TOWARD A SMALL DATA ARCHAEOLOGY

Otomí, Aztec Imperial, and Spanish Colonial Xaltocan, Mexico

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Toward a "Small Data" Archaeology

Peopling the Past Through a Data-Intensive, Indigenous Feminist Household Archaeology

In 2009, I arrived in the Indigenous central Mexican town of Xaltocan, located directly on top of the ancient and historic archaeological site of Xaltocan in the northern Basin of Mexico in what was formerly a shallow, brackish lake with the same name (figure 1.1). I was a newly minted doctoral candidate and a settler colonial archaeologist, equipped with lots of grant money, scholarly ambition, and personal connections from previous field seasons working under my adviser. I was eager to get to work uncovering the material evidence that would allow me to reconstruct how everyday life in the ancient town about an hour north of present-day Mexico City had changed under Aztec imperialism—a classic anthropological question that I had updated with theories of agency and practice, aimed at restoring the bottom-up agency of its inhabitants. It took a long time for me to see how that initial research question reproduced the very decentering and disparaging of Xaltocan's history that began with Aztec imperial agents,[1]

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1   A brief note on terminology. The term *Aztec* was coined by naturalist Alexander von Humboldt in the nineteenth century, using the Nahuatl word *Aztlan*, the legendary place of origin for many central Mexican peoples (Barlow 1949). Scholars today use the

FIGURE 1.2. *The monument installed in Xaltocan's town plaza by the historical association "El Gran Señorío de Xaltocan."*

who passed the baton to Spanish colonial ones and then on to Mexican national-ist ones—none in a position to speak to marginalized Xaltocan. This decentering

term *Aztec* variably (see Berdan et al. 1996, 4), some to refer to the inhabitants of the imperial capital of Tenochtitlan-Tlatelolco specifically, others to the entire Basin of Mexico during the Postclassic, and some to all of central Mexico, including the surrounding highland valleys. Aztec is commonly used to refer to the imperial formation created by the alliance of Tenochtitlan, Texcoco, and Tlacopan. Since George C. Vaillant (1938), the term *Aztec* has been consistently used for typologies of decorated ceramics found in the Basin of Mexico throughout the entire Postclassic period, including several centuries before the formation of the Aztec Triple Alliance. Some scholars, such as ethnohistorian James Lockhart, avoid the term entirely and prefer the linguistic referent of Nahua, with its attending connotations of shared culture, although this excludes the Otomí (e.g., Xaltocan before its conquest), who shared material culture with the Mexica, and includes the Tlaxcalteca, who were politically independent and had their own polychrome tradition. Alfredo López Austin (2001, 68) criticizes the term for its vagueness: "'Aztec,' with its his-torical, ceramic, linguistic, cultural, ethnic, and political applications, invokes confusion when it is not precisely clear to whom it is referring." Perhaps even more problematic, those peoples typically referred to themselves using more specific ethnic labels, for ex-ample, the Mexica, that often corresponded to specific pre-imperial city-states; there is no Indigenous term for Postclassic central Mexican peoples, because those peoples did not think of themselves in unifying terms. In this book, I avoid using the term *Aztec* to refer to a cultural group, in this case "the Aztecs," though I do employ it to speak of the Triple Alliance and its rulers, as well as the ceramic typologies used in the region.

FIGURE 1.3. *Photograph from the project symposium on May 1, 2010, showing Don Luis González Sánchez, owner of the land being excavated, presenting his talk "We the Descendants."*

was precisely what members of the community involved in the local historical association were actively fighting to reverse, for example, with the construction of a glyphic monument in the town square in 2008 (figure 1.2).

Christopher T. Morehart (2012) has discussed in detail the monument and its role in local identity politics and the appropriation of archaeological knowledge. Briefly, the monument takes the famous Aztec calendar stone, a Mexica monolithic sculpture unearthed below Mexico City's *zocalo* in 1790, and substitutes local glyphs and locally significant calendar dates for imperial ones. Xaltocan's place glyph—spiders in the sand—sits at the center in lieu of the solar deity emphasized in Aztec imperial public ritual. The monument clearly works to counter the exercise of power outlined by local historian Omar Romero Navarrete (2007, 12, my translation): "The history of Xaltocan became the history of Tenochtitlan . . . and that noble history, Xaltocan's beautiful history, was erased and replaced by the Mexica and Tenochtitlan." The Xaltocan monument literally re-centers Xaltocan in historical narratives.

