project management	What activities must be done in the field? What needs attention or follow-up afterwards?	1. 2
	Do you have daily priorities? Project priorities?	1
To gather situational context: Data analysis and interpretation	How do you know when your data is ready, or done?	3
	How often and for what do you access original fieldnotes from past projects - either your own or about this site?	1
At site #1: Time estimation and work rates	How do you estimate how long an archaeological project will take? What components are predictable across projects?	1
	How do you assign data work among the team members?	1. 2

From my four sites, I gathered different types and amounts of data which I closely studied in constructing my analysis. In particular, I position my data from the academic

archaeology site foremost in informing my construction of the key (curation-related) activities of an archaeological fieldwork project. So too, do my more limited observations from the CRM archaeology site inform my analysis of field archaeologists' work activities. I gathered observations from these two sources in order to explore whether data-recording processes occur *before* objects reach their intended collecting-repository destination (in the home nation of the respective dig), and by analyzing my data I explore the questions of how and by whom. After participating in a field season, I returned to my other research sites with awareness of field practices and was able to ask more focused questions about the provenance and background of the conservators' and curators' objects of study. I ordered my site interactions in this way because I recognized that though sites would not be directly linked to one another in a single project, each site would allow me to see some range of activities that comprise archaeology as it is practiced today – activities that have not previously been documented holistically as part of museum curation work. Thus by the time I did visit repositories and museums, I had a better understanding of the processes that had occurred outside of such settings.

The word "curation" has multiple definitions, but in terms of both common use and legislation the concept is mainly constrained to museums, and previous work has only examined curation from the starting point of what is practiced in museum settings (Pearce, 1990). My analysis reveals that other people (besides museum staff) are in fact doing curation, but are not naming their work in this way. With thanks to Sullivan and Childs (2003), the discipline of archaeology is now laying claim to "archaeological curation" as an archaeological practice, and my study offers a faceted investigation of how and where this occurs. I pursue the argument that curation happens at non-museum sites. My research brings together and interrogates two disparate views on what curation work might entail: the archaeologists' view of their fieldnotes

as relevant only to the research they do in the field, and the museum studies view that nothing curation-related has happened to objects in the field before they reach a museum. Both of these views fail to appreciate that other professional communities might use and manipulate data – that is, contribute to curation work.

To gain familiarity with two of my planned research sites, I held exploratory meetings and conducted pilot observations of repository work with professional collections managers. I shadowed the Head of Records at a large collecting repository (site #4) and observed daily work with archaeological documentation, including the interpretation and entry of data in both digital and paper forms, and the presentation of these data to researchers. I completed a semi-structured interview with the institution's former archaeological archivist as well, in which we discussed a span of activities that occurred over a six-year period pertaining to archival management, outreach with archaeological materials, meeting researchers' needs, and tracking new acquisitions. This interview was particularly insightful because the archivist described how she was able to implement records management and registrar principles in an archaeology setting that until then had relied on institutional and personal knowledge of sites. The archivist also described an outreach program created with hands-on activities that gave classes of grade-school students the chance to learn from archaeological contractors and agency heads about the work of archaeology. I met with the lead excavator / lead exhibit curator of the *La Belle* shipwreck and museum exhibition (site #3a), as well as its lead conservator and the designer of the restored hull's new support structure. From this meeting I emerged with a better understanding of the actors involved and the specific recordkeeping technologies utilized by this archaeological project over a twenty-year period. Returning to my central interest in archaeological curation, I

used the ideas obtained in my pilot notes and transcripts to articulate the overall position each site occupies with regard to managing archaeological collections.

I began by recognizing that statewide repositories, also known as "curatorial facilities," occupy a significant position in archaeological curation and are the places where one or more professionals are responsible for managing, describing, and providing access to multiple collections. In preparing for my site visits, I researched these practices and examined what collections work occurs at the sites I would observe. Below, I offer a brief introduction and overview of my research sites, beginning with the excavation sites.

Academic archaeology

Reflecting the global nature of archaeology, American archaeologists have been deeply involved in projects located outside of the Americas. Field archaeologists based in academic departments of archaeology and anthropology lead excavations in such countries as Turkey, Greece, and Italy with sponsorship from federal programs, private funds, professional organizations, and government support (further explored in Dyson, 1998: 232). A snapshot survey by the Society for American Archaeology that sought to quantify the archaeological profession in this country estimated there to be about 1500 academic archaeologists affiliated with a university (Snow, 2006, quoted in Ollendorf and Burrow, 2013), or about one-sixth the number of private CRM archaeologists. Such academic archaeologists work on archaeological excavations located mainly in the United States but also in other countries. These research projects might possibly be characterized as more nimble and receptive to changes in practice, particularly when compared to the regulated nature of CRM work.

The Morgantina excavation is located in Italy but is administered and comprised of an American research team, whose members share a research interest in classical archaeology. I joined this academic project as a volunteer excavator for the duration of its summer field season in Italy. This particular field season represented the 60th year of excavations supervised by an American research team at this site, first excavated in 1955 under the directorship of two Princeton University professors. The recent excavations at Morgantina have focused on settlements during the Hellenistic and Roman Republican periods (roughly third and second centuries BCE), and the nearby town of Aidone houses a regional museum where objects from the excavations are interpreted. Alongside these objects, the museum has displayed a statue of a goddess, over seven feet tall and dated to the fifth century BCE, in one of its galleries since spring 2011, when its return to Italy by the Getty Museum (which purchased it in 1988) concluded a contentious negotiation and very public debate over its ownership and cultural patrimony (Ritter, 2013; Bell, 2005 among many others). Yet while I was aware of this unique setting, it was only over the course of my participation that I was able to see the museum's role as part of a larger project community connected to the current excavation and the archives housed at Princeton University.

The Morgantina excavation is organized into five teams in order to accomplish different activities over the field season, with each team led by one or more supervisors. I spent time working in each of the Dig, Data, and Museum teams over the four-week summer field season to follow the path of data production. I circulated among each of these teams, which allowed me to see a much richer set of activities than if I had been confined to one setting for the season. I note that other team members similarly enjoyed spending a day or two in a new setting: examples include the excavator contributing to a drone flight trial on the Geospatial team, or the

conservator assisting a ceramicist in pottery washing. At the end of each work period I took time to journal my reflections and observations, and so aimed to overcome the risk that my observations would reflect breadth but not depth. Nevertheless what remained most important was for me to discover the breadth of activities that comprise my key activity of interest – archaeological curation. This pursuit of breadth does require one to visit multiple places and sites of activity (Falzon, 2009). My extensive daily journaling permitted me to think critically about what I saw, and identify processes I could focus my energies on observing the next day. By incorporating a level of analysis during the intensive work period itself, I strove to approach the deep familiarity that another researcher might have gathered in more traditional anthropological ethnography work (Hamilakis, 2011). With a tablet computer program having only been recently introduced in the 2014 season to collect data digitally, the Data Team remained interested in obtaining written and verbal feedback regarding the performance of these technologies. I supported this goal by writing detailed notes about my own observations and experiences.

By immersing myself in the work of archaeology as a participant-observer, I sought to be able to describe in this dissertation the impact of site-specific conditions and constraints that affect recordkeeping in the field. I also gained direct knowledge of both document genres and tools, such as a Total Station,[11] used to capture provenience data as well as the processes of object analysis and interpretation as they are structured into the design of the fieldwork. Through participant-observation, I worked with all members of the research team who came into contact with field data or who engaged in object cataloging and analysis. Because these objects remain in

[11] A Total Station is a surveying instrument used in archaeological surveys and excavations to measure distances and angles between the instrument and a component reflector bearing a mounted prism, and record results of trenchwork. The instrument captures three-dimensional coordinate data for object findspots and site topography, which can then be displayed graphically in GIS software.

a local museum, I also participated in data and museum activities occurring directly after excavation to maintain provenance and provenience data and preserve the information that is generated during the field season. I engaged in other discussions with team members apart from the field season to place the activities of processing and analysis into a temporal context.

As a participant on the Data Team, I contributed to the Data Team's interest in calibrating the recent introduction of tablet computers and understanding the technology's impact on fieldwork practices. With this being only the second season using tablet computers, the Data Supervisor had begun to engage in a process earlier in the season of responding to trench supervisors' and team members' feedback and reactions from using the database, and so the Data Supervisor carried this interest into the focus groups. Drawing on my direct experiences with these field practices on the excavation team, I developed a set of 13 prompts with the Data Supervisor to guide two focus groups held at the end of the season which focused on the trench supervisors' technology habits and processes (Table 4 below). Specifically I asked my questions to the trench supervisors in the first 45 minutes and then the Data Supervisor asked the trench supervisors more tablet-feature-specific questions in the second 40 minutes. Both my set of questions and the Data Supervisor's set were concerned with data-recording processes. The first focus group was held on 30 June with four trench supervisors (Leona, Laurie, London, Lesley), the Data Supervisor (Lacey), and the Geospatial Supervisor, and we held a second 90-minute session with one trench supervisor (Lex) on 2 July. I used both my fieldnotes and transcriptions from these focus groups to articulate recordkeeping practices of archaeologists in the field – and ultimately to analyze these practices as part of what for me was becoming a framework for a community of practice among excavators.

Table 4. Questions about Data Practices Used in 30 June and 2 July 2015 Focus Group Sessions

1. How have you been using the digital interface? What's your daily routine? Notebook first or database first?
2. When does data get entered - i.e.: Finds. Notebook first or tablet first? When it is bagged or at the end of the day?
3. Have you been using the digital database to look up your own work from earlier in the season? Last season's work? Each other's work? What about pottery/finds/enviro/conservation?
4. Have you been using it to look at images in the field?
5. What have some of the challenges been?
6. What have some of the perks been?
7. What do you see as the role of the tablet vs. the role of the notebook?
8. Do you think that role has changed over the years that you've been here?
9. How much do you like writing?
10. How do you allocate time for writing?
11. How do sketches come into play?
12. How does your recording/documentation help you manage the team? Do you think about assigning people [to tasks] or how it's going to look in the notebook?
13. How do you prioritize? Short term/Long term goals?

The Data Supervisor and I approached the topic of field data-recording with an initial interest in seeing whether there was any significant difference in the amount of time required to take notes in a notebook or in a tablet computer. Such a measurement would be complicated, we soon realized, by needing to determine whether an interpretive lens was being overlaid during this process, how that impacted the time needed to complete the documentation, and how time that was spent on related but indirect tasks should be counted. Such a measurement would also depend on an equivalence in the quantity and quality of the notes being taken, and on having a way to compare the two. Additionally, during some excavation seasons, a trench was supervised by two excavators, with one excavating and the other taking on the role of recording spoken notes – how would one separate out the interpretive layer imposed by one or more of these excavators? Based on conversations on 22 June and earlier, we refined the focus of our inquiry from this kind of quantification of time and work rates, to a more qualitative focus on

excavators' uses and interactions with recording tools such as tablet computers and field notebooks. Future research on field site documentation practices might explore comparative work rates by data formats as this is an active area of tool development and current research spans both academic and contract excavations (Huvila, 2015).

Cultural Resource Management archaeology

Contract archaeology offered a very different perspective from the academic archaeological project. Professional contract archaeological work is much more directed by concerns about time, legislation, permitting, and liaising with a collections repository. In this section I introduce the type of archaeology that is most prevalent in the United States and is regulated by federal and state governments. Formal governmental structures for protecting cultural heritage are in place in countries around the globe, and the activities carried out by those structures take the name of Cultural Resource Management (CRM). Today most of the archaeology performed in the United States is done under the name of CRM archaeology: this 90 percent includes university archaeological field schools and research excavations that are CRM-funded (Watson in Bentley, Maschner, and Chippindale, 2008: 32). CRM includes the span of archaeological work that is regulated by federal, state, and local agencies to ensure the protection of cultural resources, including land, historical sites, and objects (Fowler, 1982). Both law and new professional customs contributed to this dominance (Diamond, 1971) but it is not limited to the United States; in Britain this arena is known by names such as [archaeological] heritage management and archaeological resource management. I sought to examine American CRM archaeology because of its dominant presence in the United States. Having made contact with a

firm and attempted to negotiate access for research purposes, I was advised that such access is strictly controlled, and limited only to paid professional members on the project contract. Consequently, in lieu of observing this work directly, I conducted a semi-structured interview with the lead member of the project about his recordkeeping practices. Based on what I discovered about the firm's data paths, I made return visits to the relevant State Historic Preservation Office (SHPO) repository, site #4, to see the destinations of artifacts, examine site records from one of the firm's recent projects from 2012, and discuss recordkeeping practices with staff members. There, I gained complementary, and more holistic, perspectives on the same issues. We respected the legal restrictions that are in place for this sector. In the next section I maintain an emphasis on understanding regulations on archaeology in the United States but move from the highly individualized excavation setting to the repository setting. Repositories manage the collections generated by archaeological excavation.

Statewide Repository

Repositories provide a standards-based perspective on the curation process, which is different from the previous two cases by a unique focus on the physical size and proper handling of each group of material. States follow particular federal guidelines that regulate the care and management of cultural materials. An officially-designated archaeological institution or office within each state maintains statewide responsibility for documenting archaeological sites in that state, for issuing site numbers, for applying collection acquisition and management policies to reflect the nature of its collections' provenance, and for adhering to 36 CFR Part 79 as well as any state-specific curation guidelines, standards, or procedures. State repositories exist so that

archaeological materials can be studied by people other than their original excavators; Neumann, Sanford, and Harry (2001) argued that archaeological materials must be curated in a way that still allows for future research. I observed a repository with statewide responsibility for Texas, the Texas Archeological Research Laboratory. This repository, administered by the state university, is the largest archaeological repository in the state and has a full-time staff of 11. It provides collections care to materials from over 8000 sites and researcher access to archival records and photographs from over 76,000 individual sites. As a state repository, the institution maintains a library with site reports and publications generated at the close of CRM projects. I also performed first-hand artifact processing several times at the processing laboratory of the Texas Historical Commission whose staff prepare collections submitted by CRM project directors for permanent storage.

Each state-designated repository – often but not always the State Historic Preservation Office (SHPO) as seen in the survey by Greengrass (1999) – maintains the official Smithsonian Trinomial Site Designation System for its state (a single three-part state-county-site alphanumeric designation) and makes available basic site data (locational data is usually restricted from public view). The Trinomial system was first developed in Nebraska during the 1930s for its WPA projects and later shepherded by Paul Cooper of the Smithsonian's River Basin Survey in 1946 (Webster, 2014). The state repository I observed is responsible for assigning the site numbers statewide and for managing extensive documentary records resulting from archaeological projects.

The Texas Historical Commission (THC) Collections Manager oversees the curation of about 300 collections with historical significance in Texas; two examples are the collections of *La Belle* (assigned Smithsonian Trinomial 41MG86, site in Matagorda Bay) and the 1554

Spanish shipwrecks (see Arnold, 1992, site in Padre Island) – events stemming from private plundering in the latter led directly to the adoption in 1969 of the Texas Antiquities Code. The Collections Manager also oversees the Curatorial Facility Certification Program for the state of Texas, which ensures that the millions of post-excavation artifact collections held-in-trust in curatorial facilities, or repositories, across the state are cared for properly (THC, 2015a). As of 2015, fourteen curatorial facilities are certified by the program and eligible for held-in-trust state collections: five are located within a university, seven are free-standing museums, and two are located within a state agency. The goal of establishing the Curatorial Facility Certification Program in 2005 was to be able to track the locations and existence of artifact collections held-in-trust, in a statewide database, so as to "spur research." While all the archaeological data (both objects and their documentation) is "protected and confidential under state law," it has also been a goal of the Collections Manager to promote the work of these facilities while also promoting the research value of these collections. Overall, the results of this kind of collections care serve to justify the expense of saving the site data in a repository.

While repositories manage hundreds of archaeological collections and store these collections in appropriate microclimates, museums are the institution with the most explicit public access and exhibition mission. In the section below, I introduce a specific contribution of museums to archaeological curation in the context of a collection prominently exhibited in my museum research site. My museum-focused examination of the *La Belle* project and archaeological collection includes some conservation work which occurred within a museum gallery.

State Museum, and Conservation

Archaeological curation begins on the site of an archaeological excavation – a phase of curation that has been understudied and where I sought to contribute new knowledge. I expected to observe museum-specific curation activities at my fourth research site: the Bullock Texas State History Museum. My pilot discussions with museum professionals there laid out the scope of the *La Belle* project, a 20-year program to excavate, conserve, curate, and exhibit artifacts from this 1686 shipwreck site in an estuary bay on the Texas coast. From its opening in April 2001, the interior design of the Bullock Texas State History Museum was intended to showcase *La Belle*. Though it is a non-collecting museum, the Bullock has showcased *La Belle* through the display of artifacts loaned from the Corpus Christi Museum, which serves as the state Marine Archaeology Repository. The excavation of *La Belle* occurred in 1996-1997, and I examined the archival records collected from the excavation. I conducted observations and interviews with *La Belle*'s conservators at the museum and conservation lab responsible for these components of the program in 2015.

The museum's primary role with regard to the *La Belle* project has been to interpret the historical events for the public. The narrative that the museum has presented emphasizes the story of La Salle's ill-fated expedition to the Mississippi River region sponsored by King Louis XIV of France. It is clear that this narrative highlights the French settlers' meetings with Native Americans, which emphasizes the impact of the expedition on Texas history. The narrative should also be understood in the context of scholars' decisions to study this as an early French interaction with the continent of North America, a subject where a large literature gap previously existed (Weddle, 2001; 2013). As a product of this particular scholarly emphasis, the Spanish have a smaller presence in the telling of the *La Belle* story up to the sinking. (After the ship sunk,

the narrative broadens to include the betrayal by crew member Dénis Thomas of La Salle's expedition to the Spanish Monarchy, and the eventual discovery of the shipwreck in April 1687 by a Spanish party). It is important to acknowledge that the context around which a museum presents a given historical narrative is political as well as artifact-informed. The Bullock Museum's narrative is continued through the activities of the La Salle Odyssey, a series of seven museum exhibits opened in 2004 along the Texas coast. This network of seven museums uses distinct exhibits to interpret different aspects of La Salle's expedition and the science behind the excavation, educating new audiences about an important chapter in American history.

Conservators designed and oversaw construction of a specialized 60x20x12-foot vat, or tank, to soak 400 timbers recovered from the 1996-1997 excavation in polyethylene glycol (PEG) and support the first reassembly of the hull, which was completed in fall 2001. This conservation method requires, among others, an investment in time, and over a decade the use of PEG grew too cost-prohibitive to continue. In late 2010 the archaeological team made a dramatic shift in approach by electing to freeze-dry the entire hull (Levey, 2010). The team tagged each timber (with documentation), made molds, and disassembled *La Belle* in order to load all parts of the ship in the freeze dryer for four to six months each. The freeze-dry process was completed in 2014, at which time conservators transferred the timbers for reassembly at the Bullock Texas State History Museum.

The museum's first-floor galleries were renovated in 2014 in association with a design firm in preparation for the arrival of *La Belle*. Since spring 2015, *La Belle* has anchored the first floor gallery interpretation of early Texas and Native American history, alongside conserved artifacts exhibited for the first time comprising La Salle's "colony kit" including a ring, leather

shoe, bronze and iron cannons, muskets, and a 1/12 scale wood model completed in 2014. According to Bullock Museum Director Dr. Victoria Ramirez,

> The story itself introduces new scholarship to early Texas history and the ship's hull and artifacts are in remarkable shape, especially considering they had been under water for over 300 years. *La Belle* is one of the oldest and most complete shipwrecks to be on view at a museum. *La Belle* also reminds us that it is the small incidents that can have the greatest impact on history. For example, had *La Belle* survived the storm and La Salle was successful, Texas might be a French-speaking region today. Installing the *La Belle* shipwreck meant a complete re-envisioning of the Museum's first floor permanent galleries. To most completely and clearly share the significance of *La Belle* the gallery will also feature artifacts from early Texas, including the earliest known man-made artifact in the region from the Gault archaeological site in Central Texas. (Page, 2015).

Current plans at the museum call for the reassembled *La Belle* ship hull to be contextualized by an exhibit theme of contested sovereignty, situating the European arrival within the existing power struggles of Native American peoples in the seventeenth century. One paradox of this story – that most of what we know of the Native Americans' history was written by Europeans – is addressed in the curators' use of both a timeline to emphasize the dates of pivotal events (in contrast to the previous, more broadly thematic exhibit with less attention to chronology sources) and a full-sized model of a bison to illustrate the centrality of their movements in structuring native lifeways (Mabel, 7/20). These features will emphasize the central story of *La Belle* as a catalyst that definitively affected the development of both Texas and countries around the world. The exhibit narrative will connect the Texas legacy of *La Belle* to the present day with a distinctly Eurocentric flavor. In addition to describing the ship-era Prehistory and Early Encounters – both terms that reflect European rather than native chronologies, as Wolf (2010) would consider – the gallery will also display the process of conserving the collection with examples of molds, casts, and concretions described with large photographs. The new exhibit is in this way part of an entire floor being redesigned after

fourteen years, in which by showcasing *La Belle* the museum delivers on its plan to expand the interpretation of Native American history and material culture. The final exhibition is also planned to showcase an overall sleek look, with most cases positioned along a wall and a few free-standing cases housing metal or glass objects. Like all galleries in this museum, the rotating nature of collections provide curators with a "chance to continually update the contents" (Mabel, 7/20).

The museum curators prefer a display period between six months and two years for any given exhibit (a conservation need as well), and in the case of *La Belle* the artifact contents may change around 2018 or 2019. Specific exceptions include more limited display time for textiles (one year) and documents (six months). The curators also recognize that the eventual *La Belle* displays will be more technically complicated to install and remove, and this has guided the quality of the conservation and collections care work such that artifacts will be ready to withstand display for decades to come, they hope. Once the ship is enclosed in glass, the conservator and curators anticipate being able to change out objects on display through an access hatch door without accessing or disturbing the hull itself.

The gallery projects a fifteen-minute reel of footage taken during the magnetometer survey and cofferdam excavation, highlighting the hard work of the twenty field crew members.[12] This first floor gallery exhibit opened on 8 August 2015 and presents a small version of the permanent exhibit which will surround the ship hull (Mario, 7/24). The hull reassembly was completed in 2016 and the planned exhibit will transform the former conservation workspaces into cases and panels for displaying objects. As stated by the project director, the

[12] Portions of this footage are shared by the Bullock Museum on social media: "La Belle Shipwreck - See the Story Unfold Live at the Bullock Museum" (2014), https://youtu.be/zVd0-OOWSt0

exhibit expansion will make use of the careful updates to the conservators' Access database that the Collections Manager has contributed in the course of curating the collection (that is, compiling and aligning data contributed in turn from the design firm and from the conservators). *La Belle* remains a complex project because of the multiplicity of participants involved over its twenty-year history, and as one interviewee stated, "the data is never done!" (Mario, 7/24). The same is true of metadata, and as some objects rotate into the exhibit there will be a continuing need to create exhibit labels based on field and conservation data about those objects. The repository and the museum communities will both contribute to this effort. One of the more problematic aspects of *La Belle*, characteristic of nautical projects, is the continuous arrival of new artifacts being discovered as conservators open the hundreds of concretions excavated from the cofferdam. On smaller projects, archaeologists can be very precise with their dataset, but because this project is more complex, the work of the conservators shows that precision for this collection will remain a moving target for years.

Having introduced the sites where I will examine curation activities, I return now to the literature I presented in Chapter 2 where we see that scholars Sullivan (1992) and Barker (2010) are introducing a new way of thinking about the museum's role with regard to managing its collections. I encountered a museum site addressing these and related issues in the course of working with objects from a particular collection. Certain collections created from archaeological discoveries carry multiple cultural and historic meanings and it is incumbent on museums to respect these views and work collaboratively with parties to establish the ultimate disposition of found objects. The museum perspective provided me with a cohesive setting in which to see how curation activities resulted in an exhibit. In the section below I discuss my approach to data analysis and why I study both objects and documentation about the objects.

DATA ANALYSIS

Units of Analysis: Object and Documentation

I collected heterogeneous data in support of understanding a single phenomenon (archaeological curation), including observational data, photographs, speech and interview recordings, database records, and documents used in the course of this work. The data I collected in the course of my observations are distinct from data created by my study participants, which include context sheets, site photos, databases, and database records. In some cases, the two will overlap (e.g., a sample context sheet or conservation card), but in other cases (e.g., my interview transcripts) they remain separate. I describe the data created by my study participants collectively as "accompanying documentation," and seek to understand their changing appearances in my RQ3. Sullivan and Childs (2003: 87), who refer to these similarly as "associated records," draw a notable distinction between these records and the archaeological objects themselves, arguing that too many archaeologists have just focused on the objects and have ignored these associated records when arranging for the long-term preservation of their excavation project. Other scholars use the related terms "archaeological archives" and "excavation records" (Swain, 2007: Chapter 7). Childs (2016, Mar. 31 communication; Kirakosian et al., 2016) is actively investigating the readiness and ability of repositories to accession associated records now being presented to them in a multitude of digital formats, including GPS, GIS, and digital still and moving images. My research considers both object and documentation to have equal importance. I recognize that as a participant-observer (in at least one of my research sites), my situatedness afforded me neither a

purely insider (emic) nor outsider (etic) perspective on my central concept, as I drew on my knowledge base both prior to and after observing.

In preparing to study objects, I examined the cultural biography of objects approach that has been practiced in the archaeological field. Gosden and Marshall (1999) situated the concepts of use-life and life-history along a line of biographical thinking in archaeology that has also long been part of the functional core of museum work, they argue, through exhibit labels and catalog records (discussing a Fijian necklace as a case study). Hamilakis (1999: 304) accentuated how this "bottom-up perspective which elucidates the complex entanglements of archaeological production" gives a fuller portrayal of objects that the public may find culturally "interesting" or controversial in some way, such as in his case study of the Elgin Marbles. After completing my data collection I transitioned from this kind of object orientation to a broader occupational lens which allowed me to look beyond a particular object path and instead examine what structural issues between communities of practice had shaped that path.

For my analysis, I juxtapose data collected from different sites that facilitate archaeological curation. As I do not follow one object across all sites, the analysis is ultimately comparative rather than sequential. Below I expand on the qualitative techniques I used to analyze these juxtaposed data.

Analytical Techniques and Emergent Themes

In this section I introduce the analytical approach I employed to carry out the writing of my research results, presented in Chapter 5. As I had anticipated, I obtained heterogeneous data from my research sites in the form of object-specific photos and documentation, detailed written observations of work practices, reflections on past practices, insights about challenges faced, and

recommendations based on these experiences. Both during and after completing my data collecting activities, I began to synthesize and analyze the data qualitatively, referencing the patterns outlined by Emerson, Fretz, and Shaw (1995) and the observational details of "thick description" (Geertz, 1973). I assembled a rich set of fieldnotes including text in notebooks, images in photographs and record printouts, and spoken audio in interview recordings. I hoped to identify themes in this analysis that could provide cohesion to the results, so that I might eventually be able to compare practices across sites, and see where problems occur. I determined to follow the guide of Corbin and Strauss (2008: 66), specifically using the "thinking strategy," or analytic tool, of asking questions of the data to tune in to the issues and definitions of interest to my interviewees. This process is much the same as the "open coding" concept that Corbin and Strauss use more explicitly in the first two editions of their book, where coding is the process of identifying concepts and themes emerging from the data. I examined the content of these fieldnotes at a high level and determined the extent to which they contain data useful for illustrating collections management activities. At this early stage I recognized that several specific activities I had observed played a role in facilitating institutional practices (for example digitizing paper records, or moving boxes of lot-cataloged materials to new locations) but shed less insight into the overall practice and profession of archaeological curation. I did not ultimately include such activities in my analysis here, though I may return to them in my future work. I did allow for emergence of all pertinent parts of these data that related in some way to curation, and from these data I identified mini-activities that make up archaeological curation at the institutional level.

Having identified these mini-activities (e.g., writing a conservation card, enumerating timbers), I grouped these into four work activities (constructed categories) – and immediately

discovered two key insights: (1) the activity of curation was not limited to just the institution that is charged with carrying these out (i.e., a repository), and (2) between these activities I could identify handoffs (points of transition) where changes in recording practices occur. The four categories (excavation, conservation, collections care, and exhibition) were part of my framework of site selection and they also emerged from my data analysis (after also seeing the activities overlap at sites where I did not expect to see them). I admit a certain circularity in this regard but would maintain that the reinforcement of these categories provided me with the organizational structure but not the content of my findings in Chapter 5. My use of the methods I have described led me to pursue further explanations of both the specific and the overall nature of what happens when these activities transition from one to the next – explanations or themes which constitute my core findings (the notion of a discontinuum and of handoffs). Before I collected any data, I believed that multiple professions were involved in archaeological curation (RQ1), and I sought to understand the overall nature of any interactions between these professions (in RQ2) and how documents changed from one point to the next (in RQ3). I was not able to articulate detailed reasons or answers to any of these lines of inquiry until after completing my data collection and analysis. As I read through my pages of fieldnotes I wrote jottings that captured my interpretations of these data and suggested several themes for pursuing further synthesis. Below I present one example of my analytical process of asking sensitizing questions of my data, taken from my research notes. The first paragraph is a transcribed quote from an observation I completed with a participant at site #3a. The second paragraph contains the sensitizing questions I wrote for myself as I read through this excerpt and began my analysis. I present this example so that I might make explicit the process I used to prepare some of my textual data for analysis.

Qualitative Analytical Process:

Fieldnotes, Conservator: "[viewing remaining loose timbers for matches/joins]: Some pieces are going to be unknown and that's just a curatorial nightmare, that happens with broken wood in vats that's transported 180 miles. ... And that's it [for the conservation card]. So that's really not enough to manage seventeen years' treatment of a piece of timber, so that's why I'm just going to collect all my notes, all the notes I have in places throughout: back at the lab fifteen years ago to now. They're in a filing cabinet. But it all depends on who was doing it: this [documentation] started the *second* it came to our lab. Anything the archaeologists did, well [is not here]. In fact, I just said before he left [the project], 'Can I have all the rest of your notes?' I finally have a full set of notes that I've never had in eighteen years. And that's all there is to it. These cards are the responsibility of the conservation lab. If anyone researched a couple articles regarding treatments, that might go into our folder as well along with the card, the x-ray, drawings, depending on how complex is the artifact." (12 Nov., 3:40 p.m.)

Analysis, sensitizing questions: What is the issue of most concern to the conservator? What is going on with information transfer across the archaeological project? Why is this transfer uneven? Are the two main actors here the archaeologist and the conservator? If this is a handoff point, what might facilitate better information transfer between them? How could we leverage their existing communication practices to make documentation a bigger topic of concern? What is taking top priority instead? How does the conservator define curation (note: nightmare). Which of their actions have consequences for *other* professionals doing curation?

Before I began analyzing this particular example from my data, I had only an open-ended question in mind, "What work do conservators contribute to archaeological curation?" I let my interpretation of my interviewees' words guide me toward eventual emergent themes and the notion of relationships (or missed opportunities for such) between and across activities. Many other interesting ideas and questions could also be mined from this example, which is characteristic of the richness in my data. As illustrated by this example, my analytical process of memoing and question-asking allowed me to reinforce four known categories – excavation, conservation, collections care, and exhibition – within which the mini-activities I heard described by my interviewees were a part, as well as to put forward two eventual master themes (core findings). It began to be obvious that these categories transcended the institutional mission of my research sites, and some mini-activities fit into more than one category (such overflow and overlap emerged only after my data analysis). With these categories in hand, I sought to reach the point of "final integration" (Corbin and Strauss, 2008: 283), that would tie together my categories into a plausible explanatory framework about the practice of archaeological curation. I reconciled the multiple perspectives my interviewees had presented in my data, and it became clear that all were doing particular activities regarding the care of archaeological objects and documentation. It seemed that an overall framework for my research study might be seeing whether there is continuity here or not. Waiting to identify this master theme until I had read through each set of data from my research sites and clustered the mini-activities into constructs in my analytical memos ultimately made it possible for me to analyze the full heterogeneity of my dataset. After this thinking strategy, I integrated my categories by linking four work activities around my core findings of a "discontinuum" and of "handoffs." (Although a gap suggests

discontinuity, and a handoff suggests coordination and success, I use the latter term based on evidence of ongoing efforts and support for future work around these issues.)

The question-asking, memoing, and category construction I carried out for my datasets permit me to argue in my analysis that multiple work activities are performed by contributors who do not work under a single overriding concern for archaeological curation (or even, a shared definition of this word). Rather, the archaeologists, conservators, collections managers, and exhibit creators work according to their specific profession's concerns and disciplinary roles regarding collections care. Writing my findings in this way also supports the adjacent analysis I offer in the form of recommendations and future research directions from my data, which I focus mainly around the museum studies discipline. With Chapter 5, I attend to the multiplicity of sources whence my heterogeneous data came, and the unique role of each kind of research site in the total enterprise of archaeological curation. Each example of documentation is an occupational work product, and I place these examples in the context of my view that curation work spans the field site to the museum. The results illustrate the occupational provenance of curation activities.

In presenting my findings, I anonymize the names of those individuals I observed and interviewed at all of my sites: from the classical and contract excavation teams to the museum. I chose for purposes of readability to remain consistent in using pseudonyms throughout this document, even in recognizing that the professional staff involved with the *La Belle* excavation at the conservation laboratory and state museum are internationally recognized for their work. I reviewed relevant findings with all individuals following the IRB approval specifications for this research project.

In Chapter 5 below, I present a three-part argument based on my three research questions. In the first section of the chapter, I explore what actors are involved with archaeological collections and I specifically focus on articulating the curation activities each community of practice carries out. In this section I argue that curation begins with excavation (contrary to the museum focus) and that museums and repositories do very different activities related to curation (even when they are co-located, and contrary to the tendency to view them as equals). Having established that curation is occurring in multiple places, I next investigate how these actors function together. I explicate my two core findings, first of the overall pervading effect of a "discontinuum" for present-day archaeological curation work and then of the presence of multiple handoffs of documentation between these professions. These latter two sections of Chapter 5 are interconnected as they allow me to argue that the reason why a discontinuum exists is because of the presence of these handoffs. Moreover the handoffs are problematic, and have implications for structuring future data interactions between these four communities of practice. I expand upon these implications, the major contributions of my research, and future research directions based on my notion of a discontinuum in Chapter 6.

5. Research Results: A "Discontinuum" of Distributed Curation Work

OVERVIEW

With this chapter I reconceptualize archaeological curation as multi-disciplinary work performed by excavators, conservators, collection managers, and museum exhibit makers. This reconceptualization argument expands the scope of museum archaeology to include activities that occur outside of the museum space (specifically excavation and fieldwork) and it allows me to converse with scholars such as Sullivan and Childs (2003) and Barker (2010) who are actively contesting the concept of curation – claiming it for archaeologists and museum curators, respectively. Within this overall argument I present two core findings: curation occurs in a discontinuum, and data handoffs constitute the discontinuum. At the outset of this chapter, I will define some of the terms I use here. "Archaeological curation" is an established term (more compact than, though synonymous with, in my view, "archaeological collections management"), and when I use it in this project I mean the entire spectrum of activities concerning the preservation of cultural heritage in the form of material objects (Avrami, Mason, and de la Torre, 2000). The word "curation" I believe captures the pervasiveness of activities across multiple professions, but my usage of it in this way means that I must refer to the more specific, skilled work of a collection manager with a different term. Susan Pearce, in her *Archaeological Curatorship* (1990) discusses the collections care duties of a professional curator, and so as a matter of continuity I have decided to call the specific work that happens in an archaeological repository "collections care." Again, my goal in defining these two terms in this way is to distinguish the entire spectrum of activities (archaeological curation) from the work that happens in specialized archaeological repositories (collections care).

I find that multiple participants have divided the work of archaeological curation, and I name this core finding a "discontinuum" of professions. Each participant, I find, carries out particular activities in order to meet the expectations of *one* (his or her own) community of practice. The participants are only connected to each other across communities of practice at specific "handoffs" – my second core finding. I analyze four handoffs here as critical junctions where one professional must be able to communicate to another. There are two communities involved in each of these handoffs (e.g., communities 1 and 2), and in general, we see that community 1 differs in their practices from community 2.

These differences include using multiple kinds of software and databases that seem to have "dueling" purposes, but the reasons I posit for the discontinuum are more occupational than technical. Each community brings to bear a particular epistemology in the process of generating object data, which is strongly connected to the occupational system of rewards and punishments to which that community member subscribes. Archaeologists approach artifacts and archaeological collections based on their search for patterns of site occupation or societal use of the artifacts, while conservators are concerned with material science, and exhibit designers desire the arrangement of artifacts and research into a compelling narrative (all of these approaches overlap, but it is a matter of one approach being in the foreground). I find that a community's database design reflects their use of particular tools to create data in particular formats. The end result is a lack of interdisciplinary agreement and the nonexistence of consistently applied standards for curating archaeological collections. I found that a discontinuity pervades the whole activity of archaeological curation because four handoffs – which I will analyze individually as Handoff 1, 2, 3, and 4 – compel participants to (1) reformat and reconfigure data received from

an earlier participant, and (2) keep a copy of the participant's own data for their own future work and research interests.

What this discontinuity means is that an increasing volume of documentation is created about each object (but not necessarily passed forward) as the object becomes further and further removed from its excavation (or, the more it is "curated"). Additionally, the documentation flows in one direction, and new information in later stages is not transferred back to the field archaeologists. I explore why four communities continue to produce non-interoperable data, and I find that the presence of handoffs exemplifies and reinforces separate communities of practice. I argue that such myopia ultimately hampers the aspirations of making archaeological curation a broad societal endeavor, a true interdisciplinary collaboration. These communities currently exert labor only at points of need to overcome the issues these handoffs present. With this research, I can identify not only who is involved but why they are involved, showing that the contributions actors are making now (with technologies) impact the curation responsibility in entirely new ways that disrupt the notion of a continuum. I use "responsibility" purposefully, in the sense of the case made by Childs (2004) that archaeologists should make collections care a more vital part of their professional enterprise.

The organization of this chapter in three sections corresponds to the scope of my three research questions. I first analyze who are the actors involved in archaeological curation, by examining what individual activities my participants perform with regard to curation and their sequential location as a unique contributor of archaeological curation data. I find that four communities do curation activities, that each activity informs the other, and that each participant contributes different data about objects (contributions beyond what I anticipated in my Table 1 earlier). The second and third sections of the chapter are mutually concerned with articulating the

reasons why these four communities do not function well together. In the second section I characterize the curation contributors as a "discontinuum." Third, I find that the problems of the discontinuum are instantiated in the presence of four specific handoffs, which are part of the discontinuum. The transfer of documentation breaks down at four handoffs (at least; more than four are possible), each a point where one community interacts with another community. I focus my analysis specifically on data format problems, arguing that "dueling databases" shape each community's relationship to its data in distinguishable ways. Persistent occupational investments in a database created to answer discipline-specific questions create documentation handoffs which ultimately make a smooth continuum impossible. In the following chapter I explore why the continuation of a discontinuum is problematic. The findings reveal specific opportunities for future research in two directions: community-building efforts around archaeological curation, and examination of other communities with similar structures in place.

CURATION CONTRIBUTIONS BY MULTIPLE PARTICIPANTS (RQ1)

Four communities of practice contribute curation activities – excavators, conservators, collection managers, and museum exhibit makers – with each one associated with a single key activity (excavation, conservation, collections care, and exhibition, respectively). The Morgantina, *La Belle*, and contract archaeology projects I have introduced each contain a combination of these four activities. Unlike the single-site structure of the Morgantina excavation (including mini-teams), the *La Belle* project involves four different institutions or sites: the museum being the one through which I explored the other three. The *La Belle* activities have proceeded in a general linear sequence, beginning with the excavation in 1995-1997. While

completing my data analysis, I determined that different portions of my data are best suited for answering each of my three research questions that are the focus of this study. When I analyze excavators' curation activities in the first part of this chapter I draw exclusively on the 2015 Morgantina excavation (and not on the *La Belle* excavation of 1995-1997). My first research question is concerned with who participates in curation work; after discussing the excavators at Morgantina in this way, I transition to the *La Belle* project to discuss the other actors. My discussion of the Morgantina excavation in this study is limited to the analysis of excavators' curation activities that I present in the first section of this chapter.

Since my second and third research questions are concerned with the nature of inter-professional interactions, I choose to analyze data I obtained about four professional communities. What I find is discontinuity between these interactions, and I present as the core finding of this study the notion of a discontinuum between communities. The discontinuum is primarily characterized by data handoffs that do not proceed smoothly. Three such handoffs are drawn from my data about the *La Belle* project (Handoffs 2, 3, and 4) and one handoff is drawn from my data about the contract archaeology context (Handoff 1: from excavation directly to collections care). Other handoffs are possible among these communities of practice, though I choose to focus on these four. While both the contract archaeology and the *La Belle* project contexts involve multiple communities, I find that the Morgantina project is ultimately comprised of one community (excavation). Based on this premise, I limit my data analysis from Morgantina to the issues raised in my RQ1 regarding the key activities of curation actors. The mini-team exchanges at my research site of the Morgantina excavation do not rise to the level of inter-professional interactions. While in this dissertation I do not analyze intra-community handoffs, I outline what a study of team functions within an excavation might contribute as a

future research direction in Chapter 6. In Table 5, I identify which activities are involved in each of four data handoffs I analyze, and the project context – *La Belle* or contract (CRM) archaeology – from which I draw my analysis. As indicated by the arrow, each handoff originates with the community listed in the left-most column and then positions a second community in a recipient role (who rarely shares or recirculates new results with the first community), an issue to which I will return. My notion of a discontinuum is based on specific problematic handoffs of data occurring between the following activities:

Table 5. Curation Activities Analyzed in Four Handoffs of the Discontinuum

	Excavation	**Conservation**	**Collections Care**	**Exhibition**
	→			
Contract archaeology	Handoff 1		Handoff 1	
La Belle	Handoff 2	Handoff 2 Handoff 3	Handoff 3 Handoff 4	Handoff 4
Morgantina	*analyzed in RQ1 only*			

Excavators

The first community of practice to interact with objects is the excavators who record detailed and complex information about archaeological resources. Excavators generate data and documentation during excavation, assessment, analysis, and dissemination in project reports. Excavators record data about contexts (layers of soil), about objects (called Finds), about the physical appearance of a trench, and about the interpretations of what each object and site feature is in a historical sense. Data take the form of paper context sheets, digital records in a database (with descriptions and scientific measurements), digital photographs, sketches on paper, and text

written on paper and in digital form. Only some of these kinds of data are captured in digital form.

Since the 1990s, excavators' (archaeologists') data practices have encompassed multiple paper and digital formats. Some American excavations began to adopt direct digital recording into mobile devices in the field after 2010. At Morgantina, my site #1, supervisors began developing a relational database in 2012 to link data produced by all site team members, and adopted a hybrid paper and digital field data recording strategy beginning with the summer 2014 field season, enhancing the system for 2015 (when there were 43 total team members). Archaeologist Lacey led the implementation of the site's digital program by testing off-the-shelf products. Lacey "started using those to our advantage and figuring out how they would be useful for us," and found that the availability of power in the field and mobile computing stations would be important to this success. Now in the role of Data Supervisor, Lacey noted, "Now we're in excavation seasons and it's nice because you don't have to have people sitting at computers anymore typing Context Sheets into a digital structure. You don't have to have them transferring handwritten notes into a digital structure. They're [the sheets and notes] all there already." (Lacey, 2/13). Digitized records suit the excavators' needs, but no other community's needs, to access data from past seasons.

Problems arise outside of the excavators' community, where the constraints of the digital structure that the excavators used become very apparent. Members of another community of practice would approach the excavators' data with a different set of research goals but these non-excavators find that only data related to the excavators' interests have been captured in digital form. That is, some information that was not digitized is that which is most useful to a non-excavator (examples include pencil sketches, early drafts of interpretations, and notes on trial

efforts). This non-excavator now must bypass the digital records and seek out instead the informal handwritten notes (which the excavators keep during the season and transfer to the project archive at its conclusion). Digitization does not improve the usefulness of the excavators' data to a community of practice outside of the excavation project, given that the explosion of formats and complexity is not bringing excavators any closer to a universal standard (a standard which would still be mainly for excavator questions). The excavation at Morgantina generates complex data, when we consider the minute-by-minute observations written and sketches drawn in the field, trench photographs of features and stratigraphy, aerial geospatial records, and measurements of finds and environmental analyses. These data shape and impact the course of the work both that day (i.e. time spent on documentation) and the next day (i.e. directing resources to particular locations). We will see next what data the excavators find useful and in particular what data they choose to digitize and what they do not. In the section below, I discuss how the relatively recent adoption of tablet computers across an excavation distributes the task of creating data to different teams but centralizes the data curation responsibility with a single Data Supervisor.

Data Team: Syncing Curation by Field Teams

Excavators work in five teams at Morgantina – Data, Dig (Trenches), Museum (Small Finds, Ceramics, Conservation, Environmental), Geospatial, and Architecture – to identify the categories of data gathered in their work, and the optimal ways of accessing data to carry out daily activities. In implementing the tablet computers in 2014, the Data Team distinguished seven categories of data generated in the course of the excavation project, and how they might be captured in digital form. The Data Team, led by a Data Supervisor, demonstrated how

excavation-wide use of digital device technologies might enable excavators to share data and review the quality of all of the team members' data in a way that was not possible with paper notebooks. The resulting dataset would be collectively richer and more complete than the data previously contained within a set of individually-kept paper notebooks.[13] The database started as a way of recording Small Finds; since 2013 the Data Supervisor has expanded database capacity to include seven categories of data records:

1. Inventoried Finds (museum work),
2. Contexts (fieldwork),
3. Media (photographs),
4. Science (environmental results),
5. Pottery (ceramics),
6. Storage (locations), and
7. Conservation (treatments).

The Data Team has constructed these categories in the same database in response to the particular work carried out by each of the other four teams within the excavation. The seven categories are thereby specially tailored to the excavation itself. A Team Supervisor is responsible for creating the records in the category of that team, but the Data Supervisor is ultimately responsible for curating all these records as one dataset. The Science category, for example, includes the data generated by the Environmental team as they analyze archeobotanical and zooarchaeological samples such as from soil, bone, or charcoal – this category, as well as Finds and Pottery, is linked to particular Contexts. The inclusion of each category of data is a reflection of the different teams that have been organized specifically around creating different kinds of documentation (e.g., photography is completed with one main excavation camera rather than by all team members). It is important to note that there are very few records, apart from

[13] This argument relies, perhaps problematically, on adherence to the idea termed "Linus' Law", a claim that "given enough eyeballs, all bugs are shallow" (Raymond, 1999).

Inventoried Finds and Contexts, currently in the digital database for data generated prior to 2013. The absence of this legacy information is a data entry issue only, but it does affect perceptions both within and especially outside the excavator community of how useful the digital database is for certain purposes. In particular, non-excavators have research interests in the excavations carried out in the 2000s, 1990s, 1980s, and earlier – and for at least five categories, data from areas of the Morgantina site that are not currently being excavated are not yet accessible in digital form.