It took me years of living and closely collaborating with the community, working together on symposia (figure 1.3) and museum exhibits, and dwelling and mourning and celebrating with families to reorient my own research to do the same. After years of working closely with the Xaltocameca community, I realized that I was too concerned with big things, big ideas, big processes that were rarely conceived of as locally located. We as researchers had only come to what was now a small Indigenous town, economically peripheral and socially marginalized, because of its imperial history. We were drawn to it because it had been independent and relatively powerful, serving as the capital of the

Otomí city-state in the thirteenth and fourteenth centuries, only to be conquered by neighboring Azcapotzalco in 1395 and folded into the newly formed Aztec Empire in 1430 (Alva Ixtlilxóchitl 1975–1977; Anales de Cuauhtitlan 1992; Hicks 1994; Nazareo de Xaltocan 1940). That is not to say that Xaltocamecas (or Mecas, as they sometimes call themselves today for short) see their town as isolated, either today or in the past, but rather that they wish for their history to be centered rather than defined in terms of their conquest from without. I had somehow fallen victim to the urban bias I resisted in graduate seminars, when as a student from a rural Northern California town, I pushed back against my professors' discussions of the supposedly universal urban draw that resulted from all the opportunities cities provided.

Had I begun my doctoral work in recent years rather than in 2009, I might have used a "big data" and AI or deep learning framework to Aztec imperialism, if all the dissertation proposals I have been reviewing lately are any indication. As I discuss in this introduction, I see archaeology's current infatuation with big, digital data as engaging in similar decentering work. It fits what Donna Haraway (1988, 581) termed "the god trick of seeing everywhere from nowhere," the ultimate realization of masculinist, colonialist fantasies. This book offers an alternative approach rooted in data feminism (D'Ignazio and Klein 2020)—a view from somewhere, a view grounded in the particular within individual houses filled with sensing bodies at Xaltocan, thus reversing Western science's process of abstraction (Collins 1999, 278). This book argues that a big data epistemology ought to be balanced by depth instead of breadth and a deeply interpretive and contextual approach that is simultaneously deeply empirical. The necessary counterpart to big data does not mean little or weak data; rather, where big data archaeology zooms out, a "small data" archaeology zooms in and then expands out, analyzing and peopling individual household contexts while remaining historically contextualized and applying a similar concern for empirical robusticity and using multiple, complementary datasets.

To be clear, this one singular view from somewhere, aligned with the interests of one descendant community, is the beginning, not the end, of my proposed understanding of Postclassic and early Colonial central Mexico. The view from these particular households within Xaltocan is just that—one view. As my Xaltocameca collaborators would likely say, this book is my grain of sand, mi granito de arena. We need multiple views from multiple somewheres to comprehend the variability that certainly existed in lived experience, familial relationships, and social-economic practices—variability that is only visible when we have zoomed into the micro-scale of individual family members and individual households at particular historical moments. If our reconstructions of central Mexican heritage do not have thinking, sensing individuals with social identities and relationships, entangled with a world teeming with nonhuman

forces, and if they do not have variability in consumption relationships between this family and its neighbors or this social group and that within the town, we will have stripped the past of all of the complexity that makes human life so fascinating. I suggest that to do justice to these ancestors, we cannot gloss over this detail. Finally, as I will discuss, at Xaltocan a small data archaeology is a necessary complement in terms of ethical and decolonizing archaeological practice, since the hyper-local view is of most interest within the descendant community.

BIG DATA IN ARCHAEOLOGY

"Big data" is currently having a moment in the humanities and social sciences, creating what some are calling a "quantitative revolution." Originally inspired by the vast quantities of data collected in the new digital era, the approach was developed by scholars in the computer science and business fields. As Tim Cresswell (2014, 57) wryly remarks, "So-called 'soft' subjects are attempting to become more 'hard.' That, after all, is where the money goes." For the past decade, archaeologists have engaged in macro-scale, often comparative and interdisciplinary projects that incorporate high volumes and varieties of data that are analyzed by increasingly sophisticated software and algorithms (Cooper and Green 2016; Gattiglia 2015; Green 2023; Griffiths et al. 2024; VanValkenburgh and Dufton 2020; Wesson and Cottier 2014). Registries of archaeological data—such as the ARIADNE (Archaeological Research Infrastructure for Archaeological Data Networking in Europe) project that as of 2020 included two million searchable datasets—have been built to enable comparison (Niccolucci 2020). Statistical comparison of all available datasets on possibly related topics is carried out to facilitate predictive and probabilistic modeling. Data are aggregated and cross-referenced to get a larger-picture view, such as of deep historical depth or large spatial extent. Datasets are digitized, quantified, and geo-coded (Cresswell 2014, 57), and correlations between datasets are identified.