The role of the Data Supervisor is to perform data curation, specifically, to create one single excavation dataset from all five team contributions through a process I will analyze called syncing. The Data Supervisor is responsible for managing the database and the tablet computers distributed across all five teams within the excavation. The Data Team supports all members of the project on a daily basis by distributing one or two child copies of the FileMaker Pro-based database on a tablet computer to each of five teams' supervisors (there are eight to ten tablets total). Each team supervisor uses a tablet during the day to create data, and at the conclusion of the day returns the tablet to the Data Supervisor for syncing with the parent database. The tablets are identical in physical material and digital content, and individual teams are instructed to contribute only new information that their team works on during that day. Only Data Team members may work with legacy data from prior seasons that are relevant to current dig activity.

One person, the Data Supervisor, is responsible for organizing and preparing devices, and ensuring that all data are collected and handled accurately. Specifically, the Data Supervisor assumes responsibility for carrying out the sync process, which involves up to twenty device interactions each night: once to copy each child file onto the server, and again to place the new

revised child file on each tablet. The act of "syncing" each night updates the data that a person will see from day to day, and results in an entirely new database with different content upon inspection the next day. By looking for changes in the child version, this process relies on sync scripts written to make the parent-child database communication proceed without errors and without needing to export the full database. Each sync script examines the seven types of data records and generates a message reporting the number of: record conflicts, new records, and edited records. The sync scripts move data from different devices to a central copy of the database. Below are four examples of the data obtained from syncing four devices that the Data Supervisor would review as new potential additions to the master database. Figure 2 presents an example of a Small Finds record as displayed in the tablet computer.

Example 1 (*Field tablet*): Context Records: 1 new record, 0 conflicts, 0 edits. Small Finds records: 5 new, 0 conflicts, 0 edits. Bulk Finds records: 0 new, 0 conflicts, 1 edit (rubble from 4 wheelbarrows' full of sifted dirt). Architectural Finds records: 5 new, 0 conflicts, 0 edits. Conservation records: 0 new, 0 conflicts, 0 edits. Storage records: 0 new, 0 conflicts, 0 edits. Soil Sample records: 0 new, 0 conflicts, 0 edits.

Example 2 (*Environmental tablet*): no other changes besides Soil Sample records: 2 edits.

Example 3 (*Museum tablet: member working with Small Finds Register book*): Small Finds records: 152 new, 0 conflicts, 0 edits.

Example 4 (*Museum tablet: member measuring Small Finds*): Small Finds records: 0 new, 3 conflicts (Greek characters), 71 edits (new object measurements). Conservation records: 2 new, 0 conflicts, 0 edits.

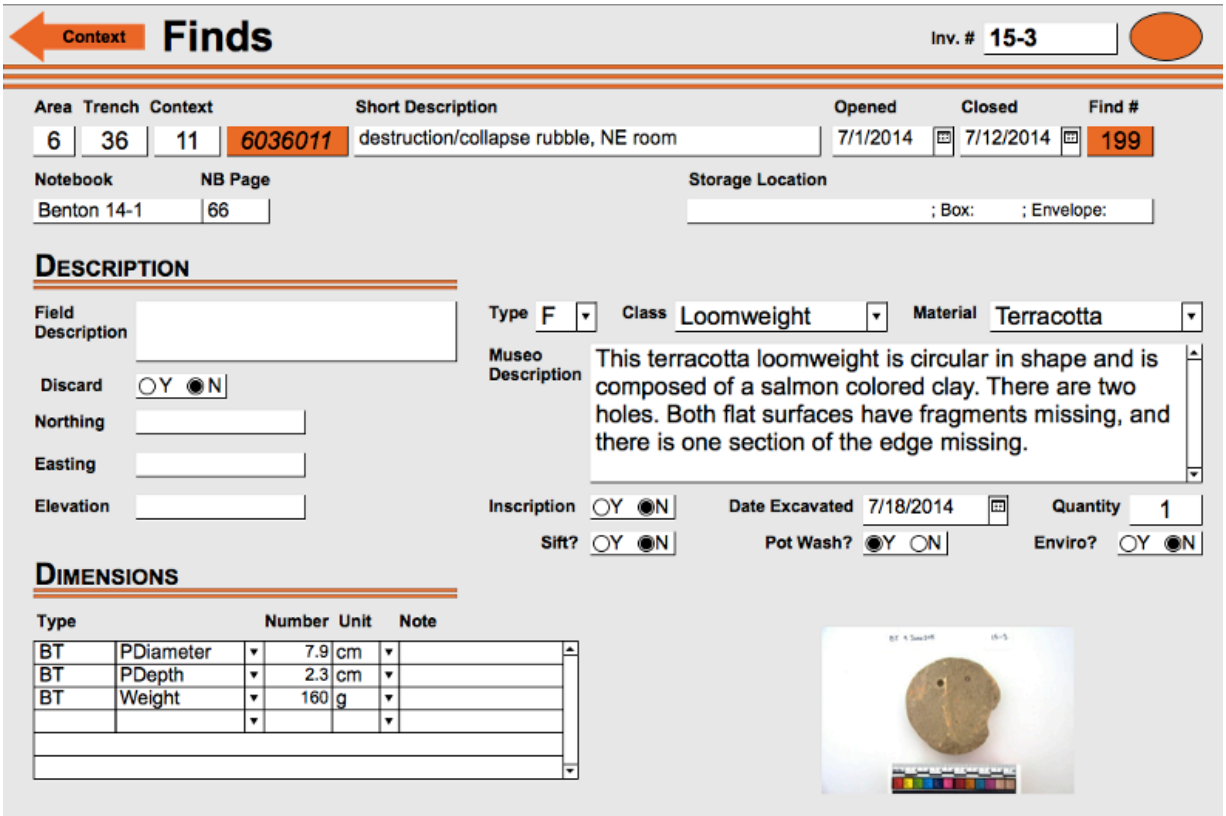


Figure 2. 2015 Data Entry Form for Finds Record.

The Data Supervisor knows that Trench Supervisors may distribute data recording tasks among the excavators working in their trench (e.g., to give undergraduate excavators experience creating digital data) and takes this distribution into consideration when performing the data curation, that is in reviewing changes made to database records because the software does not capture names of who authored a record. The Data Supervisor puts the onus on the Trench Supervisor to ensure that only Trench Supervisor-approved changes are entered into a child copy of the database. Based on her understanding of who handled the device that day, the Data Supervisor reviews whether to approve particular changes. Capacity to reject particular changes is built into the sync process but is rarely if ever used; the Data Supervisor always approves all of

the day's record changes and thus integrates these new data into the master database that is then redistributed out to the supervisors the next day. The Data Supervisor does back up and store each of the database "dailies" in multiple locations.[14] It is possible to go back to a particular daily version and manually redo changes later found to be incorrect or accidental.

I maintain that in syncing the data contributed by supervisors of the five teams, the Data Supervisor makes curation decisions that have a great deal of impact on the future research potential of the data. Although the Data Team has special data responsibilities as I have outlined, all teams do data curation tasks. Yet the responsibility of amalgamating data generated by the various team activities across the excavation falls to one Data Supervisor, who has not been present at creation of the data. Museum Team members working with Small Finds, for example, capture photographs of excavated objects before and after conservation treatments; they then link the photographs to relevant object records in the single excavation database.

In this section I have examined how a Data Supervisor curates complex data created by five teams on an excavation. This curation work involves amalgamating data updates from ten tablet computers on a daily basis, which constantly enlarges the resulting database. Whether the database is more complete as the season progresses is a matter of perspective, because this continual striving for completion is premised on a specific set of research questions. The database structure represents one archaeological project's pursuit of particular kinds of archaeological data, through the data curation work performed by the Data Supervisor. I noted how the Data Supervisor originally created the database in 2013 so that the Museum Team could record data about Small Finds. In the section below, I examine how another of the five

[14] As befits digital preservation best practice, the cumulative excavation dataset is stored on at least two servers located on different continents.

excavation teams, the Dig Team, records data about field contexts, that is, stratigraphic layers in a trench. Through the next two sections, we begin to gather a fuller picture of how excavators as a community of practice begin the process of archaeological curation by using technologies to record specific data about the objects they excavate.

Dig Team: Creating Field Context Records in a Digital Database

Since implementing a hybrid paper and digital recording strategy in 2014, the Data Team has expanded the number of participants contributing to the shared dataset, but also introduced just as many opportunities for one to see that these data are inconsistent, namely uneven in coverage or quality. The time-consuming nature of the sync process is designed to spot these inconsistencies much sooner than would be possible with paper notebooks and, most importantly, to make efforts to get these inconsistencies "corrected" or fixed before more progress is made on the dig. The Dig Team members generate the largest quantity of data of all five excavation teams. The Dig Team is led by pairs of Trench Supervisors who direct the work of excavators within a given trench area each day of the fieldwork season. All Trench Supervisors use the same terminology in generating these data: a *context* is an individual stratigraphic layer within an area of the trench. Each context in the database uses the Context ID (CID) field as a unique identifier, and the CID number includes three components (area, trench, and context):

e.g., CID 6 028 001

area (6), trench (three digit, 028), context (three digit, 001)

The area number refers to the large section of land on the Morgantina site in which the current excavations occur, and the trench number refers to the defined area (usually square)

within that section currently being excavated. In addition to recording area, trench, and context, excavators are responsible for adding a short description of the context based on direct observations they may make, often in draft form first in a paper field notebook. Handwriting legibility becomes an important issue in transferring information originally written in paper form to database form. Only the Supervisors (Dig [5], Data [1], and Museum [1]) are instructed how to set up new context records in the database, and students are supervised when adding data to context records during the day (the database is set up to save data automatically, which reduces the possibility of losing work). Again, the Data Supervisor oversees the digitization of data contained in paper context records (pre-2014) of the Field and Museum Teams into the database. In contemplating this activity more broadly, we see here that the Data Team is basically performing "data cleaning"[15] (e.g., eliminating sketches, draft narratives, and preliminary deductions) on the original data captured in paper notebooks. Notebook data may be useful for the Trench Supervisors who wrote them and who return to notebooks during and after the work season, but the Data Supervisor does *not* find notebook data in "native" paper format useful for purposes of synthesizing and drawing out site-wide archaeological patterns. We see here a format issue where the notebook data on paper is not interoperable with the way the digital data structure has been set up, even though the content (on the paper) is desirable for the Data Supervisor's purposes. Yet, the supervisors continue to create paper notebooks, and the Data Team continues to strive toward a "complete" database containing all of the data known about a trench and its archaeological contents. Despite the efforts of the Data Team to build a complete

[15] This term is adapted from Dasu and Johnson (2003) and its use here refers to normalizing inconsistent data upon its digitization.

database that is useful for the entire site, we will see that the database is insufficient for later communities of practice.

Nonetheless, the database is actively growing, and it is an emergent artifact. Because it has only been in use for two field seasons, the characteristics of the database are likely to continue to change as more team members recognize possible uses and affordances of the database as a research tool. Prior to 2014, all the data currently captured in the database were recorded on paper sheets, and the transition process to creating digital records for many team members is ongoing. The database is being built out while the excavation proceeds, and the attainment of its full potential will require adoption by *all* team members (a beginning-of-season workshop is planned for the 2017 season). The Data Team has also not habitually had a large number of team members, as most of the participants have in the past been assigned to the Dig Team. The project director and Data Supervisor have outlined a series of desired tasks they would like to be completed, using "many sets of data" that have been generated over many years to answer specific questions about the history of the archaeological site.

Trench Supervisors spoke about using the paper notebook and the digital tablet computer for complementary but not always identical purposes, including day-to-day interpretation of the day's trench work and season-end summation of trench discoveries within the whole site area. The Trench Supervisors see the paper notebooks serving an important function in facilitating narrative thinking and providing a "freehand" sketchpad for processing these ideas and making initial drawings about site features. The digital database is most useful as a ready resource for keeping track of dozens of contexts (layers) and for sharing Trench Supervisors' descriptions and interpretations. These perspectives on the differential affordances of paper and digital media reflect the distinct epistemological approach that excavators bring to their work. The meaning of

artifact finds to excavators often derives from the finds' value as evidence of a pattern or life practice of the civilization that created the object. Excavators may deduce from any one artifact evidential value, and record their deductions in both paper and digital formats. The excavators' epistemology relies on this continued access to collections material because excavators are continually constructing and reconstructing their claims. Excavators maintain their own paper and digital archives of excavation materials so that they may themselves continually access the materials to carry out archaeological research. These practices, even with internal variation, form the excavators' community of practice.

In the following sections I articulate other curation practices that different participants complete and record data about: the conservator examines the objects' changes over time and materiality, the collections manager desires "scientifically accurate" artifact descriptions, and the exhibit designer seeks to present a particular scholarly lens (often but not always different from that of the archaeologists) through which visitors might contextualize the artifact and its place in local or national history. Each practice exists in wholly different professional settings and is the product of disciplinary ways of thinking that my participants have, some more critically than others, internalized and instantiated in their work. Excavators approach objects with certain expectations regarding how to create documentation to capture the excavator's evolving interpretations as an object is excavated from the ground. As we will see in the next section, conservators approach objects with a different set of purposes; specifically conservators contribute curation data by completing the excavation of objects through applying special techniques in a controlled laboratory setting, in the course of particular object stabilizing, cleaning, and reconstructing activities.

Conservators

An underwater survey discovery in summer 1995 in Matagorda Bay commenced an archaeological excavation project of unprecedented methodological complexity and richness of the artifact assemblages. The excavation of *La Belle* and its artifact collection by a team from the Texas Historical Commission began with the discovery of a bronze cannon, which bore the crest of King Louis XIV. Over the next two decades, conservators carried out an ambitious program to conserve the hull of this ship and perform conservation treatments on a total volume of over 1.6 million objects recovered from the ship in a range of materials, sizes, and chemical composition (Hamilton, 1998; Carrell, 2003). This section will focus on the importance of conservation treatment documentation to archaeological curation and the ways in which conservators contributed to curation at my research sites. Professionals at the state museum and conservation laboratory research sites perform not only conservation, but also some key activities of excavation and exhibition. In this section, I focus not on the complex excavation of the *La Belle* ship but on the very important conservation work that occurred afterwards and the creation of conservation documentation. We will see that conservators create data about treatments (on paper conservation cards—and these "treatments" may constitute a final stage of excavation), object material and quantity (in an Access database), and object appearance before and after conservation (in digital photographs). The community that conservators hand such data over to, repository collections managers, will have to translate this close object-level description into a broader provenience-based relational database that preserves and places an object within the context and scope of a collection that numbers 1.6 million objects.

A Conservation Database "Dueling" with an Excavation Database

Conservators created an entirely new database separate from the one created by the excavators of *La Belle*. The conservators found the data presented in the excavators' database to be structured in ways that were useless to the conservators' needs, and so agreed to create a new database that would be compatible with conservation work. Through these two databases I study how the concerns of two communities of practice are at odds with one another, as well as why the second community (conservators) expended efforts to transform the first community's data into a more useful structure for conservation, beyond the field site.

The Corpus Christi Museum remains today the designated repository for the *La Belle* collection, which was excavated by the Texas Historical Commission (THC) over 1995-1997. This Museum was named by the 75th Texas Legislature (1997) as the state Marine Archaeology Repository, and conservation for the summer 1995 finds was carried out by staff of the museum's Ships of Discovery program. The Museum's relative proximity to the wreck site, early involvement in the project, and the size of facilities are factors which contributed to this designation. Museum staff continued the efforts of the THC archaeologists to record data and metadata about artifacts in a digital database (the first database I analyze here). The archaeologists in the 1995 survey project sought to pursue an all-digital, or "paperless" field recording effort using a FoxPro-brand Re:discovery database, a decision which stayed in place for the 1996-1997 excavation. As of July 1996, Texas A&M University's Conservation Research Laboratory (CRL) was contracted to perform conservation work on the *La Belle* ship hull and extensive artifact collection. The laboratory received artifacts from *La Belle* twice weekly over the August 1996 to April 1997 excavation, allocating many of the laboratory's large vats, chemicals, and electrolytic, radiographic, drafting, and carpentry equipment to conserving the *La Belle* ship hull and artifacts. Technical reports of the conservation work will appear in a

forthcoming scholarly monograph, with contributions from as many as 60 authors (Bruseth, Borgens, Jones, and Ray, 2017). The *La Belle* excavation site, located in a cofferdam,[16] had been mapped into one-meter squares by a Total Data Station (see footnote 11 in previous chapter), and grid coordinates were used to identify the provenience of objects. These squares were downloaded into the Re:discovery database, but the data there was found to be inconsistent in at least three ways.

Current evaluations from both communities with a continuing need to access excavation data – the excavators and the conservators – are unambiguously negative toward Re:discovery. The conservators' view holds that Re:discovery presented problems in supporting long-form treatment documentation, particularly for a set of objects called concretions. Concretions, which are an accumulation or clump of natural elements containing objects that do not show up during X-ray, were inconsistently numbered in the field and in many cases not numbered at all. The conservator community decided to use the artifact number as the root for further data recording and established a procedure to subdivide objects by material type. "Each class of artifacts got a sort of lot number, and then a specimen number, or multiples of numbers" (Malcolm, 7/23). Second, Re:discovery captured data in inconsistent and cumbersome ways: "bells were entered into the database thirteen different ways, and there were 1200 of them" (Marvin, 12/3). In the field, the manager of the Re:discovery database did not have a good strategy to standardize terminology, which is a data quality issue internal to the excavator community. I note that in any project, issues of data quality are most apparent and salient to the first outside user or reviewer of

[16] *La Belle* was the first excavation of a shipwreck in *dry* conditions using a cofferdam in North America. I note that archaeologists in Virginia built a cofferdam to carry out an underwater excavation of a ship from the Battle of Yorktown (Broadwater, 1992), and also that leading underwater archaeologist George Bass (1972), professor emeritus at Texas A&M University, has led cofferdam projects for smaller ships in Europe.

the database. Third, multiple errors existed in the excavators' Re:discovery database because each excavator was assigning artifact numbers in a different way (some numbers referred to a single object, other numbers to a concretion with multiple objects, and some numbers were not in the database at all but rather in paper records or Word and Excel documents). The project director of the excavation states, "Re:discovery was cumbersome for us. Archaeologists needed to be pigeonholed into it" (Mario, 4/8). The Collections Manager explained how conservators used the *La Belle* field database once it arrived at the conservation lab:

> [The conservators] started breaking down what's associated with that number, like object and material type. Once the field excavations were over and all the objects were moved, the conservators received the field database in an old version of Re:discovery, which they had no interest in using because it doesn't work for [recording conservation treatments]. So they exported it from FoxPro and imported it into Microsoft Access. So their conservation database had the original information in it by the end: the location, the find date, and the initial field identifications as to what the objects were. (Malcolm, 7/23)

Conservators did use the archaeologists' Re:discovery data, but had to first reformat them in order to be useful beyond the field. The problem is one of data format, and I will return to differences in format later since we will see that each community uses a different format. The reformatting via export was technically possible in this case. In one conservator's understanding of the excavation, the problems may have started because "data was not downloaded and loaded onto individual laptops systematically" (Marvin, 12/3). There was one main desktop and each of fifteen excavators received a laptop that synced to the desktop. This "syncing" is assuredly a task

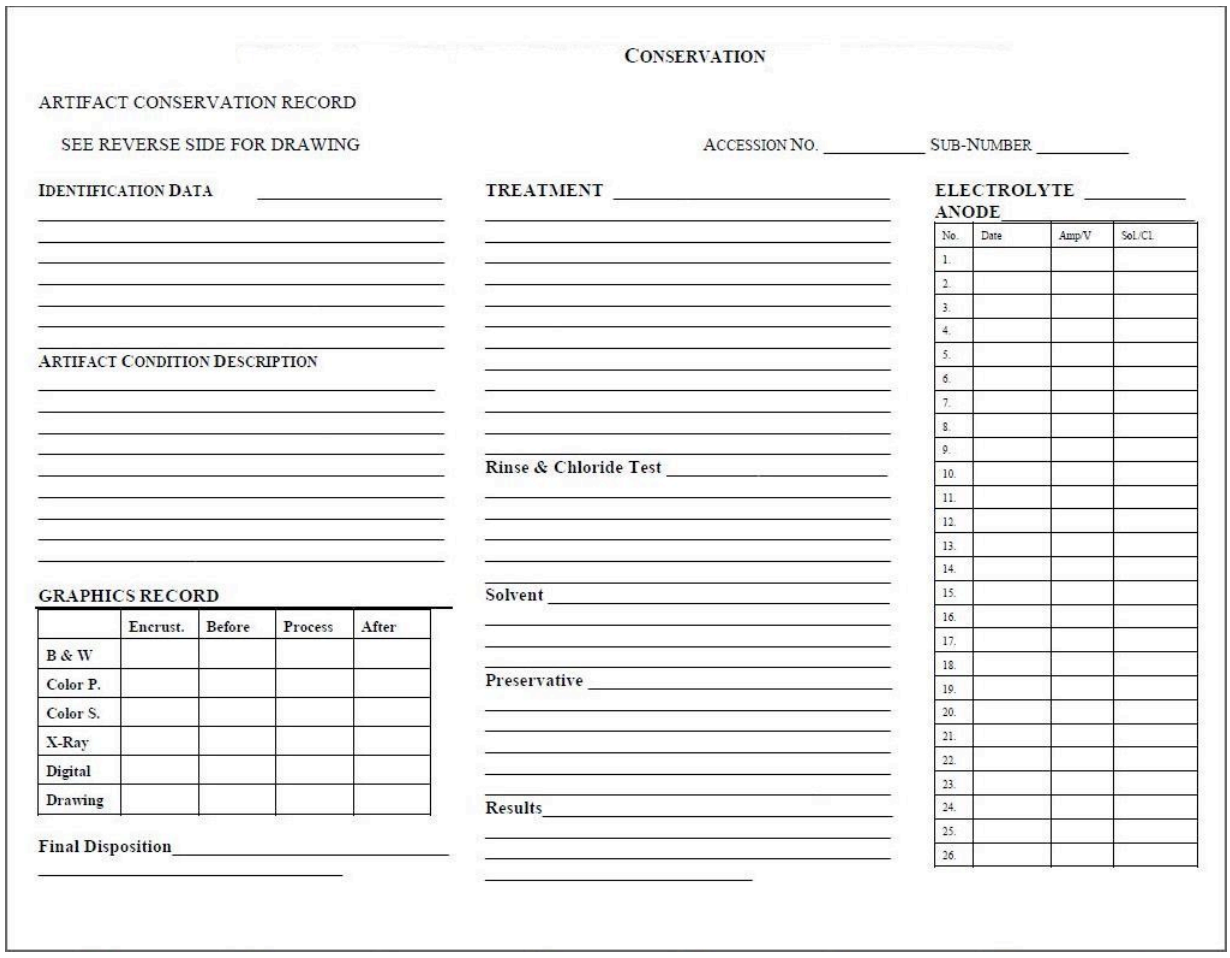
that requires dedication over the entirety of the excavation season, one that does not seem to have been carried out with the same level of meticulousness as we saw in the work of the Morgantina Data Supervisor.

The problems of the excavators' Re:discovery database were not fully addressed until the *La Belle* project transitioned from excavation to conservation activities (see Handoff Two later in this chapter). Until conservators implemented a procedure for counting each artifact individually, the artifact count according to Re:discovery was very low; this resulted in underestimating the timeline for conserving – and eventually exhibiting – the collection. Many of the problems I have discussed, especially for handling complex objects such as concretions or a string of beads, are "excavation" activities that only the conservators are equipped to carry out. Still, the capture of much of the field data in Re:discovery did not facilitate a smooth beginning.