By using more and larger datasets, proponents argue, one can not only understand macro-level phenomena but also see overall patterns and "reach a level of granularity" not visible within individual sampled assemblages (Gattiglia 2015, 114). The application of machine learning and artificial intelligence to big datasets (often LiDAR-based) to automate the classification of features from remote sensing imagery (e.g., Davis et al. 2021) has the potential, according to proponents, to increase archaeological capacity beyond that of humans and "break a dependency on human resource" (Trier et al. 2018, 165). Kristian Kristiansen (2014) lists big data as one of the three recent developments underpinning what he calls a "third science revolution in archaeology."

Most concerns about the implementation of big data (e.g., Huggett 2020) pertain to digital gatekeeping and data access, whether projects are data-driven or hypothesis-driven, how to evaluate the quality of data and metadata, the

"black-boxing" of computational data tools, transparency about data cleaning and other necessary data manipulation, and other topics related to the general messiness and incomplete nature of archaeological data. Yet as Jerimy J. Cunningham and Scott MacEachern (2016, 4) contend, big data and other related approaches also "tend to dismiss the importance of on-the-ground complexities in their quest to generate grand, high-impact–factor syntheses. The degree to which such complexities are subsumable within attempts to generalize is of course highly variable. One of the particular challenges associated with big data, in archaeology and elsewhere in the social sciences, is that such approaches tend to move problem orientations from the study of causation to the discovery of correlation, in circumstances where entirely spurious correlations may easily be generated." Two aspects of this rich quote are worth highlighting for their relevance to this book: the overlooking of on-the-ground complexities to generalize on a larger geographic or trans-historical scale, and the goal of big stories of the kind often highlighted in *Nature* or *Science* and covered by popular media. Regarding the latter, Keith Kintigh and colleagues' (2014) "grand challenges" call to action is widely cited in the big data archaeology literature. Kintigh and colleagues (7–8) encourage archaeologists to consider "problems that have not previously been tackled due to a lack of evidence or the analytical or synthetic machinery to make the effort practical," further remarking that "to a nonspecialist there is a notable lack of concern with the earliest, the largest and otherwise unique." Moreover, Cunningham and MacEachern (2016), Eric Kansa (2016), Jeremy Huggett (2022), and others have associated big data with "fast science," in its quest for more data, faster speeds, and less human input; they have elaborated William Caraher's (2013, 2016) "slow archaeology" framework as an important antidote. The small data archaeology framework laid out in this book should be seen as allied with a slow archaeology.

Parker VanValkenburgh and J. Andrew Dufton (2020, S1) discuss other challenges presented by big data in archaeology, asking "how are our relationships with 'local' communities impacted by working at the scales of entire provinces, nation-states, and continents?" An Indigenous feminist perspective (Barnett 2015; Conkey 2005) offers a complementary critique. In my collaborative work with the Indigenous descendant community at Xaltocan—working with them to interpret the results of our excavations and disseminate them to the local community in the form of symposia and museum exhibits (Overholtzer 2015b; Overholtzer and Argueta 2018)—I have found that the kinds of reconstructions produced by big data archaeology are simply not of interest to most community members. The assessment of the systems approach that Janet Spector (1993, 3, 17) made more than three decades ago fits big data archaeology remarkably well: "The archaeology I was taught was objective, object oriented, and objectifying"; "like other taxonomic schemes, it generated distanced and lifeless representations of the

past." Objectifying and distanced reconstructions devoid of people simply do not engage most Xaltocan residents today; neither do archaeology's trans-historical "grand challenges" (Kintigh et al. 2014; see also important critique in Cobb 2014), the addressing of which dictates the need for modeling and synthetic data.