In order to record the essential work of conservation treatments, the CRL exported data from the Re:discovery field database, merged that data into a second database based in Access, and wrote a set of guidelines for lab staff to use for the Access database. The guidelines distinguish between data supplied by two different communities: first the archaeologists (who assigned THC numbers on the site of the cofferdam) and second the conservators (who would supply a CRL number for artifacts missing a number). The conservators needed to interface with the archaeologists' data (and not vice versa) and in the process conservators discovered areas where data were incomplete. Even with a procedure in place for numbering objects with a THC number, in the time-constraints of excavation on the cofferdam the numbering procedure failed some objects. Some objects made their way from the excavation to the conservation lab without any visible number, a fact stated by both the project director and the conservators. Since the archaeologists had to prioritize completion of the dig over ensuring thorough numbering of every

single artifact, said numbering of every single artifact became a task passed on to the next partner on the *La Belle* project: the conservators. Also in the case of *La Belle*, some of the archaeologists were no longer available to perform this numbering once the excavation concluded. Before they could begin the advanced work of outlining conservation paths for materials, conservators dedicated attention first to bridging curation work across communities: reformatting excavation data and establishing an Access database to record conservation data.

In addition to exporting, importing, and re-categorizing the data turned over by the archaeologists, conservators also created several new datasets in multiple formats: conservation cards (see template in Figure 3), artifact photographs, and new numbers as artifacts were conserved and enumerated. As the conservators write, "Each artifact would have to be handled, cleaned, examined, conserved, drawn, photographed, documented and stored before, during and after conservation" (THC, 2015b).



CONSERVATION

ARTIFACT CONSERVATION RECORD

SEE REVERSE SIDE FOR DRAWING

ACCESSION NO. _____ SUB-NUMBER _____

IDENTIFICATION DATA _____

ARTIFACT CONDITION DESCRIPTION

GRAPHICS RECORD

	Encrust.	Before	Process	After
B & W				
Color P.				
Color S.				
X-Ray				
Digital				
Drawing				

Final Disposition_____

TREATMENT _____

Rinse & Chloride Test _____

Solvent _____

Preservative _____

Results_____

ELECTROLYTE _____

ANODE_____

No.	Date	Amp/V	Sol./Cl.
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
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21.			
22.			
23.			
24.			
25.			
26.			

Figure 3. Conservation Card format Used by Conservators.

The archaeological curation contributions made by CRL conservators include data about the treatments performed and identification of major object categories, sub-categories, condition and status of conservation, color, basic form, and card entry numbering information. CRL's usage is consistent with research (Henderson, 2011) showing how conservators use databases in order to record and document decisions made in treating artifacts. As each batch of material completed conservation treatment, conservators transferred the objects with their conservation cards from the conservation lab to the repository until all 1.6 million objects had arrived at the

repository by 2016 for further scholarly analysis (THC, 2015b: “Conservation Notes - CRL: Milestones” & “Artifact Transfer Form 2012”).

The conservators hand their Access database, conservation cards, and photographs over to the state repository collections manager, who then begins to make different enhancements that I will discuss below on top of the conservation data. The first excavation database Re:discovery is no longer part of the path that is forming, as it only exists in the form of record printouts in the repository collection. The conservators hand the conservation data to the repository, but do not hand data back to the archaeologists (the project director could request it from the conservators, but other archaeologists on the team are no longer on the project). When conservation records are not sent back to an archaeologist, the archaeologist is not able to use the information discovered in the conservation lab for their own research on the archaeological site. An archaeologist must proactively seek the conservation information. The linearity of this workflow reinforces an emerging notion of discontinuity between the communities of archaeologists, conservators, and repository managers.

Collections Managers

While this study observed elements of archaeological curation in practice at all four sites, it is at the repository that data curated in excavation and in conservation become accessible for outside scholars to research. Repositories assume responsibility for the long-term preservation of archaeological objects excavated within a given state or region in the United States. Archaeological repositories are regulated at the federal and state levels, and may also be aligned with a state university or state museum. One such Texas repository manages collections with the status of held-in-trust for state agencies. There, the Registrar liaises between an archaeological

CRM firm and the repository Head of Collections (a title within the community of practice I refer to by the more general name "collections manager"). The collections manager closely reads inventory forms that firms submit with their objects to the repository:

> *If you're not going to dig it up so that someone can use it later on, then why are we digging it up?* Why are we even doing this, if we're not going to do it correctly? (Phoebe, 10/6; my emphasis).

This quote suggests that the collections manager is concerned that there be enough information to allow the reuse of the material. We have seen conservators express this concern when they encounter data created by archaeologists as well. In this instance, we see the collections manager concerned with curating data for the long term. Yet, despite this concern (which is possibly shared), curation practices look different for each profession. Understanding what aspects of data another community values requires a perspectival shift that can become a source of miscommunication.

Collections managers, as Sullivan and Childs (2003) posited, possess a specialized set of skills that include the ability to speak about collections care needs with archaeological firms, develop policies regarding accessioning artifacts, and support archaeological research. The realization that archaeologists' data are not adequate enough in its original instantiation for a collections manager to immediately proceed with collections care prompts my articulation of a theme of "dueling databases." Specifically, a collections manager speculated on how much more smoothly her work could proceed if only archaeologists had invested more time and effort into completing documentation in a certain way:

> Think of the amount of time we would have saved at the end. People get very introspective and they can't see people having to do [different] jobs. They don't realize that if they did their job just 3% different, it would save me 97% of what I have to do. You taking five more minutes saves me 40 hours! (Phoebe, 10/6).

The most important data to a collections manager is different than the data that is most important to an archaeologist. In this case example, the collections manager described receiving a few boxes of "sorting bags" in a submitted collection with objects mixed together from many different provenience lots. These bags were at odds with both the rest of the collection and with the inventory provided in the accompanying documentation, and had to be disassembled and the objects placed into the appropriate box. This is a task that might have taken the archaeologist minutes to do, but was overlooked. We see that this handoff problem might be easily resolvable, but it would involve each community inspecting each part of the data (including every object box) prior to handoff to ensure the objects match the final documentation.

Each profession has certain expectations and protocols for data-recording, and collections managers and artifact conservators desire not to displace another's role in the archaeology field but rather to collaborate more productively. For example, the repository can do minor stabilization (recorded in a Condition Report and inputted with any digital pictures into the facility's remote database), but not full conservation, which the repository manager would arrange a conservator to carry out. A repository's data preferences with regard to objects are very different from other communities' preferences. We will now explore these preferences by examining two document forms containing the kind of data a collections manager works with in

the course of performing collections care for archaeological objects. We will see that the repository-collected data is structured in an entirely unique way, a professional norm that an archaeologist must be aware of when interacting with the collections manager, as at the point of accessioning excavation materials from the field into a repository.

Repository Accession as an Occasion for Restructuring Field Data

Collections care policy and procedure are best captured in the structure and content of two document forms: a Collections Processing Record, and a Collections Inventory Worksheet (Figures 4 and 5). The collections manager provides both forms to the submitting agency or archaeologist for the archaeologist to complete based on the archaeologist's knowledge of what happened to objects in the field, in the case of the processing record. But as we will see in the data structure of the inventory worksheet form, obtaining this information depends little on knowing the archaeologists' field experience. In fact, the collections manager can create these data from scratch using measurement tools in the controlled setting of the repository.

COLLECTION PROCESSING RECORD

(ONE PER PROJECT IF APPLICABLE)

Project/Company_____ Date of form_____

County (ies)_____

This completed form must be submitted with each project if a collection was made. It documents the processes and materials used in cleaning, labeling, preserving, conserving, and preparing specimens for curation. Please continue on reverse side and/or attach additional documentation if additional space is needed or if some specimens received special processing (identify and explain procedures used).

1. Are any uncleaned/untreated specimens reserved for future analysis? If so, how can they be recognized in the collection? Examples: dry brushed bone, organic residue samples, etc.

_____

_____

_____

2. If any specimens have been subjected to special treatment or analyses, how can they be recognized in the collection?

_____

_____

_____

3. What type(s) of ink was/were used in labeling, and what type of solvent and coating agent (i.e., PVA or B-72) was used to coat the surface and/or cover the label on the artifact?

_____

_____

4. Were preservatives applied to any specimens? If so, what type of preservative and solvent were used, and how can the specimens be recognized in the collection?

_____

_____

5. If there are metal objects in the collection, what conservation treatments have been applied, and what is the condition of the material at the time of submission?

_____

_____

_____

6. Have any objects had conservation treatment not noted elsewhere on this form? If so, specify.

_____

_____

_____

Cleaning Details

Material	Washing (Kind of Water)*			Acid Bath	Dry Brushing	Other Methods
	Water-Screen		Washing	Type of Acid & % Concentration		
	Field	Lab	Lab			
Bone						
Shell						
Lithic						
Ceramic						
Vegetal						

* U = Unprocessesd T = Tap DI = Deionized D = Distilled O = Other (specify)

TARL Curation Form 3 (Date 9/2004)

Figure 4. Repository Collection Processing Record.

Accn #_____

COLLECTIONS INVENTORY WORKSHEET

(ONE PER SITE IF APPLICABLE)

A worksheet must be completed only for sites with collections. Each phase of investigation — survey, testing, excavation — is considered to constitute a separate collection. Fill in blanks for categories marked with an asterisk. Page 2 — please indicate the number of specimens/samples in the blank provided for each category.

PROVENIENCE: TEXAS OUT OF STATE USA FOREIGN

TEXAS GEOGRAPHIC DIVISION: East Central Coastal South North Panhandle Trans-Pecos

* COUNTY_____ SITE TRINOMIAL_____

* OTHER NAMES_____

* PROJECT NO., NAME, & DATE_____

_____

* PERMITTING AGENCY & NO._____

* CULTURAL/TEMPORAL PLACEMENT: Paleo Archaic [Ea Mi Lt] Ea Ceramic Lt Preh Historic

Other_____

* COLLECTION METHOD: Random Finds_____ Surface_____ Subsurface_____

DOCUMENTATION: County_____ WPA____ Pre-WPA_____ Other_____

* FIELD INVENTORY: Yes____ No____ By_____ Date_____

Remarks:_____

LAB INVENTORY: Yes____ No____ By_____ Date_____

Remarks:_____

LOCATION: GC_____L/O_____

VC_____Other_____

HO_____

_____

Worksheet Filled Out By_____ Date_____

(TARL Collections Staff)

* _____ Date_____

(Submitting Agency/Company/Individual)

Comments:_____

_____

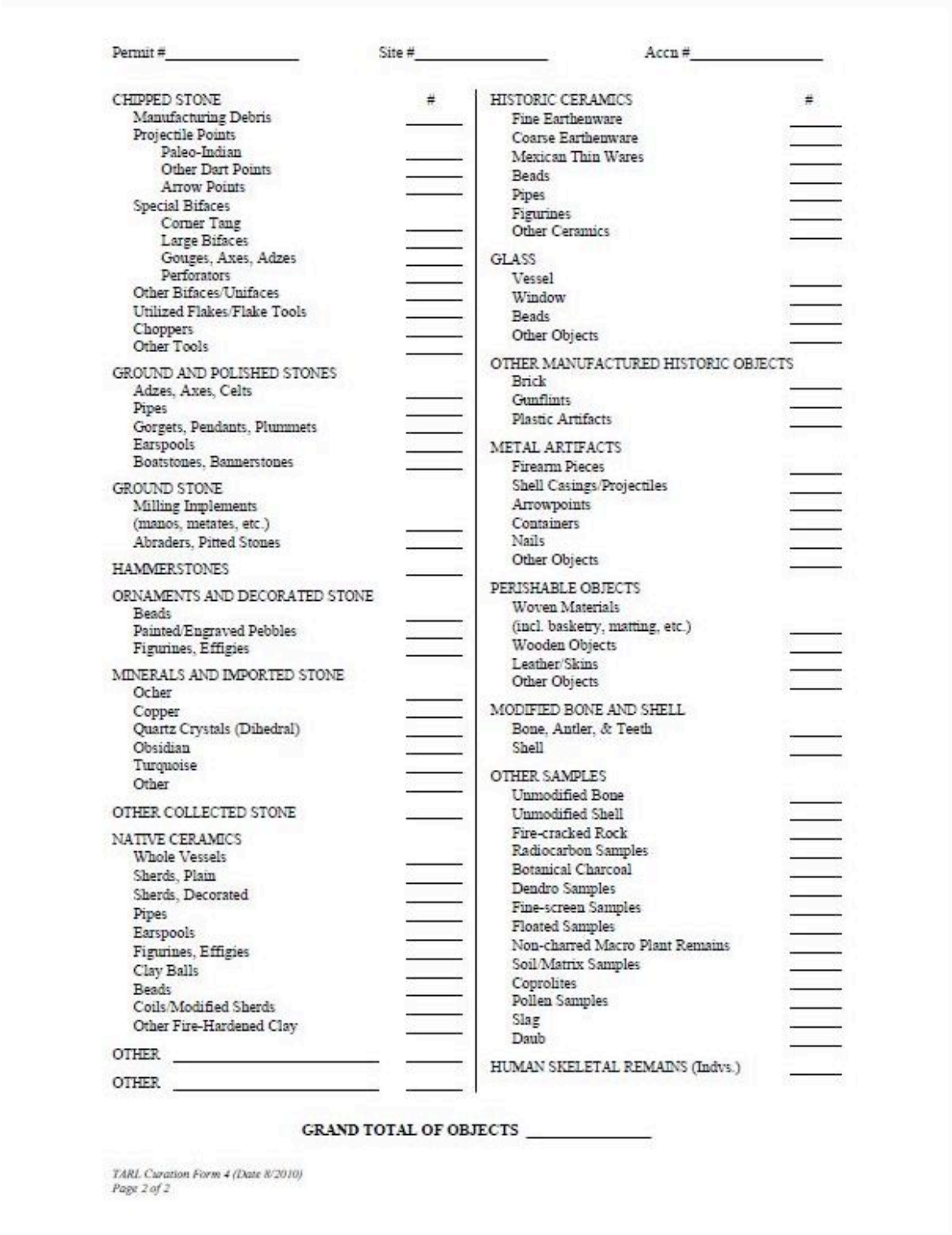
_____

_____

_____

TARL Curation Form 4 (Date 8/2010)
Page 1 of 2

Figure 5 continued next page.



Permit #_____ Site #_____ Accn #_____

CHIPPED STONE	#
Manufacturing Debris	
Projectile Points	
Paleo-Indian	
Other Dart Points	
Arrow Points	
Special Bifaces	
Corner Tang	
Large Bifaces	
Gouges, Axes, Adzes	
Perforators	
Other Bifaces/Unifaces	
Utilized Flakes/Flake Tools	
Choppers	
Other Tools	
GROUND AND POLISHED STONES	
Adzes, Axes, Celts	
Pipes	
Gorgets, Pendants, Plummets	
Earspools	
Boatstones, Bannerstones	
GROUND STONE	
Milling Implements (manos, metates, etc.)	
Abraders, Pitted Stones	
HAMMERSTONES	
ORNAMENTS AND DECORATED STONE	
Beads	
Painted/Engraved Pebbles	
Figurines, Effigies	
MINERALS AND IMPORTED STONE	
Ocher	
Copper	
Quartz Crystals (Dihedral)	
Obsidian	
Turquoise	
Other	
OTHER COLLECTED STONE	
NATIVE CERAMICS	
Whole Vessels	
Sherds, Plain	
Sherds, Decorated	
Pipes	
Earspools	
Figurines, Effigies	
Clay Balls	
Beads	
Coils/Modified Sherds	
Other Fire-Hardened Clay	
OTHER _____	
OTHER _____	

HISTORIC CERAMICS	#
Fine Earthenware	
Coarse Earthenware	
Mexican Thin Wares	
Beads	
Pipes	
Figurines	
Other Ceramics	
GLASS	
Vessel	
Window	
Beads	
Other Objects	
OTHER MANUFACTURED HISTORIC OBJECTS	
Brick	
Gunflints	
Plastic Artifacts	
METAL ARTIFACTS	
Firearm Pieces	
Shell Casings/Projectiles	
Arrowpoints	
Containers	
Nails	
Other Objects	
PERISHABLE OBJECTS	
Woven Materials (incl. basketry, matting, etc.)	
Wooden Objects	
Leather/Skins	
Other Objects	
MODIFIED BONE AND SHELL	
Bone, Antler, & Teeth	
Shell	
OTHER SAMPLES	
Unmodified Bone	
Unmodified Shell	
Fire-cracked Rock	
Radiocarbon Samples	
Botanical Charcoal	
Dendro Samples	
Fine-screen Samples	
Floated Samples	
Non-charred Macro Plant Remains	
Soil/Matrix Samples	
Coprolites	
Pollen Samples	
Slag	
Daub	
HUMAN SKELETAL REMAINS (Indvs.)	

GRAND TOTAL OF OBJECTS _____

TARL Curation Form 4 (Date 8/2010)
Page 2 of 2

Figure 5. Front and Back of a Repository Collections Inventory Worksheet.

Figures 4 and 5 in essence reveal the repository's priorities towards handling and managing archaeological collections. In these forms we see that the repository has two primary concerns; the first is to make space on their shelves on which to store artifacts. All of the data requested on these forms is aimed at assessing the size, weight, and physical needs for storing the artifacts long-term. The second concern, just as important as the first, is to learn of previous treatments that might affect the objects' stability, structural integrity, and legibility of any labels. Such concerns are particularly revelatory as they are quite different than the aims of each of the other communities we have seen thus far. That is, the archaeologists were more interested in issues related to the artifacts' provenience in the field, their provenance, and their context. The conservators were interested in the state of the objects, the treatments applied to return them to something closer to an original state, and the materials the objects are made of. Both concerns are different from the repository perspective, but the situation is cumulative – collections managers seek data on what objects are made of and how they were treated in the field mainly to figure out how to keep them stable (that is, preserve them) with minimal future interventions. The Collections Processing Record (one per project) requests location data in the form of the County where the work occurred, followed by a matrix for the archaeologist to describe the Cleaning Details performed on the material (whether Bone, Shell, Lithic, Ceramic, or Vegetal) through such techniques as washing, acid bath, dry brushing, or other means. These data are important to the collections manager because they tell what environmental conditions the artifact has been subjected to, and what chemicals have come into contact with the artifact during prior conservation treatments. For example, the use of arsenic in the late nineteenth and early twentieth centuries to combat pests is now a danger to people working with these collections.

The collections manager needs these treatment data to plan and prepare an appropriate environmental storage space to permanently house the artifacts.

Secondly, the Collections Inventory Worksheet (one per site) requests inventory-level data for each site, specifying that each phase of work at a site (e.g., the U.S. federally-recognized phases of survey, testing, excavation) be considered as separate collections. The specificity with regard to location data further indicates a within-state repository focus. The five given Cultural/Temporal Placements from which the archaeologist is asked to select reveals the collections manager's orientation to North American archaeology timescales, but particular date ranges are not specified: the five placements that are supplied on the form are arguably outdated and very generalized; definitions for "Archaic" alone have exploded in number in archaeological scholarship.[17] This interest on the part of the collections manager in understanding the "context of collection," albeit with these terms, extends as well to the data requested about the Collection Method (random finds, surface, or subsurface) and Documentation (County, WPA, Pre-WPA, or Other). The latter data are useful for the collections manager's efforts to place the collection of artifacts in context of regulations on the excavation: federal Works Progress Administration or County-regulated projects are two suggested possibilities. Finally the archaeologist is asked to mark whether a Field Inventory and/or a Lab Inventory were created, and by whom and when. This precedes a second page which provides a detailed listing of material classes and subclasses with a space for the archaeologist to quantify the number of objects being submitted for permanent collections care that fall within each class. A grand total of this number concludes the

[17] The problem of using conceptual rather than quantitative language when referring to periods of time has become an object of study. The PeriodO gazetteer is one effort aimed at compiling these competing definitions to enable more precise uses of these terms.

form, which constitutes a high-level overview of each phase of the archaeological work carried out at a particular site.

One who is not a collections manager might argue that the data these forms request can be somewhat useless, particularly to an archaeologist or a potential researcher: is a larger "grand total of objects" meaningful at all? One needs only to drop a bag for the total to go up, and for this reason, some collections managers use weight instead (data that helps prevent shelf collapse). Yet I recognize that these collections care data serve the purposes of quantifying the collection and providing a basis for the collections manager to make decisions regarding the environmental storage needs of the collection, including allocating space, fabricating microclimates, and placing like materials together (e.g., organics and metals in different humidity-regulated rooms than soil samples). By examining the structure of documentation we better understand the concerns of the collections managers and how they center on understanding the scope and size of a new incoming collection of artifacts, data known only to conservators and archaeologists responsible for submitting the collection from the field to the repository. However, we have seen here that the repository's main concern is to gather data about objects' space and environmental management – data which are unlikely to offer much help to scholars with archaeological or historical interests. Apart from this core focus, the repository also collects copies of site reports written as part of the project closure process, and makes these accessible in a library. The repository prioritizes researcher access to collections, but does not display the materials in an interpretative exhibit. Museum exhibit makers, the community I discuss next, select some objects from a repository collection and tell stories with those objects.

Exhibit Makers

With the material preceding this section, I have shown that curation is a distributed practice that occurs before and beyond the work of museum staff. All of the documentation generated and completed by archaeologists, conservators, and collections managers over the course of work are central to the aims of archaeological curation as a professional practice. Archaeological curation relies on each documentation component we have seen thus far, ideally all of which curators in a museum setting will gather, assess for possible selection, and use in writing exhibit labels and text. I now take the events of the *La Belle* excavation and exhibit installation as the basis for studying the museum's role in archaeological curation. Museum exhibit makers' work is only the culminating activity of at least three that have already occurred (excavation, conservation, and collections care), but is the one that brings archaeological results into public visibility. In this section I will continue analyzing the *La Belle* find, excavation, and conservation activities but will primarily contextualize the Bullock Texas State History Museum's role in the overall activity. In the final paragraphs I specify the curation documentation created during the museum exhibition reassembling the "jigsaw" of the conserved ship timbers.

Curation Made Public

The museum exhibit makers seek to use the *La Belle* artifacts to tell a story about the history of Texas. The Bullock Museum presented a special exhibition from 2014-2015 that centered on one large object, a ship hull, that visitors could watch the Head Conservator actively reassemble from individual conserved timbers of wood. An expanded presence for *La Belle* had been in museum curators' permanent plans as early as the museum's establishment in 2001. The *La Belle* project was first featured in a three-part exhibit, the largest exhibit on the first-floor,

from that year until conservation treatments for the *La Belle* were completed in 2014. That first exhibit included a pewter cup stamped with the name of a possible member of the ship crew (C. Barange), alongside other artifacts from the excavation that illustrated *La Belle* as a light frigate that served to move passengers and a "colony kit" of cargo for the French settlement. In Figure 6, I present three views of *La Belle*'s presence in the museum over time: first the pewter cup that was on display until 2014, second the hull during its reassembly over 2014-15, and third the reassembled hull in 2016. By showing these pictures in combination, I am emphasizing how the narrative the museum presents about these objects has grown in complexity as the archaeological curation work occurring in this project has itself made significant shifts in focus from excavation, to conservation, to collections care, and to museum storytelling.

Figure 6. Museum Views of *La Belle* in 2012, in 2014-2015, and in 2016.
Courtesy Bullock Museum, Texas Historical Commission, and author, respectively.