While levels of interest and perspective clearly vary within the descendant community with which I collaborate, as they do within any community, I have found that Xaltocamecas are overwhelmingly interested in the daily lives of their ancestors, conceived of as real, social people who were located precisely on the landscape they inhabit today. Some community members are more interested in known historical individuals, such as famous political leaders, which was visible in a list of Xaltocan's rulers painted on a wall in the community museum. Others are entirely uninterested in the past, and a few—though certainly not the majority and fewer than before—remain critical or suspicious of archaeological research entirely (see Brumfiel 2000). Nonetheless, I find that most residents and most of my collaborators are curious about their ancestors in general, in how they lived in the past, and in how their lives today are both similar to and different from those of their ancestors. In any case, the scale of interest is hyper-local, the opposite of much big data research that attempts to synthesize data across an enormous landscape. Sites such as Tonanitla—located just 3.5 kilometers away and clearly linked economically, politically, and socially to Xaltocan in the past—are of broad, general interest, but the view from there is not the same; it is not their history, and it is not considered "local." In this regard, I saw very little variability.

I suspect that this hyper-local interest might be the contemporary descendant of the "micropatriotism" described by James Lockhart (1992). For example, he recounts how the Indigenous chronicler Chimalpahin "tells of having seen some annals stored away concerning all Amaquemecan and having read and copied only the portion concerning his own Tzaqualtitlan Tenanco" (388). Similarly, Xaltocamecas want to tell the history of their ancestors, in that place. Just as Xaltocan's calendar stone community monument mentioned earlier re-centers Xaltocan, so does the deeply particularistic view from Xaltocan provided by this book. Yet just as historians today seek fruitful contrasts in the versions of history told by chroniclers from different polities, we would not want this book's view from Xaltocan to stand in for all of central Mexico between the Middle Postclassic and early Colonial periods. The archaeological record was not edited and rewritten in the same way as historical documents, so we might not have the same epistemological concerns regarding the consequences of micropatriotism for our evidence, but lived experience certainly varied between settlements. Just as the New Historians insist on reading Indigenous histories written in their languages, we too must seek something similar within our discipline in the form of views from specific communities. This book simply tries to provide a model, a first view.

From an ethical perspective, I think it is paramount that our research, in the words of Sonya Atalay (2006, 284), "is in sync with and contributes to the goals, aims, hopes, and curiosities of the communities whose past and heritage are under study, using methods and practices that are harmonious with their own worldviews, traditional knowledges, and lifeways." An extractive model in which Western scholars control study of Indigenous pasts and create reconstructions that are of no interest to descendants should not be the sole priority in twenty-first-century archaeology.

This is not to say that there is no room for academic theoretical concerns, no possibility for scholars to investigate questions of broader concern. Indeed, archaeologists will likely find familiar this book's attention to (1) the lived experience of people as social, feeling bodies in the world; (2) imperial and colonial contextual histories, albeit seen from another viewpoint; and (3) materialities and ontologies. Readers might also be surprised by chapter 3's focus on the study of ancestral human remains, given that the Indigenous peoples of North America with whom archaeologists have far more often collaborated are generally opposed to such study. In contrast, Xaltocan residents were eager to excavate, analyze, and display their ancestors' remains, because of their familiarity with them and because they attest to their heritage and their history in that place (Overholtzer and Argueta 2018). My collaborative work with Xaltocan residents has shown that all of these topics and methods are consistent with their own interests, perspectives, and understandings of their pasts.

Putting aside community concerns for a moment, from an academic perspective, big data epistemologies in archaeology can be seen to represent the continued realization of a masculinist, colonialist fantasy within our discipline. As Haraway (1988, 581–582) explained, it is no longer only the human eye that can see patterns and trends but the powerful computer: a new "instrument of visualization," with even less restricted and more infinite vision, creating "heroic feats of technoscientific production." This is, as Haraway reminds us, all an illusion. Big data, I would add, falls under what Dorothy E. Smith (1990, 4) called conceptual imperialism—dominant scholarly ideological practice that "alienates," "occludes," and "subdue[s] the lived actualities of people's experience to the discourses of ruling." Or in the words of Nancy Hartsock (1990, 161), it is "a way of looking at the world characteristic of the dominant white, male, Eurocentric ruling class, a way of dividing up the world that puts an omnipotent subject at the center and constructs marginal Others as sets of negative qualities." As archaeologist Christopher Begley (2016, 1) has argued, a focus on the visual and technologies such as LiDAR results in a decontextualization and "claims to an unsituated, objective understanding of the past." The "discoverer" thereby enabled allows the embodiment of hegemonic (i.e., dominance) and heteronormative (i.e., assumption of heterosexual, cisgender norms) fantasies,

Begley argues. So too, I argue, the aggregation of geospatial data over large geographic expanses that is so typical of big data in archaeology facilitates the perpetuation of the male gaze.

This book's position is that the "beams of lasers and scanning electron microscopes" that Haraway cites—commonly employed tools in our discipline today—do not dictate a more infinite and ever-expanding vision in archaeology. Scientific equipment and analytical methods do not demand that we ignore lived experience, emotion, and the personal. Many recent critiques of big data, the fetishization of data, and other topics (Sørensen 2017) have unfortunately relied on a now very tired schism between processual and postprocessual archaeology and between archaeology as science or theory, at least in part because some of its proponents used such a framing initially (e.g., Kristiansen 2014 speaks of a "silent collapse of the dominant post-processual framework"). Yet as I demonstrate in this book, neutrons bombarded at pieces of pottery, unstable chemical isotopes counted, complex statistical modeling, genes extracted and amplified can all be employed—subverted, even—to zoom in on and consider embodied and emotional individuals, social relationships, daily lived experiences, and radical historical specificity. They can be marshaled to reconstruct something of the people, practices, and places deemed of insufficient importance to be written about or to be written about poorly or inaccurately. And they can be employed reflexively in classic feminist fashion. I argue that such epistemological goals are essential checks to the masculinist, colonialist fantasies underlying big data approaches in archaeology.

DATA FEMINISM

Catherine D'Ignazio and Lauren Klein (2020) offer an alternative approach called data feminism, which uses data science to combat big data's tendency to reinforce existing inequalities. As they explain, "The hype around big data and AI is deafeningly male and white and techno-heroic and the time is now to reframe that world with a feminist lens" (9). They emphasize that big data modeling is often based on three flawed assumptions: that data form an unbiased input, that models are neutral, and that more data is always better. Data feminism teaches us that "before there are data, there are people"; data may be unrepresentative or may not be collected at all. They give the example of the algorithms Amazon created to screen initial job applications; because it was developed using the résumés of previous, predominantly male applicants, the model ranked résumés with gendered words and women's colleges lower. According to these scholars, the biggest threat from AI is not its growing intelligence or the prospect of a machine takeover but instead that it will "hard-code sexism, racism, and other forms of discrimination into the digital infrastructure of our societies" (29).

D'Ignazio and Klein (2020) outline three feminist approaches and seven principles for data feminism to follow. Projects may be feminist because they challenge power by *content*, that is, subject matter; by *form*, that is, different sensory and aesthetic communication registers; and by *process*, that is, by fomenting inclusive knowledge production (18). Data feminist principles include examining and challenging power, elevating embodiment and emotion, rethinking hierarchies and binaries, embracing pluralism, contemplating context, and rendering labor visible (17–18).

While not explicitly drawing on data science, the groundbreaking edited volume *Archaeologies of the Heart*, published in the same year as D'Ignazio and Klein's work, points the discipline of archaeology in a similar direction. Natasha Lyons and Kisha Supernant (2020) outline four key tenets of such an approach—rigor, care, relationality, and emotion—and in a holistic fashion highlight how our work, as a labor of love, can facilitate new ethically and empirically rigorous projects that facilitate relationships and research outcomes that are rewarding for all involved.

Archaeologies of the Heart had not yet been published when I was conducting my field research, but my own research relationships with the community led to something complementary to the heart-centered approach advocated by Lyons and Supernant (2020). With regard to rigor, I too was inspired by feminist standpoint theory (Harding 1995; see also Wylie 2013) and acknowledged the distinct knowledge held by the descendant community—highlighting, for example, their embodied experience of having lived in an adobe house—while also thinking reflexively of my own positionality and knowledge. With regard to care, I too brought caring labor, a labor of love, to my work and my engagement with the community. I am also well aware of how this book is now a different (and, I hope, better) one because the labor of its production was significantly slowed by the labor of birthing two children. Years ago, as a graduate student, I created the project that eventually led to this book because of a desire to direct my own field project so I could create a safe space for all participants, free from sexual harassment and discrimination, an idea Lyons and Supernant (2020, 8) link to an ethics of care. With regard to relationality, my engagement and relationship with the community similarly emphasized openness and responsibility. Finally, I felt validated and emboldened by their assertion that a heart-centered archaeology "can create spaces for the emotions of practitioners, stakeholders, and peoples of the past" (11).