In 2014, following completion of the freeze-drying conservation process, plans began to be put into action to reassemble the *La Belle* ship in the central gallery space of the Bullock

Museum. The curators' plan for public reassembly aligned with the Bullock Museum's foundational commitment to exhibiting *La Belle* as a cornerstone of its exhibitions, and the Museum leadership saw in the *La Belle* project an opportunity to court new audiences and engage visitors by providing a very unusual opportunity to watch expert conservators at work. The concept of carrying out the reassembly in public view was an innovative idea pursued by the museum and project leadership, in order to spotlight archaeological curation work. All conserved pieces, now 600 in number, of *La Belle*'s keel (800 pounds), keelson (1100 pounds), forefoot, floor planks, buttresses, futtocks, and mast arrived from the Conservation Research Laboratory and were moved into the museum gallery space (Associated Press, 2014). Recalling the public attention given to the cofferdam excavation in Matagorda Bay from August 1996 to April 1997, the opening of the special exhibit "*La Belle*: The Ship That Changed History" on 25 October 2014 brought the 300-year-old vessel back to public attention. The most distinguishing part of this exhibit was the public performance of conservation work, assembling from timbers the object to be featured in a centerpiece exhibit. Rarely before had reassembly of a ship hull constituted an exhibit, and conservators carried out in front of curious museum visitors the work of solving a "600-piece jigsaw puzzle" (Page, 2014). Of particular note is the emphasis the museum placed on enabling visitors to interact with the conservators using various media, which expanded the audience even beyond these visitors. The entire rebuild was broadcast daily on a webcam posted to the Bullock Museum's website, and photos shared on social media. The project director and conservators kept daily sequence logs in order to keep the stages of the assembly on track and to share the overall strategy with visitors (Mario and Mason, 4/8). The conservators' presence truly brought this story to life, blending in new ways public archaeology, conservation, history, and museum curatorship. Visitors asked questions, grade-school field trips

heard gallery talks throughout the 2014-2015 academic year, and conservators made visible progress in reassembling the hull as it last was in 2001. The conservators created data for over a year about the reassembly progress, data that illustrate exhibition activities as a part of archaeological curation.

Museum exhibit makers and conservators contributed data about the particular curation process of reassembling timbers and selecting objects for the expanded exhibit that would feature the ship. The Bullock Museum and the Texas Historical Commission (THC) extensively promoted the ship reassembly and engaged new audiences using interactive social media.[18] Museum curators used the #labelleship hashtag to post real-time snapshots and videoclips, historical facts and trivia, trailers for the museum's 4D special effects film "Shipwrecked," and posts from social media staffers talking about the conservators' work. Just as the excavation nearly two decades earlier had invited the public to the archaeological field site, now visitors could witness and understand the strategic reassembly and decisive final curation of the hull timbers. The ship was moved one final time into its permanent home on 21 May 2015 in front of a large crowd (Clegg Industries, 2015). Over the summer the remaining timbers were moved to the gallery space behind the hull, awaiting their placement in the puzzle. The first floor gallery reopened on 8 August 2015, with *La Belle* in a permanent location for, as the conservators hope, the next 300 years.

As the conservators completed the reassembly at the museum, they mainly drew on existing data to join timbers but also refocused efforts on synthesizing the data that had been

[18] This social media campaign included frequent posts to Twitter, including a series of Artifact Spotlights from the Texas Historical Commission. For an example: "This new Artifact Spotlight from the @BullockMuseum is about #labelleship: http://bit.ly/1GtUMmB" Tweet, 22 May 2015. https://twitter.com/TxHistComm/status/601766332590379008

generated over the nearly two decades of conservation work. The presence of the excavation project director during the reassembly helped conservators make important decisions regarding the final placement of some of the timbers. The synthesis I explore further in Handoff Four entailed gathering and accessing a complete set of fieldnotes from all of the original excavators and conservators, an effort aided by the repository collections manager. The conservators' work in the permanent museum gallery space during the fall of 2015 focused on completing attachments of the small planks and trellis and preparing to remove the support blocks, bringing the ship hull 9 3/4" closer to the ground. The conservators reattached timbers to their original location and secured the hull so that once encased in a glass display it will not need to be touched for decades. Recalling what we saw in the conservation lab regarding the documentation of conservation treatments, the conservators working in the museum understand that the original material is transformed structurally by the conservation process including the reassembly work. The documentation created now will help ensure that conservators in future decades will be able to reverse these treatments if needed, a tenet of modern conservation practice. The museum exhibit makers and conservators for *La Belle* have generated immense documentation during the reassembly, including photographs of timbers as they are fitted to the fiberglass support, lists and logs of daily progress, and personal sets of notes from which the conservators will write a final report of the hull reassembly – all part of the work of data synthesis I explore further in Handoff Four.

In this first section of the chapter I have identified key actors who contribute to the practice of archaeological curation and analyzed curation activities they perform as part of their communities of practice. My RQ1 asks whether curation activities occur outside of museum

settings, and I found that they occurred on field sites, in conservation labs, and in collection repositories, as well as in museums which draw together all of this received information for purposes of planning an exhibition. I strived to articulate what each actor uniquely contributes to archaeological curation that had not previously been acknowledged. This investigation turned out to be more complex than I had anticipated: not only did I observe a larger number of actors than I expected, but I also noted intricate documentation practices that spilled over the institutional setting in which each was situated. Documentation varies across these communities of practice. Next, I focus on the larger-scale interactions happening when one community interacts with another. I maintain that these interactions are problematic because of physical distance, technological differences (for recording and storing data), and asynchronous stages of activity (some data creators are no longer available to supply missing information). In the exploration of my RQ2 and RQ3 that I present below, I will now expose the complex associations I have seen as these actors interact with each other, which I term "handoffs." The presence of complex data handoffs between two communities is problematic for the reasons I explore in the third section, and I maintain that the practice overall is not one of a curation continuum but rather a "discontinuum."

A Discontinuum of Curation Practice (RQ2)

Four communities of practice are involved in the object path from excavation to museum. Each one, as we shall see, uses specific data formats to document objects – creating new data that may borrow from parts of another's system. Because these data are specific to one set of professional activities, problems arise at handoffs due to a lack of one consistent documentation

system useful to all communities. The handoffs of data between two communities that I analyze in the third section of this chapter collectively form a discontinuum of practice. Having described the four communities of practice and how each curates objects in the above section, I will next explain why the differences seen in these practices are problematic as a whole. In Figure 7 below I summarize the four communities I have just discussed and the activities each is responsible for. First, I note that an object can follow one of many possible paths from excavation to the place providing permanent retention: for example the object could traverse only two communities (from excavation straight to the museum), or three (excavation to conservation to repository) or all four. The object is also trailing with it a large bundle of documentation, which may follow that same path or another path entirely (and each community that encounters that documentation could do one of three activities: use, reformat, or discard those data). There are many possible paths by which data are handed off from one community to another community, and the lack of continuity creates a curation discontinuum. My discontinuum finding starkly contrasts and confutes the coherence of the model that I devised earlier in Figure 1 to capture a view of curation according to some of the literature. Next and more significantly, apart from finding that multiple paths exist, I emphasize that the points of transition between professional groups are very problematic for both the object and the documentation. In presenting this core finding, I will next analyze four such transitions which I term handoffs. The four handoffs of data that I will discuss in the next section are depicted in Figure 7 below as a one-way arrow between two communities.

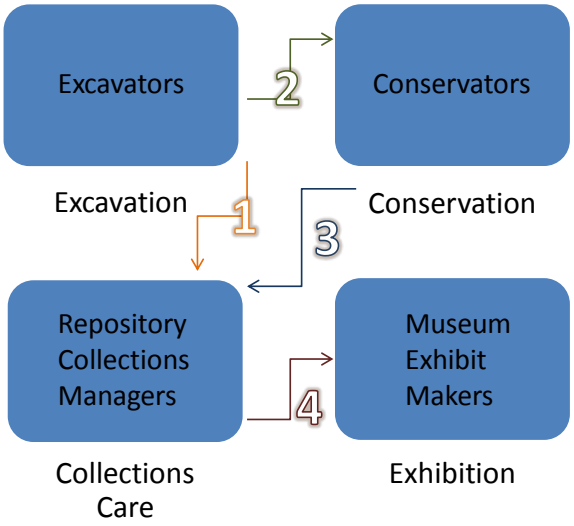


Figure 7. A Curation Discontinuum with Data Handoffs

In Figure 7, I illustrate four pairs of communities in archaeological curation that are involved in data handoffs. Part of what makes such handoffs problematic is their linear (as represented by jagged arrows), rather than circular nature: one community transfers data to another, and the first community is not made aware of new changes or additions made at later stages of a project. For example, both Handoff 1 and Handoff 2 involve excavators handing over data, but I did not observe practices where excavators are tasked with enhancing other communities' data. It is important to emphasize that other handoffs and relationships between communities of practice, beyond those I capture here, are possible. One such possibility could be a case when a collections manager identifies an object that needs conservation treatment, transfers that object to a conservator, the conservator transfers the object back, and the collections manager either concludes the activity or discovers other materials in the same

collection that also need to be conserved. In such a case, a more circular connecting line could be added to the figure to represent this and other continuing interactions.

Museum exhibit makers draw on the databases and records created by excavators and conservators created at earlier stages of archaeological projects, often years or decades before an exhibit is planned. Museum curation work would be incomplete without these earlier contributions. For this reason, I referenced the continuum concept from archival studies to express how each community's work builds cumulatively. The records continuum model as introduced by Australian archivists (Upward, 1996, 1997; Reed, 2009; Lin, 2007) emphasizes the continuing value of records. The model has since been extended to information systems (Upward, 2000), data curation (Treloar, Groenewegen, and Harboe-Reedoi, 2007), and culture (Gibbons, 2015), and I argue here for a variation of the continuum model to encapsulate the status of archaeological curation. After collecting my data, I determined that the multiple curation contributions form not a continuum but rather a "discontinuum." The analysis of my heterogeneous data and the salient aspects I observed at my research sites indicated that these communities coexist but do not actively coordinate their efforts. My discontinuum model captures the lack of a clear path between the different component activities of archaeological curation.

To illustrate this discontinuum by way of analogy, we can consider the archival concept of a holding record. An archival holding record (or control folder, whether digital or paper format) embraces the full history of the item it describes, and an archivist can create metadata for this record for purposes of describing the biographical or life history of an archival collection: its offer by a donor, appraisal process, description, conservation, arrangement, and mechanisms to provide access, e.g., through a digital archive. Just as the holding record captures what is known

of an archival collection's provenance, my discontinuum concept captures many possible paths for an archaeological object through multiple activities (while acknowledging significant differences in data across these activities). Additionally Figure 7 emphasizes the importance of excavation as the broad starting place for archaeological curation work – the quality of the data generated by field archaeologists impacts the research potential and exhibit readiness of the objects much later. After excavation, the subsequent data generated from conservation, collections care, and exhibition may be shaped by data created earlier but the size of the total dataset generated for that object by the end of this discontinuum only continues to expand; the object biography grows longer. In other words, the museum staff could potentially access object data generated from *three* prior data contributors. The archaeologists, whose scholarly involvement with the material does not end with the excavation (in both the academic and CRM contexts), would also benefit from the same additional data that the museum staff have access to – plus data from the work of museum staff (i.e., data accessioned as museum archives). The archaeologists' work once done is forever unrepeatable and it is impossible for anyone to completely reconstruct an excavated site. Thus it becomes more incumbent upon archaeologists, as the initial contributor, to ensure that field data are as complete and detailed as possible. I frame this observation in terms of constraint and opportunity. The creation and curation of the field data creates a set of constraints on later datasets, while those later datasets create new opportunities that were not available to the earlier data creators. Such opportunities are impeded, however, by the presence of a discontinuum that has particular problematic handoffs of data between the communities involved in archaeological curation, and that lacks a mechanism for reviewing the expanded dataset with each community involved.

HANDOFFS AND INCONSISTENCIES IN DOCUMENTATION PRACTICE (RQ3)

This study identified several transition points during archaeological curation, when data or artifacts move from one community of practice to another. The key transition points are, in fact, found at four specific handoffs – core findings of my study. My third research question explores the impact of objects transitioning between communities on the documentation recording these activities: "Does the form and use of objects' accompanying documentation change at transition points, and if so how and why?" This section of Chapter 5 analyzes four handoffs: (1) the physical transfer of objects from fieldwork to repository in the CRM context, (2) the conservators' controlled excavation of multiple delicate objects and resulting list, (3) the collections manager's transformative integration of two prior single-purpose databases (the archaeologists' and the conservators'), and (4) the museum curators' synthesis of three sources of data when selecting and interpreting artifacts for a museum exhibit narrative. These handoffs are fundamental to the discontinuum I presented in the previous section, regarding how and where archaeological curation segments into distinct community practices. The four handoffs are problematic not only in the directions I describe, but also, and perhaps most significantly, because there are few efforts to facilitate the backflow of information from the museum to the archaeologists.

Handoff 1: Physical Object Transfer from Fieldwork to Repository

Cultural resources management (CRM) projects, unlike research excavations, are guided by requirements intended to ensure a smooth transfer of useful data from one community of practice to another. But these requirements are only sufficient for meeting the needs of the repository community – not the CRM community itself. On top of meeting the repository's data

preferences, we will see in this section how some CRM archaeologists also keep a copy of data for their own future use. The extra "data cleaning" that the archaeologists perform to meet repository requirements ultimately reinforces distinct community standards for archaeological curation.

CRM archaeologists record data in particular ways and the purpose of a field lab is to ultimately prepare artifacts for permanent submission to a certified repository. CRM archaeological projects are completed according to mandated standards. These standards shape the archaeologists' work practice in ways that are quite different from research excavations, revealing distinct kinds of authority in the two kinds of archaeological work. Two entities – the contracting agency or company and the State Historic Preservation Office (SHPO) – wield decision-making authority over the work of the CRM firm (that the museum, at least in the academic research excavation context I studied, did not). The procedure may have multiple steps but generally in contract excavation work, an entity that wants to impact public land (e.g. by building or construction) hires a CRM firm to first survey, and then excavate the land (if possibly impacted sites are found). The CRM firm then submits reports to the SHPO for Section 106 evaluation (of the 1966 National Historic Preservation Act), and the SHPO determines whether to permit the building project. The contracting builder and the SHPO both exercise selectivity in working with CRM firms, and over the course of multiple archaeological projects a firm will acquire a kind of track record that affects securing future contracts. The report that contract archaeologists must write and submit documents the course of activities carried out onsite and the results of their finds and analysis. Receipt of these reports at a state or regional repository is a crucial step that completes the permit allocated for that project, and ensures that the firm can obtain permits in the future as well as project payment. These reports constitute a large swatch of

the field's "grey literature," and the uses to which these are put vary widely, from extensive to rare use (Evans, 2015).

Project Director Nathan discussed the recordkeeping processes in place at one of these archaeological projects. Information about the time scope of this project is useful to consider. Having completed two months of excavation, his firm and the contract organizer were at a point of deciding whether to excavate for several more months or just one more month. In this case only the fieldwork portion of the project is budgeted for; once that is completed, the firm makes an assessment of their results, and prepares a budget for the analysis and writing portions. Following a successful negotiation, as this is a large excavation, the analysis might proceed for about a year, with a report produced at the end. Adherence to the federal requirements by a CRM firm ensures that the archaeological data gathered on the project will be useful later for research purposes, and some firms are more engaged in doing such scholarly research than others. The firm I interacted with is engaged in long-term research efforts. The current project crew comprises 15 people overall, including people assigned to work in the field lab.

One activity specific to cultural resource management (CRM) work – how Crew Chiefs transfer artifacts from an excavation unit to a field lab – will add to our understanding of trouble at handoffs across communities of practice. First, Crew Chiefs supervise excavators who bag artifacts and must record key pieces of data on each bag: site number, excavation unit number, the level number, the data, and the excavator's initials. However, the project director states that unexpected events can occur in the field:

> [There are] rainstorms, dirty sand and grit, so you want all of those paper records turned in as soon as they're completed, essentially, so they don't get damaged or lost. Same thing with the collections. (Nathan, 7/22).

Because of suboptimal conditions for recording data, Crew Chiefs do not always receive complete documentation as every unit is completed. When an excavation unit is completed, the Crew Chief brings in the artifacts and documentation to the field lab (a roughly per-unit review is intended to avert buildup and compounding of errors that might otherwise be discovered much later). The Crew Chief is also responsible for assigning a lot number to each level (this lot number will be applied to all artifact bags from that level). The field lab staff apply this lot number to the bags. The lab staff may ask the excavators to supply missing information at one of the only opportunities to do so: while the original excavators are available to clarify the source of confusion: "If you don't catch [errors] right away, it's going to get impossible to try to sort them out later on" (Nathan, 7/22). This is a crucial "catch" that impacts the usefulness later of the excavation data.

The purpose of the lot number is to be able to identify artifacts' provenience, from each level. The structure of this process introduces an opportunity for errors in the data to be noticed by field lab staff at the time of bringing the artifacts and documentation out of the field and into the lab, which the field lab staff will attempt to correct. Whether or not these attempts are completely successful may not be known until another community uses the same data, and I will explore this further.

The project director and the lab supervisor compile all of the records from the project, copy records that need to be copied, make digital copies of the photographs, and transform all

data into the format ultimately required by the repository. The CRM archaeologists keep a copy of the excavation data that is submitted to the next community of practice because the CRM firm will in the near future use the excavation data to support next steps in firm-specific research interests, a different use than that of the repository. The compiled documentation will also include a catalog, which is a record of all of the lot numbers generated for the site. The catalog enumerates general information such as the artifact class counts per lot. Some repositories request only this field catalog, while other repositories request documentation that the firm may have had outside material analysts create (a collaborator I do not fully discuss here). As Nathan stated, each repository has slightly different expectations for how the artifacts and their documentation should be submitted for permanent collections care, expectations which are driven by the repository's administrative structure and space constraints:

> There's a fair amount of variability in how the curation facilities want the artifacts sorted. ... You just have to know the standards of the curation facility you are using.
>
> *[for artifacts:]* The artifacts will be in boxes; the curation facilities also have standard box sizes that they require, and those vary. Some use a one-cubic-foot box that's roughly square, others have what they call 'trays' that they prefer their collections stored in that way.
>
> *[for documentation:]* The lab supervisor will bring the documentation usually in binders to be stored on shelves at the curation facility. The digital files will be taken over either on DVD, or if it's really big, on an external hard drive. (Nathan, 7/22).

The first sentence above is telling: it demonstrates that one community (excavators) must be cognizant of the standards of another community (repository managers), even when the first community's entire work process is not structured according to a shared set of parameters or expectations. The project director is responsible for being familiar with different repositories' published curation standards, and for communicating these standards to the excavation team members. (Though the repository is the destination, artifacts at risk for disintegration – not applicable in this particular CRM project – may first be sent for conservation and I discuss conservation next). This particular archaeological firm, which does re-engage with submitted collections for research purposes, has not encountered a repository rearranging the firm's collection from an excavation. While I will delve further into the nature of repository work in a later section, I suggest here that the repository community is primarily concerned with preserving the scheme with which an archaeological firm prepares excavation archives, and prefers (for several reasons) not to redo firms' diverse organizing schemes to fit a single "archaeological curation" model for organizing collections. In fact, this is the *respect des fonds* archival principle in action, but with some minor adjustments: *respect des fonds* as arranged by the firm as the firm thinks the repository wants. This appearance of *respect des fonds* at the archaeological repository is also in the broader sense of fonds as project (not including respect for original order as captured in the field, which the CRM firm preparator disrupts).

Once the fieldwork is completed, the firm turns to the analysis and writing activities of their project, leaving the site itself. The CRM project I studied here, at two months into a typically three-month fieldwork span, operates under protocols and time constraints due to pending construction work onsite that will occur at the conclusion of fieldwork, if the fieldwork is approved. After fieldwork, the project director selects and begins communication with a

repository in anticipation of preparing the collection for transfer. As we will see in the next section, short-term CRM excavators approach objects in ways that are similar to those of excavators working on long-term projects. The handoff between archaeologists and conservators, which I discuss below, is not regulated in the same way that documentation for a repository is regulated. In the absence of agreed-upon documentation protocols, we will see how conservators export and expand archaeologists' data in the course of conserving a large object collection.

Handoff 2: From Field Bagging and Tagging to Conservators' Controlled Excavation

Analysis of the conservation process of the *La Belle* collection highlights multiple issues around maintaining provenance. In this section I draw attention to a handoff which most concerns the conservators' work, especially when conservators act as excavators for more fragile objects. The field site environment, with its unpredictable weather conditions (wind and dust), makes complex the excavators' best efforts to secure accurate provenance data for each artifact as we saw with the cumbersome Re:discovery database. The excavator environment is wholly different from the one in which conservators and archivists work. The 1995-1997 excavators of *La Belle* recovered what would come to be enumerated as over 1.6 million artifacts from about 1500 artifact lots, all of which had to be kept wet prior to their conservation (Meide, 1997). As sediments were removed in 10 cm increments (levels), the provenience of all artifacts was recorded at the level of 50 cm quadrangles within one-meter unit squares according to a grid coordinate, documented in both a FoxPro database Re:discovery, then bagged, and tagged. Archaeologists completed unit summary forms, drawing forms, and timber recording forms. Following the conclusion of the excavation, these field records were accessioned by the Corpus

Christi Museum repository, and shared as needed with the conservators who began to treat these artifacts.

When the project director decided to disassemble the ship timber by timber, excavators made detailed drawings, plank tracings, and photographs so that the ship could be reconstructed during conservation. Just under 400 timbers (about 40 percent of the hull of *La Belle*) were removed over two months and drawn at the project headquarters, before these timbers and all of the excavated artifacts were sent to the conservation laboratory. The excavators handed these data first in 1995 to the Corpus Christi Museum, the designated repository for the collection. Once the Conservation Research Laboratory assumed full conservation responsibility in 1996, the objects were transferred again from the Museum to the Laboratory. Objects thus followed a path from excavation to Museum repository to conservation, while the documentation traveled only from excavation to Museum repository. The presence of both of these transfers ensured a separate path for objects and the documentation.

Conservators created separate conservation-specific documentation that built on the work of the archaeologists and defined the precise size and composition of the excavated artifact collection. Conservation documentation includes the Access database – which expanded over the course of two decades of work and was regularly sent as a record of work to the repository staff – and the conservation cards I introduced in Figure 3. With this conservation-specific documentation, the creation of the Access conservation database was the first point at which the project allowed access to the objects and database to scholars, who published research analyses about the hull and the artifacts (e.g., Carrell, 2003; Grieco, 2003; Reese, 2007; West, 2005). For any one object, we see that the recording of archaeological data about the *La Belle* collection was a task distributed among the excavators, conservators, the scholars, and later the repository

collections manager, the latter of whom compiled and centralized the earlier data as artifacts completed conservation and were accessioned into the repository.

Conservators at the conservation laboratory picked up from where preliminary artifact processing had concluded at the project headquarters (located in Palacios fifteen miles away from the cofferdam). The conservators worked to treat and document the treatments they carried out for an extraordinarily diverse range of artifacts, from wood and bone to glass and brass. In addition to the conservation treatments the team applied, they carefully documented all of their interventions by using the strategy of developing a set of codes to record the quantities of different artifact materials. Conservators identified particular problems with the Re:discovery database that, as I emphasize here, resulted in the creation of a new database in Access to meet the new purposes of the conservators. Conservators first pinpointed what problems with the first database existed and then addressed those problems by creating an Access database sufficiently flexible and expandable to capture new data to supersede the archaeologists' Re:discovery database printouts. In analyzing this action, I maintain that the databases created by the two different communities of practice of excavators and conservators were in this case complementary, if cumbersome to work with. Conservators picked up the Re:discovery database and expanded the archaeologists' provenience data by adding new data about quantities of materials. We will next see how the repository manager makes further enhancements to the conservators' Access database. Both the conservators and repository managers build on the data that has been created by one or two communities, some years prior.

Handoff 3: Lack of "Seamless Flow" Toward Collections Care

The friction between archaeology and museology with reference to descriptive data became very apparent in my study of the database managed at the repository. The presence of multiple databases created over the course of an archaeological project may be a problem unique to field archaeology, but it recalls similar issues that researchers in digital preservation have critically studied. The Seamless Flow program, initiated by the U.K. National Archives from 2003-2008, was a strategy that would facilitate the smooth transfer of electronic government records from their point of creation through their acquisition by the National Archives' digital archive. Another nearly simultaneous research initiative based in Australia, the Clever Recordkeeping Metadata Project, explored methods for integrating metadata creation into regular business procedures. Both of these ideas can serve as counterpoints (albeit perhaps idealized) to the situation at an archaeological repository, and indicate that the problem of data multiplicity is recognized in the somewhat related discipline of archival studies. The repository is responsible for providing permanent collections care for the artifacts and for collecting the documentation associated with those artifacts, including archival records from the excavation and records from the conservation work. In arriving at the *La Belle* project in 2009, the collections manager independently asserted that the same database could not meet the needs of everyone involved in the project, despite some participants' efforts to make it work for their specific needs:

> I noticed that the field database became the conservation database, which acted as the *de facto* analytic database, which sort of became the curation [collections care] database. The problem was in this project, people were mainly concerned with conserving the artifacts. They weren't thinking about curation, or coordinating all those steps in a way that was meaningful. (Malcolm, 7/23)

Here we see explicit recognition of four "dueling" community needs, and that there arose a lack of coordination at the beginning of the project on a database structure that could accommodate different types of scholarly queries of the data. Data created by different communities were not synced prior to the beginning of a new phase of work, until the Collections Manager began an attempt at integration (for "analytic" research) in 2009. I have also now introduced how three communities of practice are involved in the *La Belle* project: excavators (THC), conservators (CRL), and repository managers (Corpus Christi Museum). Figure 8 below summarizes what data flows between these three communities. It shows how each of three communities (archaeologists, repository managers, and conservators) interacts with one another in particular ways and engages in activities that stretch across two or more communities of practice. Taken together, the combination of activities constitutes a view of archaeological curation as an amalgamation of contributions from multiple existing communities of practice.

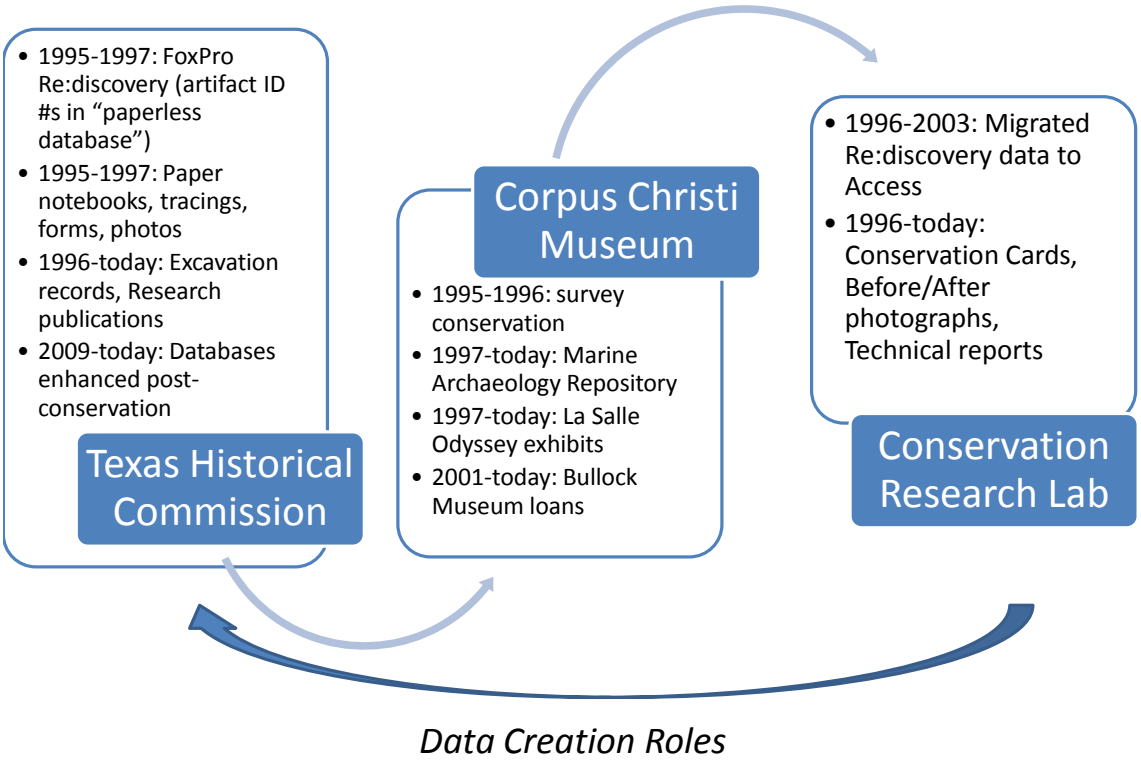


Figure 8. Data Flows in Conserving *La Belle*.

In Figure 8, the THC staff are depicted in two roles: first as the excavation director, and then as the repository manager (on behalf of the Corpus Christi Museum). (The bottom arrow from the CRL to the THC should be understood as arriving at the THC Collections Manager, not the THC excavators who have since dispersed). The Corpus Christi Museum, which became involved in the *La Belle* project one year before the CRL, is depicted second and most directly after the excavation because the Museum staff did receive artifacts from the excavation though did not create an interim database. After the excavation concluded, artifacts were transferred from the Museum to the CRL for full conservation beginning in 1996. The second database created was that of the conservators (in Access), who exported data from the first database

created on the excavation in Re:discovery. As conservators completed conservation of the collection, conservators transferred copies of the Access database as well as the conservation documentation, to the THC Collections Manager who reviews the materials on behalf of the Corpus Christi Museum staff. Only after this review, does the THC Collections Manager place the objects and documentation with the Corpus Christi Museum permanently. The Corpus Christi Museum loans objects for the Bullock Museum exhibits, and staff at the Bullock Museum administer the design of those exhibits. The Collections Manager receives databases created from at least two prior communities: excavators and conservators:

> There are a lot of moving parts; the problem is the data has never been good enough. (Malcolm, 7/23).

The collections manager at the repository works to integrate data collected from at least four project participants. Four communities of practice – field archaeology (Re:discovery), conservation (Access), collections care (also Access), and museology (PastPerfect)[19] – treated the *La Belle* data in different ways, creating four different databases. I see all the databases as artifacts of the communities of practice that created them, and I place them at the center of the issue of handoffs because I think they encapsulate the priorities and expectations given to a particular professional role. No one of these communities' databases contains the ultimate truth of the matter; rather I argue that each database expresses what is most important to that community, within the context of the project.

[19] PastPerfect Museum Software is a software program for collections and contact management developed and sponsored by the American Association for State and Local History (AASLH). I briefly introduce this database at the Bullock Museum in the context of Handoff Four in the next section.

My goal in this section has been to draw attention to the significant gap in collection-level understanding of archaeological objects that arises after the archaeologists and conservators complete work on the collection. Without the work performed by a collections manager, a museum exhibit curator would have a very difficult time using the original fieldwork data to help construct an exhibit, and might in the end choose not to use this data at all, as it is so complex and non-standardized. The collections manager helps bridge the handoff in data quality that occurs after archaeological fieldwork has concluded and the objects are transferred – in the best-case scenario – to a certified repository. Upon arrival from the field, the objects are not easily interpretable, and a collections manager works to supply missing information based on his understanding of the fieldwork process.

As I show below in Figure 9, the four places of curation activities for the *La Belle* project are physically separated from one another in a more complex and distanced way than we see at Morgantina (Figure 10). With so many handoffs built into the *La Belle* conservation process, it is not always possible for a single conscientious person to actively oversee each of these handoffs, considering one Data Supervisor had not been leading the *La Belle* project since inception. The upper half of Figure 9 maps the location of the seven coastal museums that make up the La Salle Odyssey, each of which specializes in storytelling part of *La Belle*. In the lower half of Figure 9, I have circled the four locations I am analyzing together: the excavation site, the conservation lab, the repository site, and the main museum.

Figure 9. La Salle Odyssey of Museums and *La Belle* Project Institutions.

Courtesy Texas Historical Commission and Google.com

In Figure 10, which illustrates the location and distance between the Morgantina field and museum, we can see that the relative proximity of these two places supports a relatively uncomplicated path that the objects will travel from excavation to the subsequent museum processing activities.

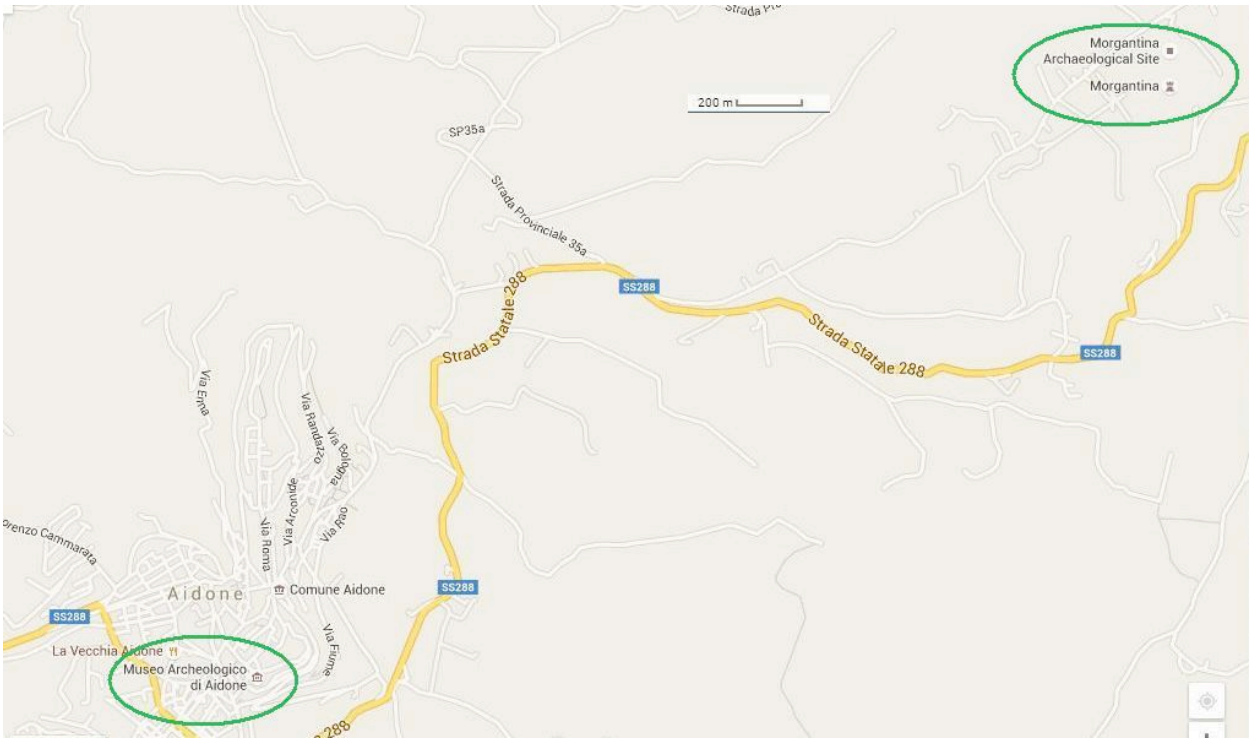


Figure 10. Map of Travel from Morgantina Field to Museum.
Courtesy Google.com.

As three *La Belle* communities of practice carried out specific tasks post-excavation, each hand-tweaked the data because members did not trust or find entirely acceptable another community's data. While this tweaking may meet the community's immediate need, the result is a growing collection of multiple additions that no community except the repository is

particularly interested in ameliorating. Data integration remains an ongoing challenge specific to the collections manager:

> I think it's hard to take the analytic data and put it into museum-specific databases. We talked about doing that with [*La Belle*] but there's so much work cleaning up the data we've just never gotten to that point. (Malcolm, 7/23)

My crucial finding here is that each community prefers to describe objects and prepare data about them in a different way (repositories and museums prefer a unique identifier for each object, conservators' database emphasizes treatments by batch of material, and the archaeologists' database captured provenience). Conservators did not create records for artifacts that lacked provenience information (for these, conservators only assigned preliminary identification numbers), but yet these artifacts still remained part of the collection and posed a massive problem once they arrived at the repository unaccounted for. The Collections Manager then had to account for these provenience-less objects (the collection grew from a field estimate of 150,000 artifacts to 1.6 million after conservation). The Collections Manager began to enhance the conservators' data at this point, by adding references to particular separate datasets: scholarship in the book chapters written for the 2017 monograph, conservation cards, and before/after photographs completed for all conserved objects. These resources were unavailable at the time of the field excavation, but available by the time the objects crossed the desk of the Collections Manager and as such his task to integrate. Yet when a researcher accesses the collection at the repository now, the levels of record detail about the objects are ultimately still

uneven, an effect of the volume of material and the distribution of the documentation work among excavators and conservators.

In the case of *La Belle*, the Collections Manager did not assume the role of assigning artifact provenience numbers to provenience-less objects until many years after the excavation was complete, which has resulted in significant work to improve upon the legacy information. One of the responsibilities of collections managers is to communicate the importance of archaeological curation to archaeologists seeking permits for excavation projects and later, clearance letters for completed projects. Though each excavation team manages data in unique ways and produces different levels of detail about the excavated objects (usually captured in some form of database), some of the certified repositories enforce specific requirements for the presentation of this data as a prerequisite to accessioning the collection permanently. We have already seen this from the CRM perspective, in Handoff 1. Repository managers are in active communication with archaeologists and firms regarding collections care, and new efforts from members of the repository community aim to stem the "curation crisis." Agencies responsible for regulating archaeology within some states require a data curation plan in order for the archaeologist to clear the permit (and to be approved for future projects). A flexible plan would acknowledge data created using some combination of paper and digital technologies to facilitate all of the micro-activities that are part of excavation work. I continue this analysis of the mechanisms used for capturing data in the final handoff I found below, which examines how museum exhibit makers access data created at earlier stages of archaeological projects and begin to publicly present and tell stories about objects.

Handoff 4: Synthesis at the Museum for the *La Belle* Exhibit

The museum community of practice seeks to tell a compelling story with the *La Belle* collection, and here I discuss this perspective aware of the larger institutional and political frameworks in which museum work proceeds. Because it is a historical museum, the Bullock Museum as part of its mission engages with research and is answerable to scholars. Museums introduce claims and interpretations that have particular kinds of support, such as from the funders and sponsors of particular exhibits. In constructing the exhibit, museum curators make discoveries beyond the original archaeological site reports, and supplement the data they may receive from those archaeologists. The new museum data may be captured, if at all, in staff meeting minutes and notes. However the lack of a systematic program to capture these important decisions results in a gap in documentation that reinforces the notion of a discontinuum, rather than a curation continuum. Without one or more museum archivists actively making sure these exhibit decisions are captured, the creation of the exhibit will be an opaque process not contained or accessible in the archaeological archive. In the case of *La Belle*, a collection of artifacts held in trust for the people of Texas, the story told at the Bullock Museum positions the ship in the context of early historical interactions between the French and Native Americans. To construct the exhibit, curators at the Bullock accessed the archive managed by the Corpus Christi Museum in conjunction with the Texas Historical Commission.

It is important to note that the *La Belle* archaeologists' fieldnotes in the archive contain much more complexity than the data that are captured in the museum registrar's database (that is, a fourth *La Belle* database, below). Museum curators effect a translation, a different kind of data cleaning, from object database to an interpretative exhibit that presents one of many possible historical facets. In each of my settings, data begin to lose a certain character once taken away from the immediacy of their creation. Some of the details of the *La Belle* data generated at the

Conservation Research Laboratory are shown in both the Bullock and La Salle Odyssey exhibits. However many other details remain contained in the repository, where managers struggle to promote and publicize widely the availability of the field data for research and study. The registrar and curators' selection of one object instead of another, and of one facet instead of another facet of the historical narrative, has an impact on what stories are presented to visitors and the scholarly legacy that those objects accrue. Of the hundreds of collections of objects accessioned in a repository, only some are selected for exhibition. Even though *La Belle* is exceptional, it would be impractical to exhibit all the hundreds of thousands of artifacts. Curators decide, select, and prioritize some artifacts to serve a narrative. Below I analyze how museum staff used previous databases to select objects for exhibition.

A Registrar-Specific Database

There are several stakeholders who have an interest in the documentation of the *La Belle* object collection, and there is a dual ownership to acknowledge (echoing in principle my mention of the contested archives of the Virgin Islands earlier). Some or all of these stakeholders are generating documentation in varied formats which a person will eventually have to integrate. Based on an international treaty executed on 31 March 2003, the country of France retains official property title to *La Belle* and has deposited the collection through the Musée national de la Marine de Rochefort to the long-term care of the Texas Historical Commission (THC). As caretaker of the object collection, the THC oversees permissions and ensures that following their excavation and conservation, the objects will be exhibited both in the United States and eventually in France (likely a selection of exceptional objects). The THC oversees all loans of the collection permanently curated by the Corpus Christi Museum, including those for the state

museum exhibits at the Bullock, and the documentation generated in the course of those activities.

As *La Belle* was readied for piece-by-piece transport to Austin from the conservation laboratory, the state museum retained a project registrar who worked with the project director to select artifacts for an expanded permanent gallery display and to create entries for each individual item in a collection database. The project registrar began with the repository collections manager's database to make these selections but then added new information about objects selected to be exhibited. The design firm chosen to develop the permanent exhibit around the *La Belle* ship hull established a project database concurrent with the effort to produce an exhibit catalog in 2002, based in FileMaker Pro. This version of the database was borrowed from that created anew in Access by the conservators (so that the design firm and the conservators carried out updates in parallel). When the museum's project registrar (June 2013-June 2014) arrived, her main responsibilities were to use the design firm's database copy to fully process the *La Belle* collection: 1. label each item with a THC provenience number (again, not every item left the excavation with a number assigned to it), 2. determine information for Condition Reports, and 3. enter this information into the project database. With regard to step 1, the number would need to include not only that assigned to the entire *La Belle* excavation (Trinomial 41MG86) but most importantly, a provenience number based on when the artifact was recovered during the excavation (these could be supplied by the project registrar following the original THC numbering scheme). The THC number is the only permanent number recognized by all *La Belle* stakeholders, even if an object might have gathered other numbers of secondary importance assigned from the design firm or from the Bullock Museum in the course of the prior creation of the exhibit catalog (Bruseth, 2014). Often the registrar encountered items with multiple numbers,

or items with no number yet assigned by the museum (a unique ID with the year, sequence, and loan number). When the project registrar began this work in 2013, one record would stand in the place of hundreds or thousands of that class of artifacts, e.g., 170 axe heads, 100 cannonballs, or 2000 glass beads. In fact, the design firm's initial database only had 4000 main records – when the total collection volume of *La Belle* is over 1.6 million artifacts. The project registrar ensured that each individual item selected for the exhibit had an entry in the database. With the work of the project registrar having concluded, the museum registrar continues to create and update exhibit records in anticipation of completing the first floor permanent gallery in October 2016 (Mabel, 7/20). The artifact records created for the project are also duplicated for the Bullock Museum's core database. The permanent exhibit may emphasize collection volume, given the scope of the *La Belle* artifacts (e.g., thousands of beads, bells, and rings when most other shipwrecks recover a few dozen) and the many functions the artifacts served (trade, rigging, navigation, hand tools, weaponry).

The project director, who has years of knowledge of the collection, will make the initial selections of particular objects and will work with the collections manager and museum curators to determine which objects will travel for exhibition in France, and which will be displayed in the gallery cases or within the ship hull (e.g., the dolphin cannon or casks). These selections will also be informed by the collections manager's knowledge of the repository version of the *La Belle* database, which the THC shares on an annual basis with the French museum curators per the international treaty. The exhibit-preparation process we have seen in the museum setting has largely been one of selecting a handful of artifacts out of 1.6 million enumerated in prior databases created about the *La Belle* (especially the database maintained by the THC Collections Manager). Data underpinning the object selections are recorded, if anywhere, in staff meeting

minutes. The ship assembly process has been executed according to the conservators' daily logs and overall outline, and the conservators are still using these records to compose a final publication about the reassembly. Both sets of museum-generated records might be collected at a future date once they are made inactive, and added to the *La Belle* collection housed at the Corpus Christi Museum where most of the archival field documentation already is located. There, a researcher constructing an object biography of the bronze cannon raised in 1995 could inspect the object records present in separate (if outdated) excavation, conservation, repository, and museum databases.

We can see in the above paragraphs how a multitude of databases, including a fourth one by the design firm and museum, have thus far been created for a single, large collection as an outcome of the distributed structure of this archaeological project. Even after accounting for the invaluable efforts of a collections manager and a project registrar to normalize or clean errors in the data quality, the sheer proliferation of multiple databases suggests ever more transition points where some data are at serious risk of becoming incompatible with other parts of the data. These transition points may result by no fault of any participant (e.g., technological obsolescence in the case of Re:discovery), but they will manifest when a community of practice involved in later stages of an archaeological project realizes that some key correlation or concordance work – which could have been done in minutes ten years ago but will either take hours now, or, sadly, cannot be done at all – has gone overlooked. The museum and repository communities contend with such issues.

In this chapter I have examined what the contributions are of four communities pertaining to archaeological curation. I began my research with a more expansive idea of what curation

could be than was presented in existing literature, and chose to visit four sites so that I could see what activities they do and whether any continuity existed between the work of distinct communities. The permeation of curation beyond museums was verified in the data through specific evidence of curation activities that occur in the field, conservation lab, and repository as well as museum (RQ1). I was interested in examining to what extent these multiple participants interact with one another in my RQ2, and what I found was that even though multiple actors perform curation, the result is not a continuum of practice – as existing literature and legislation maintain – but rather what I have termed a "discontinuum." My data established that each community creates documentation, and I was interested in my RQ3 in understanding the role of documentation in facilitating curation work. What I discovered is that transfer of this documentation breaks down at particular handoffs. Handoffs are at the heart of my notion of a discontinuum, and I focused in the final section here on detailing the nature of these handoffs. Other factors might play a role in the discontinuum apart from these four handoffs. In the next chapter I will outline the main implications and logical areas for pursuing future research based on my findings. I have situated this dissertation in the field of museum studies as well as archives and archaeology, but I indicate that these findings could be useful to other disciplines addressing similar data issues.

6. Summary and Contributions of the Research

Separate communities of practice exist within archaeological curation, and each prioritizes the creation of different kinds of data and different formats with which to capture and document these data. I characterize four of these communities as constituting a discontinuum of practice and argue that such a situation is problematic because it is impeding the growth and development of archaeological curation as a professional community. Collections care should be not sidelined but integrated at the outset of excavation planning. Additionally, data curators later in the discontinuum should ensure that new data join existing data in a coherent and accessible way, so that discoveries later in the sequence can be combined with original – complementary – contextual information. That is, the problem arises not only with forward-direction transfers of data but also with the lack of mechanisms for sharing data with earlier contributors. Dataset integration in both directions will require greater coordination across the archaeological, conservation, repository, and museum communities. My analysis has followed an occupational approach to articulating distinct recordkeeping practices and studying why particular handoffs occur. While I have explored these practices by gathering the kinds of details museum curators would collect for object-based provenance research (places, dates, and actors), I have also tried to identify structural features, to make connections between the activities I have observed, and to articulate how practices might suggest areas for future work and research. Once gathered, data about objects' provenance can be put to many uses – repatriation, exhibit labels, exhibit catalogs, books, and object biographies among them – each of which generate data as well. I explore some of these broader issues of context and social consequences below. Overall this dissertation makes the claim that archaeological curation extends far beyond museum-specific work in the form of a

discontinuum reinforced by handoffs of data as archaeological objects make the journey from the field to the repository or museum. The discontinuum I present views archaeological curation as a tenuously connected and very distributed practice, and the field's greatest challenge will be overcoming the discontinuities introduced by these handoffs.