Although I develop my own approach to data in archaeology, like data feminists D'Ignazio and Klein and archaeologists of the heart Lyons and Supernant, I draw on feminists such as Haraway, discussed above, and Patricia Hill Collins (1999). My small data archaeology follows Collins's suggestion that grounding our analysis in "the particular as a site of intersectionality"—in the concreteness

of lived experience—"reverses the process of abstraction so central to Western science" (278). The particular is of course situated, and so the historical and cultural contexts that structure oppression and domination, such as imperialism and colonialism in the case study at hand, are of relevance. The difference is the starting point: "An intersectional approach *grounded* in the particular starts with specific locations as points of origin" (278; original emphasis). As Margaret W. Conkey (2005, 32) reminds us, the archaeological record is composed of evidence of precisely these small-scale, quotidian practices. Attention to lived experience and personal narratives has been a feminist mainstay since the second-wave mantra "the personal is political." As archaeologist Kathleen Sterling (2015, 99), citing Beverly A. Bunch-Lyons (2000), explains, "the stories of individuals often contain broader truths about race and gender" and of course about class, geography, political economy, and more.

Feminism draws our attention to gender and inequity not only in the past but also in archaeological practice today, and here too there is something to be said about big data. An intersectional feminist critique leads us not only to implement the inclusive and collaborative forms of archaeology discussed earlier and the valuing of different ways of knowing, including embodied knowledge, but also to consider who within academia is carrying out the research and to what benefit. An intersectional perspective highlights how academic ideas are interconnected and are the products of broader social structures (Collins 1999). As D'Ignazio and Klein (2020, 9) remark, big data more broadly is dominated by white men, and, I would add, men from relatively homogeneous middle- to upper-class and urban backgrounds, perhaps even more so than within academia more broadly. As Tiffany Earley-Spadoni and Michael J. Harrower (2020, 182–183) point out regarding the senior scholars laying out the field's "grand challenges," it is evident that archaeologists championing big data archaeology "do not embody the diversity of backgrounds and perspectives represented by the broader field."

Feminist archaeologists such as Joan Gero (1985, 1994) have long pointed out a gendered division of labor within archaeological research that conforms to broader social norms for gendered behavior. Gero (1985, 344) explains how identical ideological constructs structure our explanations of the past and the roles we fill professionally: the stereotypical man-the-hunter is to the man-the-field archaeologist who "conquers the landscape, brings home the goodies, and takes his data raw" as the woman-the-gatherer is to the woman-at-home archaeologist who does the housework of analyzing archaeological materials, implementing typologies, and studying iconography. As Nancy M. White (1999, 14) explained: "It could be argued that the way women are traditionally socialized in our society makes them well suited for field and lab management, with better skills in scheduling, health and safety, and attention to tiny details of forms, tables, microflakes, or

palynology [the study of pollen grains or other spores] . . . Other studies have noted the female tendency to prefer/excel in perceived tedious tasks such as sorting lithic debitage, while males prefer analysis of big things thought to be more important, such as whole points, or concentration of their efforts upon fieldwork." Gero (1994) further highlights not just socialization but also sexist competency evaluation and gatekeeping in preventing women from conducting large-scale field research. The lab, however, might be perceived to be a place where women are safer from sexual misconduct and other abuse (Clancy et al. 2014; Meyers et al. 2018; Radde 2018; VanDerwarker et al. 2018) and to possibly provide flexible research timing that can more easily accommodate dependent care.

Regardless, these "big things" and "big projects" thought to be more important are precisely those that were more often funded by the National Science Foundation (NSF) and that bring their practitioners greater prestige (Gero 1985, 1994). There is an argument to be made about the preferential hiring by universities of individuals who will bring significant funding and field research opportunities. Today, major funding bodies such as the NSF and the National Institutes of Health have big data initiatives; one of the "10 Big Ideas" of the NSF is called "Harnessing the Data Revolution." As mentioned earlier, this point was made by Cresswell (2014, 57)—that big data is where the money goes.

In this regard, the small and big data archaeologies actually have quite a bit in common. Intensive household excavations, many radiocarbon dates, ancient DNA analysis, and instrumental neutron activation analysis—the particular combination of methods employed in this book—are not cheap. I have found that the money can be awarded not only to big data and other research oriented at "big questions" but also to what I am calling a "small data" archaeology. Small and big data have something else surprising in common: a maximization of the interpretive potential of archaeological materials or data collected in previous projects, albeit to a different end.

Gero (1994, 39) wrote about archaeology's excavation bias—that excavation is "real" archaeology—and the discipline's machismo attitude, aggressivity, risk taking, and goal of headline-news–worthy "discoveries." Gero argued critically that this attitude unethically resulted in the destruction of sites and the underutilization of data, especially since artifact analysis is not as highly valued as excavation. In addition, annual excavation projects may not be compatible with family life for women and BIPOC scholars, who tend to have greater care responsibilities, or for queer scholars for whom travel with family may be unsafe. An expectation of annual fieldwork may drive students away from those underrepresented categories and unwittingly hinder our equity goals for the discipline. A feminist perspective in which archaeological remains should be "milked for their fullest implications" (39) also aligns remarkably well with what members of the Indigenous descendant community at Xaltocan communicated with me

in our collaborative project. The archaeological record—their resource—is finite, and they were appalled that months of excavation and the destruction of entire contexts could result in just a few journal articles to be read by some academics. Inspired by my Indigenous collaborators to do more with what we had uncovered, no new archaeological excavations were carried out to provide more material for this book.

This book is the result of an attempt to "milk" the remains we excavated together—to keep analyzing them with new methods and keep asking new questions of them. The archaeological remains studied here initially formed the basis for my dissertation (Overholtzer 2012a) and twelve journal articles and book chapters published thereafter. Only some of the radiocarbon dates and ancient DNA results were included in that dissertation. Many of the artifact analyses of the materials that I conducted in 2009 and 2010, aimed at reconstructing household economies, did not make it into the dissertation, which had to be shortened and finished quickly after I was offered a tenure-track position at Wichita State University. They instead made their way into this book. After completing the PhD, I submitted additional radiocarbon samples, my collaborators continued their archaeogenetic analyses, and I submitted 332 ceramic samples from household middens for instrumental neutron activation analysis at the University of Missouri Research Reactor for this book project.

Finally, returning to a feminist approach in terms of *process*, I have published elsewhere on the Indigenous archaeology approach and inclusive, participatory methods I used at Xaltocan (Overholtzer 2015b; Overholtzer and Argueta 2018), but here I want to highlight two things I have learned. No matter how long or how intensively I collaborate with the Indigenous descendant community at Xaltocan, I remain a white, settler colonial archaeologist. My efforts to encourage the education of young Indigenous Xaltocameca archaeologists over more than a decade have failed. In Mexico, archaeology is a career that only relatively wealthy Mexicans can choose, because career prospects are dim and pay is low. Not many Xaltocan youth can attend a university, and if they can, they tend to choose better-paying careers like business and technology. While I have engaged in capacity building, worked closely with Xaltocan residents on interpretation and local dissemination in the form of symposia and museum exhibits, and prioritized their desired research outcomes over the publication of this book in terms of the order of completion, the descendant community has not been involved in the process of academic dissemination. As a consequence, their voices do not appear directly in this book, and this project thus is arguably far from the "genuine synergy" end of the collaborative spectrum described by Chip Colwell-Chanthaphonh and T. J. Ferguson (2008, 1–2). I remain conscious of and concerned about the risk of perpetuating colonialist practice by writing this single-author monograph, but I also wish, following Andrew Martindale

and Natasha Lyons (2014, 426) and Martindale and colleagues (2016, 197), to use what I have learned from my Indigenous collaborators to transform "orthodox archaeology."

Second, this collaborative process, as it has for many other academics, led me to the realization that we must incorporate Indigenous philosophies, ways of knowing, and ontologies into our reconstructions of their ancestors (but see Todd 2016 for an Indigenous critique of the ontological turn). In line with a broader ontological turn in the humanities and social sciences, scholars have recently begun to realize that our contemporary understandings of the roles of people, animals, and things in the world are ill-suited to the task of reconstructing pre-Hispanic life. I too remember being fascinated (and baffled) by the stories I was told in the excavation units and at the dinner table, like that of the *cincuate* (from *cintli*, Nahuatl for maize, and *coatl*, serpent), likely the Mexican pine snake, or *Pituophis deppei*, endemic to the state of Mexico. The *cincuate* is said to drink from lactating human mothers, distracting the baby with its tail so it does not cry and secreting a substance to make the mother sleep so it can nurse. Filled with milk, the *cincuate* then moves on, mother and child unharmed, according to Xaltocan residents (for variants of this story, see Castro 2001, 55; Madsen 1955). The snake in this story outwits the human, reversing the intentionality and agency historically assumed by North American settler colonial scholars.