SUMMARY OF THE FINDINGS

In using ethnographic methods to carry out this study, I aimed to understand multiple components of curation work, collapsed over a relatively short time (a year) but dispersed at different physical sites. Archaeological curation takes place not just in museum settings but in the field, conservation, and repository settings as well. My findings argue for a reconceptualization of archaeological curation work as it has previously been understood in the literature. Curation, I argue, exists as a discontinuum of related activities and it begins at the moment an object is recovered in the field. The discontinuum comprises four key activities – excavation, conservation, collections care, and exhibition – with documentation generated at each activity. I stress that no one "collections manager" is or should be responsible for all of these component activities, for that person, as Pearce (1990) has shown, is already responsible for other duties apart from the provenance and history of the objects under care. Rather, I see archaeological curation as a field-in-progress with an expansive set of specific contributions by the archaeology, museology, archives, and conservation professions. At present, for a given archaeological project the four activities happen across a long timeline with substantial periods of inactivity (resulting in loss of data from knowledgeable persons) that may not ensure full transition of data from one activity to the next. The findings from this study suggest opportunities to address these issues from the perspective of each community of practice. The

review of literature and related legislation in Chapter 2 showed an existing conceptualization of curation as an isolated activity limited to repositories' collection management policies. Yet I found that curation happens at several stages in archaeology: the archaeologist works to gather enough and sufficiently granular data to detect assemblage patterns (Huvila, 2014), the collections manager documents the material composition of artifacts to ensure their long-term preservation, the museum staff member works to research the provenance of an artifact to interpret it in a museum exhibit, and the conservation scientist works to preserve the structural integrity of fragile materials: to stabilize as well as to clean and reconstruct artifacts. My research shows that curation work has spread beyond the repository, and that multiple professions contribute curation activities through the use of particular technologies. In Table 6 below I summarize the curation contribution each participant makes. I include a column with the professional technologies used to complete the curation contributions to show how data are created and recorded in multiple formats. I recognize that the uses of some technologies do not generalize to an entire field; i.e. tablet computers are far from being a feature of all archaeological excavations.

Table 6. Key Curation Contributions of Each Profession in the Discontinuum.

Profession	Curation Contribution	What Makes These Contributions Possible	Technology Used to Complete Contributions
Excavation	Provenience data (time and place), Project context	Field Database; Data Team; Site history	Digital tablet computers, Paper notebooks, Database, Field Cards, GIS, Total Data Station, Cameras: photo/video, Drones for aerial photography
Conservation	Controlled excavation of artifacts, Stabilization, Condition assessment	Conservation Database, Daily logs and monitoring (before and after treatment)	Adhesives, Abrasives, Picks, Chemicals, Liquids, Microscopes, Vacuum hoods, Conservation Cards, Cameras, Notebooks, Computer database
Collections Care	Collection management, Quantification, Preservation	Excavators' documentation as received, Technology to read paper and digital field data	Acid-free enclosures of large and small sizes, HVAC system, Environmental control, Computer database
Exhibition	Storytelling; Public engagement	Project Database, Results of scientific & scholarly analysis, Choice of narrative, Provenance research	Sense of scale, Physical mounts, Touch screens, Interactions with curators, Project and collection databases

I initially anticipated observing each key activity primarily at one research site. Instead, activities significantly overlapped and were not confined to the institutional setting where one might have expected them to be completed. The overlap was especially apparent in the state museum, which brought together excavation, conservation, collections care, and exhibition. New data about objects were created at the excavation, at the conservation lab, at the repository, and

in the special exhibition space of the museum. Each curation contribution is distinct and performed at different times (hence the discontinuum), but the data generated are complementary and cumulative.

The data obtained during excavation impact the kind of scholarly research possible later in the discontinuum, e.g., when a museum curator accesses these data to prepare a museum exhibit. CRM firms assemble a large amount of documentation according to the specifications of a repository, which as we saw is primarily interested in quantifying the collection's physical size. Collections managers at the state level create guidelines so that repositories will collect information on curated collections in a uniform way (Jones, 2015). Conservators complete the excavation of delicate objects, stabilize, and assess their condition – producing new data contributions to archaeological curation. The conservators' documentation complements that created by the archaeologists, whether in database or paper card formats.

Each activity is most directly meaningful to the participant who performed the activity. The excavator excavates in pursuit of research questions that are best answered by an investigation of the material record, and then physically hands off the excavated materials and documentation to a conservator, curator, or archivist; intellectually, the excavator's engagement with those materials continues long after an excavation is over for a process of study for publication. Archaeologists remain most influenced by the pressures of their home discipline and membership in the archaeological community, and have come to respect archaeological collections mainly for their ability to support particular forms of scholarship, such as in the forms of site reports or journal articles. Because the archaeologist may never interact directly with a museum curator or an archivist, she may never become aware of issues that surface later in the objects' path from the field to the repository related to poor documentation of environmental

conditions on the day of discovery. Conservators' work is reversible as far as possible, so that future professionals will know if the appearance and durability of an object has been altered, and in what ways.

The fact that each of these participants currently operates largely in an uncoordinated fashion, directed by different communities of practice, is a problem that future research could continue to investigate. Existing research about the "curation crisis" by scholars such as Childs (1995, 2004) and Merriman and Swain (1999) did not specify where along the object path the problem occurs, and did not approach this issue as a problem of data transfer between professional communities. My study identifies four problematic handoffs. I found that multiple actors do curation activities, but coordination of this work breaks down at specific handoffs where the format of data undergoes major change. Because one phase of work largely ended before another began in the case of *La Belle* (e.g., excavation prior to conservation prior to repository collections care), each community produced an individual database, in parallel, rather than contributing to a single agglomerative database that all communities could access simultaneously. In the current situation, each profession uses different data, and in the case study of *La Belle*, has produced "dueling" databases suited best for their own needs. What this distributed approach to object curation means for interested scholars is that the source material on archaeological collections is constructed unevenly. Each of four groups of professionals has constructed a particular meaning of the artifacts, made use of particular kinds of data most useful for present needs, and ignored or (intentionally or not) discarded other kinds of data not found to be useful for those needs. The absence of a structure concerned with oversight for archaeological collections means that we must confront uneven coverage of our histories from archaeological heritage evidence, coverage which biases and privileges some stories over others.

Below I articulate the areas of scholarship to which my research contributes. I recognize multiple areas here given that my research was informed by literature from museums, archives, and archaeology. The findings also may inform work in related disciplines.

CONTRIBUTIONS OF THE STUDY

This work examined the contributions of four professional communities to archaeological curation and analyzed how the form and use of each community's documentation practices created particular handoff situations. Each of these communities of practice creates data that meet the needs and concerns of their own profession, but the lack of a consistent data format results in extra work hours and delays elsewhere due to time spent reformatting, errors resulting from this added process, and loss of incompatible data. Having noted scholars' assertions of a "curation crisis" built over three decades, I examined current practices empirically and found that curation contributors create data in multiple formats. I found that these data remain compartmentalized within specific communities of practice and are not structured in a mutually comprehensible manner to users outside of the creator community. As a result, subsequent communities make decisions about objects without having the full complement of data to support telling a more complete story of particular objects. In this section I describe five specific scholarly contributions of the study: (1) law has a role in shaping what activities participants carry out, (2) the lack of a standard technology for recording object data reinforces path discontinuities, (3) within each profession exist incentive systems at the disciplinary level that impact daily decision-making with regard to curating objects and documentation, (4) the curation activities that I identify have far-reaching impact on a national level, and (5) archaeological

curation work is a discontinuous yet collective practice spanning multiple professions that object biographies help to reveal.

Legal Requirements Shaping Data Handoffs

This study finds that laws shape what kinds of activities archaeologists and subsequent curation participants carry out with objects and documentation. The federal preservation system now in place as a result of the passage of the NHPA of 1966 as well as the Antiquities Act includes State Historic Preservation Offices (SHPO) that approve permits for archaeological work to be contracted and carried out in the United States, mostly by CRM firms and archaeologists. Rather than focus on issues within these laws, I will discuss here some possible avenues for changing pertinent regulations. The CRM archaeological landscape is directly governed by the legal regulations in place, as is academic archaeology in which these regulations are also adopted but implemented at a slower pace. The laws attempt to structure the transfer of archaeological objects in a responsible and consistent way, guiding archaeologists to identify and assign all objects to a regulated repository for permanent and long-term collections care. Yet the regulations that shape the course of archaeological work leading up to that stage of depositing a collection can be quite variable. Prior studies from Sullivan (1992) and Childs and Corcoran (2000) demonstrate that states have made enormous strides over the past twenty years to improve the capacity for repositories to provide collections care for an ever-growing volume of archaeological materials, including digital data. Still, repositories both across states and even within a single state (such as the fourteen in Texas) impose institution-specific requirements on how the objects and documentation must be presented to the repository as a precondition to accessioning the material long-term. We saw this most clearly articulated by Project Director

Nathan in Handoff 1, who discussed the "fair amount of variability in how the curation facilities want the artifacts sorted" and the resulting work that his firm performs in order to prepare project collections according to one repository's standards. We might focus future research efforts on gaining a better sense of the total variability of these requirements and seeing in what ways such a typology of major differences produces the end result of requiring archaeologists to complete reformatting of data as obtained from fieldwork. Within the repository community, scholars and collections managers could then work together to amend these regulations on new collection data so that they are consistent with modern fieldwork practices.

In addition to regulations at the repository level, I also find that the SHPO offices follow a set of regulations in approving the work that would result in an archaeological collection being eventually created. For example if a CRM firm submits a report that is not granted a permit following Section 106 review by a SHPO, the firm may have to do additional work. SHPO professionals normally follow a set of practices to underpin and guide these decisions in a uniform way, and we should recognize that in so doing these professionals form a community of practice whose work would well deserve further and larger-scale investigation (see Galloway, 2015).

In Handoff 1, regarding the exchange from excavation to state repository, I found that the CRM excavators made efforts to present data in a way that they believed was acceptable to a repository. These efforts were structured according to documentation made available from a given repository that outlines specific procedures for preparing collections. Similarly in Handoff 3, conservators of *La Belle* presented their Access database regularly to a (different) repository. Then, the repository collections manager made additions to this database – keeping the Access platform – by adding data received from other sources within the project. The work of the

collections manager reflects his application of the SHPO community's preferences for managing data about archaeological collections in the aggregate, which as Neumann, Sanford, and Harry (2001) discuss is now a peer-reviewed endeavor that directly contributes to scholarship in archaeology and other disciplines.

Lack of a Standard Technology Across the Object and Documentation Paths

In the literature, I showed how Sullivan and Childs (2003) align themselves with Barker (2010) in arguing for the recognition of archaeological curation as a field of study concerned with curation practices. Part of the resistance to this term that these scholars are attempting to counter stems from the previous assumption that curation work is limited to repository settings – and more significantly, that archaeologists and conservators' work is removed from and has no bearing on the success of curation work. However, my research has shown that this is not the case. Not only are archaeologists and conservators performing curation, but the data created in the course of their duties are meaningful beyond the first workplace and beyond the period of time of direct work with the objects. Evans, McKemmish, and Bhoday (2005), who explored this problem in the digital recordkeeping arena in the Clever Recordkeeping Metadata project, found that current business practices and records management systems burden archivists by failing to support metadata reuse and automated methods of inheriting metadata rather than recreating it multiple times prior to its arrival at an archives. Their prototype builds in interoperability with existing office and workflow tools, and has the broader result of recognizing multiple provenances as data and metadata are enhanced at each stage. My work has shown that people interested in using another community's data need to read and interpret the data as originally created, but far too often the communities encounter data that are not compatible with the

technologies that they use. We see this in several instances of "dueling" databases created by participants who find previous iterations of the data unusable and would prefer instead to create a separate database structured according to a new set of needs. In choosing to characterize four of these communities as a discontinuum of practice, I am positing that the present situation is burdened by specific challenges that each community can work to overcome in order to support the growth and development of archaeological curation as a field.

Archival scholars are quick to recognize that data practices do change over time, and the ability to assign provenance to digital records is even more complicated than for paper records (Bailey, 2013). Changes in the characteristics of data become especially apparent in the case of long-term projects, such as I have shown in the twenty-year span of work carried out to excavate, conserve, and most recently exhibit the *La Belle* ship. The archivist's responsibility for providing perpetual access to the materials is never entirely complete, and it is one that requires continual maintenance of technologies so that scholars can read and interpret the documentation generated from all stages of an archaeological project. Collection managers and archivists, by professional definition, are tasked with acquiring both a full set of original documentation and acquiring the technological means for providing access to those multiple formats in perpetuity. Yet prior to such acquisition, I have shown that objects and documentation have followed distinct curation journeys. Because archaeological project teams are large and change from season to season (the field season at Morgantina had 43 participants), it may be that the one member of that team who eventually submits the field collection to a collecting repository is simply unaware of or unable to obtain all of the fieldnotes generated by all members of the team – even if crucial data points are contained in those data that cannot be reconstructed otherwise. In my analysis of the conservators' community of practice in the first section of Chapter 5 (RQ1), with regard to *La*

Belle, we saw conservators discovering that the reasons why field data was so inconsistent (and required exporting and importing data into a new platform) were because (1) excavators lacked a protocol for recording object quantities, and (2) excavators captured data in paper records and in Word and Excel documents to supplement the limitations of the Re:discovery database used in the field. Overall what my work finds is that excavators, conservators, collections managers, and exhibit makers use different technologies (summarized in Table 6) to perform curation activities and that it is very difficult to coordinate technologies across these professions over a span of decades. Both the technologies and the data requirements are constantly changing as different professionals enter and exit a project. Yet what remain constant are the legal requirements in place that effectively keep objects and documents firmly tracked along separate paths – specifically, the objects remain stationary on shelves or in field boxes (in the country of origin) even as archaeologists and scholars create a widening bundle of documentation about those objects that is distributed, uncoordinated, and possibly unknown to others.

In Figure 11 below, I illustrate the widening, or exploding, data and metadata that an archaeological collection should accumulate over the course of its journey from the field to a museum. I include the four curation activities that I have analyzed, beginning with objects' excavation and concluding with their exhibition. Subsequent activities contain the data from one or more prior activities, including both original (archival) and expanded versions of datasets. Each of the selected data contributions listed on the right side are data that will continue to be generated over time and that we should expect to be accessioned into a repository. This ideal of a widening dataset represents what curation professionals might anticipate and hope to foster for each archaeological collection of historical significance.

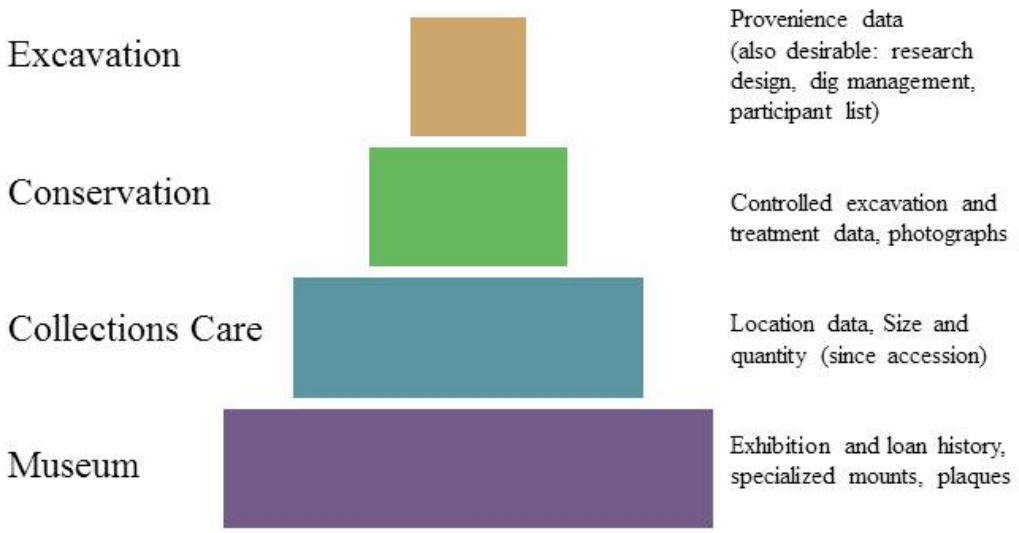


Figure 11. Widening Accumulation of Collection Data Across Time

The object carries the physical role of being the material source for scholars to study the history represented by that object, and the role of data is to document that history through specific data points pertinent to the object's presence and identity (its provenience, context, and composition). Provenience data alone has taken many forms over the past three centuries (Lyman, 2012) and looks very different for collection documents accessioned in 1910 and for a collection accessioned in 2015. Not only are the data heterogeneous (Geiger and Ribes, 2011) for archaeological collections, but different individuals have manipulated those data over years or decades in ways that are driven by the rewards, punishments, goals, and incentives of their profession or home discipline. In using the communities of practice framework (Lave and Wenger, 1991), I was able to discover the distinct perspectives each profession holds regarding how to handle archaeological data. Based on recognizing these perspectives, I have shown that each professional will interact differently with an object. Recognition that these different perspectives persist and will not soon be made uniform has implications for what kind of

solutions we might recommend. For one, implementing a common database for all participants to use will not be effective because each profession will still use the data in that database for different purposes. Each profession makes use of the same technologies in different ways – seen clearly in the case of Access by both the conservators and collections managers in Handoff 3 – but also these technologies become subject to influential procedures for implementation at the disciplinary level.

Incentives at the Disciplinary Level

This study reveals that the issues affecting the coordination of archaeological curation efforts are multi-faceted and include technical, social, and pedagogical issues. While I will discuss a future role for enhancing curation pedagogy in a subsequent section below – and would even argue that the largest barrier the field faces is translating such pedagogy to praxis – here I emphasize the social and disciplinary issues that partially contribute to the problem. Excavators, conservators, collections managers, and exhibit makers perform specific activities because the rewards received for those efforts are contingent on having carried out the work in a certain way, to meet a certain set of expectations within a reward system. Professional conservators, for example, allocate the time available to perform conservation treatments for materials under their care according to stated priorities because the conservators aim to be recognized for having performed the treatments efficiently and skillfully. Based on Lave and Wenger's (1991) social learning framework, we can also see why conservators seek to develop expertise in core and supporting areas of practice such as chemistry or materials science: because such knowledge will elevate the opportunities for professional recognition and reward for their conservation work.

If we accept that all stages of the curation discontinuum are addressable, we might begin by dedicating resources for excavators and partners at the early planning stages of an archaeological project. These resources should enable excavators to collect data in an efficient and systematic manner using technologies that are legible and accessible to others beyond the field site. Building in the capacity for collecting more legible data (e.g. databases that are not tied to proprietary software) will be a more impactful improvement than even the hiring of a project archivist or metadata librarian by an archaeologist for a field season, because if the archaeologist learns how to make use of this capacity for her own research purposes, she will carry the knowledge gained about handling data forward in her future archaeological work. As Childs has elucidated in *Our Collective Responsibility* (2004), archaeologists must take up responsibility for practicing responsible curation in daily work activities; it should not be ethically, professionally acceptable to assign all curation tasks to a collaborator – especially one who is separated by years or geography from the original fieldwork. If more archaeologists could practice responsible curation (in the field, this might take the form of using multiple means to record provenience data in databases), the problem would in such cases be addressed early in the project, thus avoiding the persistence of authentic errors in the data that were not caught by the archaeologist (the only individual who would be able to say whether something was recorded in error). Too often, and especially in distributed work environments such as I find in the case of the *La Belle* project, such issues are either never caught or are caught too late. In Handoff 3 I find that the collections manager is best positioned to "catch" inconsistencies as she works to integrate all of the sources of project data into a single place, but also that such work can consume hours in excess of those allotted to this particular work task. One collections manager stated that had an

excavator “taken five more minutes,” hours of work time in the repository could have been saved.

Retention of a project archivist or metadata librarian is a good alternative step (since changing disciplinary mindset also takes time), but it carries the obligation of fully integrating that archivist into all data procedures that occur within a single excavation (which as we saw at Morgantina can encompass five or more working teams). Another area besides excavation in which my findings point to the need to focus resources is at the later stages of curation, particularly the work of archivists and collection managers. When an archivist encounters materials that are unlabeled, s/he must gather the submitted documentation and consult outside resources and publications in order to complete the labeling to the extent possible. These procedures take time, and would benefit from increased funding for archivists to conduct such research and maintain the digital resources that have been put in place for sharing provenance data online: e.g. the Getty Provenance Index®, and other art historical and archaeological resources accessed by curators (Reed, 2013).

Additionally, the issues highlighted by the core findings of this study are present across four professions that I have analyzed, and so might not be easily solved by implementing a single technical system that all four could find usable. Research in the fields of management and organizational studies of the implementation of enterprise resource planning (ERP) software represents one established approach to the issue I have surfaced regarding problematic handoffs. An ERP system comprises various business applications implemented to store and provide access to data pertinent for activities such as manufacturing, marketing, and accounting. With an ERP system in place, the range of potential users is as equally siloed as I have found in the contexts of my study. Acknowledging possible similarities between archaeological curation and

typical business activities – business research (for curation: various archaeological participants), manufacturing (archaeologists building a site plan), marketing (museum staff), and management (collections managers among others) – does provide us with another way of considering whether the enterprise of archaeological curation is or can be a single field. Scholars such as Hong and Kim (2002) and Soh, Kien, and Tay-Yap (2000), among others, have shown that the success of ERP efforts hinges on organizational fit but that, overall, ERP efforts have had some success in connecting many corporate applications housed in dispersed organizational units and geographic locations. Introducing ERP software to the field of archaeological curation would be an incomplete solution, though, not only because it would ignore the material and physical demands of archaeological objects that cannot be captured in any database, but also because of my finding that each of the users of that system are working toward different goals directed by his or her discipline (i.e., conservation, or museum exhibition) rather than one institutional mission and vision, nor are all participants affiliated with or housed in the same organization. While I found that archaeological curation is multi-sited and is not limited to the museum setting that Pearce (1990) might constrain it to, curation sites are not unified in their mission or relationship to archaeological data – not even the pairing of museums and archives, to the dismay of Merriman and Swain (1999). Successful ERP implementations rely on pre-existing and mutual agreement regarding the goals and uses of the data contained in such a system, which I do not find at present for archaeological curation.

The existing disciplinary approaches and incentives are the major issues that shape the handoffs I have identified in this study. This study has viewed the activities observed at research sites as representative of cultural institutions and the disciplines of archival and museum studies, but future work might more closely peer within each site and examine any intra-community

handoffs that might be present as an organizational issue. Instead of the occupational lens through which I have analyzed across disciplines, future research could apply an organizational lens to work toward systematizing and normalizing the work occurring within a project so that it is cross-compatible with procedures in place at peer organizations (e.g. excavations of a similar size as Morgantina, and conservation labs with a similar range of treatment capacities). The conservation lab and excavation organizations have structures in place that support the behaviors I have seen, and we might critically identify ways to make structural changes that would support behaviors more recognizable to partnering institutions that will encounter the data before or after the particular organization.

The Broadening Public Impact of Curation Work

Though there is very little infrastructure supporting the professional practice of curating archaeological collections from the field site to the museum, public audiences *outside of* these professions compel and impress upon the curators that the state of "crisis" has not yet abated and indeed may be aggravated by the complexities of preserving digital data. That is, archaeological curators work under the pressures of institutional and national politics where provenance research for objects can have an immediate and significant impact on people's lives. Repatriation, a culminating action greater than the sum of these parts, is one form of such impact, as are other outcomes which this labor can make possible if the objects under study eventually remain in the originating place of the research – publications such as exhibit catalogs, books, and object biographies. These latter outputs garner much less media attention than does a repatriation act, which may be accompanied by a public ceremony and presented as a success story of diplomacy (Flintoff, 2016). As one scholar writes, "A simple statement that American-

made films have been stored overseas, packed up, and shipped can be transformed into a publicity triumph by proclaiming the discovery of lost treasures to be 'repatriated' and united with a grateful nation." (Frick, 2014). Films such as *The Monuments Men* (2014) and *Woman in Gold* (2015) tell stories highlighting the power of provenance and eventual repatriation in American history (see Mattern, 2011). Simply put, these outcomes and the actions made possible, especially repatriation, rely on specific data and documentation being preserved long-term. Museums' collective interest in provenance research has risen over the past two decades, since high-profile repatriation cases have made this issue central. The Smithsonian Institution, for example, prepares hundreds of ethnographic object summaries each year to federally recognized tribes in the United States and has repatriated many of these objects (Smithsonian Institution, 2016). Museum collections bear evidence of our fascination and preoccupation with objects, and how we use these objects to tell stories about our lives. Museums are places where people go to see these objects and appreciate a view on the human past. In addition to objects, documents and sketches are a part of this story, and some superior museum archaeology exhibits find a way to show this side of the work of the archaeologist alongside the history told by the objects alone. My study was informed by a recognition that collections provenance research can form the basis for consequential actions with contested objects including the circumstances of their exhibition.

Multiple Occupational Perspectives Comprise Archaeological Curation

We know that provenance research is the act of compiling data about each activity that occurred at multiple stages of the object's "itinerary" to a museum, and that it involves actively assembling together a disparate set of clues, steps, pieces of paper, and details from disparate

sources. The assembling process itself "takes time, reflection, and creative detective work" (Milosch, 2014) and there is no yet charted path for carrying out this labor. In this study, I seized upon this kind of work to explore how at least four activities are part of the process of archaeological curation. In characterizing the archaeological curation situation as a discontinuum, I contend that communities are carrying out parts of curation work and in fact provenance research already, even though they do not characterize their work in this way. Each of the databases created by excavators, conservators, collections managers, and museum registrars contains data that describe different aspects of archaeological objects, a finding that reveals that curation does not only occur within the controlled settings of a museum or repository.

By better understanding what data are produced in the course of archaeological work and activities related to curating objects, I am able to locate these data along a discontinuum. My attention to data is directed toward the goal of understanding what professional practices make up archaeological curation work – both how it currently exists and how it might be impacted in the near future as collection volume continues to increase and new quantities and formats of digital data are captured in the course of archaeological work. Museums will play an important role in growing this nascent field, but the data creator communities of archaeology and conservation can also work to ensure legibility and interpretability of their data. Below I explore some future research directions which would foster connections and strategic work to overcome handoffs between, and also within, disciplines.

RECOMMENDATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

The discontinuum recognizes that curation is not at present seamless, and that particular handoffs make the continuum dysfunctional. This study was situated in the realm of museums but the nature of the findings will be of interest to other communities with similar data structures in place, including studies of workplaces and infrastructure. A logical area for follow-up would be to examine the portability of the discontinuum model in studying communities where multiple technologies are used as boundary objects to create data, e.g., in citizen science. Bates, Goodale, and Lin (2015) introduced the technique of process-mapping in their study of weather and climate data, and future work could take this form of analysis.

Based on finding what data are produced and by whom, future work can explore how these data are put to use. Some data might be better utilized if they were available at different points along the spectrum of archaeological curation work. For instance, archaeologists' field notebooks containing first-hand observations and sketches would enrich a display of artifacts in an exhibit, but notebooks are not commonly displayed in as sophisticated a manner as artifacts. In contemplating what stages of the curation process are addressable, we should focus more on identifying particular activities archaeologists can carry out. As well, we should continue to focus resources on supporting the later work and project involvement of professional archivists and collections managers. Another area for future research concerns why archaeologists capture different data in different formats. Tension between digital, paper, conversation, drawing, and narrative in field recording that was not fully explored here would be worthwhile to pursue next.

In the repository setting, collections managers may spend hours re-sorting a bag of objects, a task that would take the appropriate archaeologist minutes. Future work might further explore the kinds of "five minute work" that an archaeologist could perform, barring problems from looting or theft on the site, that would be of most benefit to the collections manager.

Repository managers lack the mechanisms that archivists enjoy to make archaeological materials known to the general public (e.g., finding aid data structures and aggregators). A similar professional infrastructure for communicating the availability of archaeological collections is yet to emerge.

Additionally, future work could examine how the public interacts, perhaps indirectly, with curation data, particularly through the interface of museums' exhibit labels, catalog records, and exhibition catalogs. This direction connects with current calls for more critical data studies (Dalton and Thatcher, 2014). An example of such work is Art Tracks, a museum project to develop ways to express provenance information as structured data (Berg-Fulton, Newbury, and Snyder, 2015). Despite their sparse appearance in museum gallery spaces, exhibit labels – and particularly their inclusion of provenance information – are a form of discourse that is not neutral. Exhibit labels mask entire histories, revolutions, and cultural movements in the span of a few lines and punctuation marks. As a document genre, provenance labels follow a simple structure, "with information grammatically compressed into a string of owners' names separated by semicolons" (Higgonet, 2012: 195), but their power as evidence of commoditization should be fully acknowledged, particularly in cases involving sins of omission. Provenance labels give the dedicated scholar and the interested reader a whole new dimension with which to appreciate original archaeological objects, though such labels currently require one to have a certain kind of education. Future work on provenance research may choose to approach it less as neutral evidence of ownership and more as a source of transformative knowledge, revealing embedded values and exposing the conditions of an object's creation, collection, and exhibition.

Archivists and curators recognize the value of preserving the provenance relationships that exist between documentation and objects − and if objects must be physically separated, the

benefits of making the relationship and connections more explicit to researchers (Rudolph, 2011). Future study might examine applying the concept of the "archival bond," as discussed by Duranti (1997), to archaeological objects and their documentation in cases where the museum might be hesitant to accession archival documents. (This is the more likely scenario, considering that archives might be less equipped to provide long-term archaeological collections care than are museums to store mass amounts of documents). As Rudolph (2011: 29) explains, the concept holds that "records should be valued for their relationship with other records rather than just their existence as autonomous entities." Such a relationship recalls the discussion in Chapter 2 of this dissertation of the crucial importance of provenience data to archaeology − without this information, museums are hesitant to accession archaeological artifacts. Provenience data are contained in paper and digital documentation, and if documentation is physically separated from the objects without the museum curator's knowledge, the objects lose much of their research and scholarly appeal and may fail to meet a museum's accession requirements.

Finally, future efforts might contribute to the development of new training and professional development activities to better equip future archaeological curators and archivists. This dissertation was not purposed to produce examples of such training activities (i.e. as improvements) but instead was a broad study of the current state of field practices so that researchers can see where this work occurs now. Curation scholar Terry Childs suggests we might carry out research to better coordinate work across repositories:

> ...establish a professional organization of archaeological repositories, so they could work together on issues like how to standardize our fee system and site records, communicate better with contractors, streamline some of the curatorial activities, ... rehouse [items when] there's

no funding for it, [address] orphaned items because of permitting issues. (communication, 3/31).

Creating a professional infrastructure for archaeological curation, as suggested by recent efforts led by the Council for the Preservation of Anthropological Records (CoPAR) related to fieldnotes, would be a useful future development which would help sustain growth in this area. Researchers should attend to specific qualities of fieldnotes from archaeology distinct from those in anthropology. The discontinuum is problematic because of data handoffs, and we should not replicate the discontinuum but instead work to mend existing procedures and support collaborative efforts. My four handoffs provide a starting place to focus these efforts, and next I will outline specific directions suggested by my findings.

Provenance Research and its Consequences

Provenance research is shaping where museums expend their resources. As archives and archaeology have arguably made a religion of provenance (explored in Chapter 2), here I primarily explore future applications in the context of museums which house archaeological or art collections. Although the archaeological case may be less troubled by monetary values than in art, I consider the two here both because some museums overlook this distinction and because it is archaeological work which fundamentally leads to new knowledge discoveries both in the art field and in studies of culture. An interest in provenance research is attested in the archaeological and art historical fields for as long as scholars have sought to establish chains of ownership for a given work. Scholars and participants in the art and antiquities markets continue to recognize that the establishment of such a chain substantiates an object's authenticity or

attribution. In the mid-twentieth century, researchers at museums needed to consult catalogs from exhibitions, auctions, and museum inventories. A groundswell of support arose in support of new resources to share this information online, including the Getty Provenance Index® and handbooks for interpreting physical marks of provenance in books and manuscripts (Buchanan, 2011). Practitioners of provenance research soon noted how difficult this work was to do alone, as it requires the researcher to use tools developed by various research communities including library catalogs, auction sale indexes, and private biographies (Lessing, 2000). Yet most archaeologists have only been exposed to the concept of provenance in the context of the illegal antiquities market. The museum relation to the antiquities market changed in a major way in the 1990s, as a result of illegal trade and forgery cases. The Getty Museum's announcement in 1994 that it would no longer purchase unprovenanced antiquities, and landmark publications exposing previous acquisitions of forged objects that had gone unchecked (Pelagatti and Bell, 1996; Kokkou, 1993) effectively made provenance an important matter to the archaeological community. As Feigenbaum and Reist (2012: 1) convey it, "lightning struck what had seemed a quiet, essentially antiquarian pursuit." Provenance research then gained stature as museums decided overtly to rededicate efforts to thoroughly investigating the documentation history of objects already present in museum collections as well as for those objects surfacing on the market for sale that would be of interest for possible acquisition. As a result of these efforts, American museums have repatriated hundreds of objects to their countries of origin. Collecting institutions continue to participate in provenance research efforts, as detailed in a recent special issue of *Collections: A Journal for Museum and Archives Professionals* (Clark, 2014). Recent data visualization efforts reveal relationships across these original sources that shed light on nationwide, programmatic histories and promise more public transparency around large

antiquities collections (Posner et al., 2015). Museum visitors and funders now make demands on museums to deliver transparency, data, and restitution: claims that require expenditures of time and resources. These issues remain unsolved, and while institutional practices do not change overnight, small shifts in thinking may ultimately lay groundwork for larger change.

At the same time, I acknowledge a tension between this kind of analysis and provenance research at the individual object level and the higher level of assemblages at which archaeologists may focus their research. The shift among archaeologists to studying assemblages and relationships across sites is paralleled in archival practice, where archivists have turned away from granular descriptions to collection-level processing (Greene and Meissner, 2005). I suggest here not that provenance research be carried out for every archaeological collection, which is not only unfeasible for reasons of time but also impossible for accessioned collections which are not accompanied by fieldnotes or detailed provenience data. Rather, I am acknowledging that museums are continuing to invest in this work for those objects the museum considers to be "exceptional" – a term that an institution may interpret broadly (applied to every object in the permanent collection) or in a limited scope (for objects that are contested, questionable, without documentation, or significant in some way). Very few archaeological objects will become the focus of such detailed and exhaustive provenance research, but for those few, provenance researchers will work to create a rich object biography. Storytelling in a museum with contested objects will be more compelling when these stories contain the fullest complement of data from all of the paths traveled and contained within the history of that object.

Pedagogy: Curation Education in Archaeology

There still exists a gap of curation education in the field of archaeology (Bender and

Smith, 2000; Bustard, 2000). The topic of curation is rarely addressed in professional archaeological meetings (McManamon, 2015 notwithstanding) and it is thought of as museum work. Librarians, too, provide instruction and support to museum curators and provenance researchers. In order to help archaeologists make sense of what they encounter in their own storerooms, curators' toolkits of the future could expand to include a wider spectrum of skills and digital practices. Archaeological curation curricula could address both past and current archaeological theory and archival theory in order to cope with the management of archaeological archives. Future work might ask if archaeologists should obtain archival and museum skills (Sparks, 2010), and conversely, if museum curators and archivists should obtain archaeological skills. An introduction to archaeological data could be integrated into graduate education programs. Dallas (2015) lays out an ambitious agenda upon which we might explore the changing boundaries of digital curation through longitudinal archaeological excavation projects such as Çatalhöyük, a UNESCO World Heritage Site first excavated in 1961. Additionally, two archaeology data repositories, Digital Antiquity's The Digital Archeological Record (tDAR) and the Alexandria Archive Institute's (AAI) Open Context, offer archaeologists distinct options for managing and providing open access to the data generated through excavation and study (Sheehan, 2015). While these repositories cannot help with data that were never collected or recorded, the repositories do facilitate standardization of complex data according to archaeological schema that will support data sharing in both directions, especially from museums to archaeologists.

Paralleling this discussion of the *creation* of complex archaeological data, future efforts may also consider what role data-sharing among archaeologists, and more broadly anthropologists, has in building scholarship. Some are resistant to share data publicly because

projects have not reached "done" status, the data may not have great legibility, the data may have reproducibility, privacy or misuse concerns (Fowler, Parezo, and Ruwell, 1996), and the data creators do not agree on taxonomies. Biases on the part of both archaeologists and museum visitors may lean towards exhibiting a few, "museum-quality" star objects even if they take resources away from the majority of less spectacular finds. Many private papers of researchers, from archaeology and other disciplines, are never submitted to an institutional archive (Kaye et al., 2006: 280). The Committee on the History of Archaeology, Society for American Archaeology, has taken a particular interest in studying these records. Educators can teach archaeologists to proactively plan for the data curation of the materials recovered from their excavation projects and identify a repository or archive that will properly curate the data. The sooner a curation plan is decided upon for an excavation, the more assurance a project director has that that there will be resources available when objects most need them. Often, collections care planning does not occur, and while a conservator brought in late to the project is better than no conservator at all, the work and time required of all participants could be better spent with the advantage of pre-planning (Young, 2000). For excavation project teams, all parties involved in the work would agree on what kind of data is to be recorded, the database technology with which to record that data, and the personal responsibilities for ensuring that the data is captured according to plan.

In addition to the work of the Society for American Archaeology, an interdisciplinary conference held in early 1992 titled "Preserving the Anthropological Record: Issues and Strategies" resulted in a synthetic volume on the field's material issues, as well as the launch of the non-profit Council for the Preservation of Anthropological Records (CoPAR) (Parezo,

1999).[20] Archaeological excavation records form one component of CoPAR's work, which seeks to match collections of unpublished, unrepeatable anthropological records from field ethnography with manuscript repositories that will accept them. Through this work, and a directory of such collections, CoPAR serves an important role in bridging the gap between the archival profession and archaeology (Galloway, 2010). Educational activities within the Society of American Archivists as far as archaeology is concerned focus mostly on professional education for managing textual and photographic records (Bowling, 1990; Boyer, Cheetham, and Johnson, 2011; Clarke, 2009; and for artifacts, von Salis, Bauer, Stoudt, and Walton, 2012), though ongoing research around archiving complex digital objects indicates the potential for future expertise sharing among digitally-inclined archaeologists and archivists. Archaeologists are just beginning to explore the use of websites to make born-digital archaeological data accessible, e.g., in the Gabii Project (Clarke, 2014; Opitz, Terrenato, and Limp, 2014).

Museum Archaeology in Practice: Improving Collaboration

My research also can inform future work in museum studies, particularly in understanding the relationship between curation work practices and exhibition. Innovative research has recently examined what effects different curatorial and spatial reconfigurations had on visitor attention, measured using tools familiar from Human-Computer Interaction (Tröndle, Greenwood, Bitterli, and van den Berg, 2014; and more generally, Cole, 2012). These studies allow curators to critically reflect on their own practice, propose new ways to educate future curators, and sustain important relationships with neighboring communities (Huster, 2013;

[20] The conference "Revitalizing CoPAR for the Digital Age" was held 2-3 June 2016.

Hafner, 2010). More broadly, Rounds (2012) has shown that new approaches are needed that do not represent museum work as simple processes but rather account for the dynamic environments in which museums operate today. Michalski (1994: 8) suggests that museums pursue integration at two levels so as to achieve the museum's continuing three-part mission (preservation, study, and communication): one at the level of preserving the collection "as material, concrete things," and another a step higher which would integrate preservation with the other two core museum activities. When combined with the use and availability of techniques such as 3D printing and WebRTIviewer as masterfully employed by Milner et al. (2016), museum professionals can tell new stories and create educational lessons with collections. Archaeologists are leading the production of these information-rich resources, but there are significant barriers to maintaining this particular kind of complex digital data that will benefit from collaborative approaches. For example, museums are beginning to contribute new digital preservation best practices (James, 2016; also Meraz, 1997; Marty, 2010). Technologies in archaeology have a certain amount of subjectivity built in purposefully, as they invite the reader to construct their own interpretation by controlling presentation of the data. This is seen in archaeological site simulations, visualizations, and interactive viewers for digital photography (Mudge, 2012), which shift the power of interpretation back to the participant, affordances that are still constructed by design. We might examine how these technologies support museums' educational missions, especially in response to challenging events (Davies, Paton, and O'Sullivan, 2013; Agnew and Bridgland, 2006: 2; Saunders, 2014).

At the same time, there are also consequences to collaboration, and it is important to recognize that curation work is neither easy nor standardized. Among the specific issues highlighted in this study are the proliferation of databases from the field to the repository,

archaeologists' decision-making process to select a repository for collections care, and the extended timeline needed to complete conservation work when artifacts are simultaneously in demand for exhibition and scholarly analysis. My study shows many examples of communities of practice struggling to collaborate, from conservators exporting and importing an archaeologists' database into a different format and mechanism for access, to repository managers integrating unique numbering schemes from multiple databases, to museum staff accessing archival records from an excavation to contextualize a gallery exhibit. Improved curation practices have implications for the use of art and archaeological objects by communities as well as by educators. Making provenance data more accessible – especially for interesting or controversial objects – may increase public engagement and attendance in museums (McMullen, 2008; Elia, 1992). Worldwide initiatives such as International Archaeology Day and the Archaeological Institute of America's Day of Archaeology (as well as U.S. State Archaeology Months and the U.S. Forest Service's Passport in Time amateur digs) have successfully introduced museum-goers to a more realistic view of what archaeology entails (countering false perceptions on television and on film). Evaluations of these efforts reveal that archaeology and its digital practices remain poorly understood by the general public. My research has illustrated a case of effective public engagement with curation work, and shown that public presentations of the end-results of laborious provenance research matter.

CONCLUSION

This study examined archaeological curation as a complex work practice. It studied multiple components of this work at locations where distinct disciplinary modes of

communication exist regarding archaeological data. Archaeological curation takes place not just in museum settings but in the fieldwork, laboratory, and repository settings as well. Key handoffs occur between excavation and repository custody, excavation and conservation, conservation and collections care, and in preparing a museum exhibit. These handoffs are the basis of a new conceptual frame I call a discontinuum. Archaeological curation is not an activity that occurs smoothly in isolation but is rather a discontinuum involving four activities carried out by separate communities of practice. Information scholars have a unique opportunity to focus future research on bridging these divides, drawing on skillsets for managing heterogeneous datasets. We can look to successes in the archival field for developing strategies for preserving complex objects to develop similar plans for managing archaeological collections. Such future work will guide scholars and professionals towards collaborative management of archaeological materials for long-term preservation – ensuring both collections care and public display, and the continued ability to construct new knowledge of our shared heritage.

Appendix A.

List of Study Interviewees

Reference	Professional Role (research site)	Date interviewed (total site hours)
Lacey	Data Supervisor (1)	13 February, 8 June-3 July 2015 (180)
Leona	Trench Supervisor (1)	8 June-3 July 2015 (180)
Laurie	Trench Supervisor (1)	8 June-3 July 2015 (180)
London	Trench Supervisor (1)	30 June 2015 (180)
Lesley	Trench Supervisor (1)	30 June 2015 (180)
Lex	Trench Supervisor (1)	2 July 2015 (180)
Logan	Museum Supervisor (1)	8 June-3 July 2015 (180)
Nathan	Project Director (2)	21 April, 22 July 2015 (3)
Mario	Project Director (3)	8 April, 24 July (50)
Mason	Head Conservator (3)	8 April, 24 July, 12 November, 18 November 2015, 22 January 2016 (50)
Mabel	Registrar (3)	20 July 2015 (50)
Malcolm	Collections Manager (3)	23 July, 19-20 November 2015 (50)
Martina	Marine Archaeologist (3)	19-20 November 2015 (50)
Marvin	Conservator (3)	3 December 2015 (50)
Marcia	Chief Conservator (3)	3 December 2015 (50)
Margot	Curator (3)	4 December 2015 (50)
Manolo	Laboratory Director (3)	4 December 2015 (50)
Paris	Archivist (4)	28 February 2014 (30)
Paul	Head of Records / Archaeologist (4)	6 March 2014, 8 October 2015 (30)
Paz	Site Coordinator (4)	6 March 2014 (30)
Peggy	Head of Collections 1 (4)	6 March 2014 (30)
Paloma	Librarian (4)	10 April 2014 (30)
Phoebe	Head of Collections 2 (4)	6 October, 8 October 2015 (30)
Portia	Registrar (4)	6 October, 8 October 2015 (30)

Appendix B.
IRB Research Determination

OFFICE OF RESEARCH SUPPORT

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, Texas 78713 · Mail Code A3200
(512) 471-8871 · FAX (512) 471-8873

FWA # 00002030

Date: 05/20/15

PI: Patricia K Galloway

Dept: Information, School of

Title: Understanding Archaeological Curation Work

Re: IRB Exempt Determination for Protocol Number 2015-04-0094

Dear Patricia K Galloway:

Recognition of Exempt status based on 45 CFR 46.101(b)(2).

Qualifying Period: 05/20/2015 to 05/19/2018. *Expires 12 a.m. [midnight] of this date.*
A continuing review report must be submitted in three years if the research is ongoing.

Responsibilities of the Principal Investigator:

Research that is determined to be Exempt from Institutional Review Board (IRB) review is not exempt from ensuring protection of human subjects. The Principal Investigator (PI) is responsible for the following throughout the conduct of the research study:

1. Assuring that all investigators and co-principal investigators are trained in the ethical principles, relevant federal regulations, and institutional policies governing human subject research.

2. Disclosing to the subjects that the activities involve research and that participation is voluntary during the informed consent process.

3. Providing subjects with pertinent information (e.g., risks and benefits, contact information for investigators and ORS) and ensuring that human subjects will voluntarily consent to participate in the research when appropriate (e.g., surveys, interviews).

4. Assuring the subjects will be selected equitably, so that the risks and benefits of the research are justly distributed.

5. Assuring that the IRB will be immediately informed of any information or unanticipated problems that may increase the risk to the subjects and cause the category of review to be reclassified to expedited or full board review.

6. Assuring that the IRB will be immediately informed of any complaints from subjects regarding their risks and benefits.

7. Assuring that the privacy of the subjects and the confidentiality of the research data will be maintained appropriately to ensure minimal risks to subjects.

8. Reporting, by submission of an amendment request, any changes in the research study that alter the level of risk to subjects.

These criteria are specified in the PI Assurance Statement that was signed before determination of exempt status was granted. The PI' s signature acknowledges that they understand and accept these conditions. Refer to the Office of Research Support (ORS) website www.utexas.edu/irb for specific information on training, voluntary informed consent, privacy, and how to notify the IRB of unanticipated problems.

1. Closure: Upon completion of the research study, a Closure Report must be submitted to the ORS.

2. Unanticipated Problems: Any unanticipated problems or complaints must be reported to the IRB/ORS immediately. Further information concerning unanticipated problems can be found in the IRB Policies and Procedure Manual.

3. Continuing Review: A Continuing Review Report must be submitted if the study will continue beyond the three year qualifying period.

4. Amendments: Modifications that affect the exempt category or the criteria for exempt determination must be submitted as an amendment. Investigators are strongly encouraged to contact the IRB Program Coordinator(s) to describe any changes prior to submitting an amendment. The IRB Program Coordinator(s) can help investigators determine if a formal amendment is necessary or if the modification does not require a formal amendment process.

If you have any questions contact the ORS by phone at (512) 471-8871 or via e-mail at orsc@uts.cc.utexas.edu.

Sincerely,

James Wilson, Ph.D.
Institutional Review Board Chair

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