Archaeologists now recognize the existence of alternate ontological frameworks wherein the world is composed of multiple, entangled lively or vital beings, entities, or forces—human and Other-than-human. As Sarah E. Baires (2017, ix) explains, archaeological "materials need to be examined not as static markers of broad-scale changes to cultural groups but as embodied players in vibrant past lives of people." And as Mary J. Weismantel (2013, 21) argues, pre-Columbian art objects were vital "interlocutors" in a social world and had an "active, working life" and a materiality that was just as important as their iconography. Within pre-Columbian archaeology, this theoretical turn has resulted in a complete reconceptualization of the role of such varied things as pots, sculptures, mortuary assemblages, and water (Alberti and Marshall 2009; Baltus and Baires 2017; Buchanan and Skousen 2015; Fowler 2013; Harrison-Buck and Hendon 2018; Joyce 2017; Overholtzer 2021a; Watts 2013; Weismantel 2018; Wilkinson 2013).

Eduardo Viveiros de Castro's (1998, 2004) work on Amazonian relational ontology, which he calls perspectivism, has been widely influential within the archaeology of the Americas. Nonetheless, as Weismantel (2015, 142) aptly argues, we must be careful to avoid Viveiros de Castro's "oddly timeless 'Amerindian world'" by attending to historical and material specificities. We must avoid uncritically applying Amerindian ontological concepts beyond the Amazon and avoid collapsing temporal and spatial variability by considering a singular

Indigenous ontology that stands in contrast to (and is superior to, in "a kind of 'animism good, Cartesianism bad' agenda" [Holbraad 2009, 435]) a Western ontological framework. And we must avoid the return to romantic primitivism present in his work, as Weismantel argues, which can be glossed as going to the ahistorical noble savages to learn from them. Alonso Zamora Corona (2020, 325) argues that the perspectivist model has been taken up far less often within Mesoamerica because of a "certain failure of accounting for material culture in a way that is meaningful and specific instead of being based on general analogies."

Zamora Corona (2020) also argues that ontology has been taken up less often by Mesoamericanists because Philippe Descola (2013) categorizes the Aztecs as "analogical"—a reality in which all beings, human and nonhuman, are animated but different from each other, just as there are differences between individual nonhumans. All of these atomized or fragmented entities are interrelated by analogies. Nonetheless, some Mesoamerican archaeologists have found utility in such ontological approaches (Dehouve 2020; Hendon 2018; Iwaniszewski 2017; Lucero 2018; Walton 2021), and some scholars have debated whether animism might not be a more appropriate classification (Chamoux 2011; Martínez González 2010; Millán et al. 2013).

From a metaphysics approach, James Maffie (2014) argues that the Aztec philosophy was monistic: as opposed to our contemporary dichotomies of nature/culture, inanimate/animate, nonhuman/human, the Aztecs saw the world as animated by one kind of "stuff"—a kind of divine energy called *teotl* that the Spanish poorly translated as god or deity. Entities were unstable, always in the process of assembling and reassembling, as were the vital relations between them. Following an Indigenous feminist approach, we must orient our archaeological interpretations of past peoples and things in central Mexico around this ontological framework, or we risk uncritically imposing our own modern Western understandings. This book therefore begins with an assumption of a more active role of the material world in everyday life, social identity, and economics than generally understood previously in Aztec archaeology.

In sum, data feminism in archaeology would, I suggest, redirect us away from a techno-heroic (i.e., technology as savior) big data approach and toward an analysis rooted in the particular and the local. It would redirect us away from modern Western ontological frameworks and toward Indigenous ones. Like big data, however, it would encourage the maximization of our limited archaeological record and the utilization of many diverse analyses and lines of evidence—and in cases like the community with which I work, many deeply quantitative, scientific methods, including ancient DNA and instrumental neutron activation analyses.

The approach put forward by this book is, like "slow archaeology," a necessary counter to big data archaeology. It is not a response to big data per se, as it has been coalescing independently and prior to the rise of big data. Rather, it is a complementary approach with fundamentally contrasting goals. Such a program might be termed a small data approach, which is small not for the amount of data collected (for the approach is equally concerned about empirical rigor) but for the scale of the archaeological and historical contexts examined. Where big data tends to zoom out, small data zooms in. In contrast to big data approaches in archaeology, which typically pull together data from many different contexts, context is key and contexts are small. A small data archaeology is the historically particular and contingent equivalent of the generally comparative big data. It promotes an on-the-ground, embodied understanding of the past, as opposed to a disembodied one from the air. It is, in this regard, the natural development of a feminist "peopled" and embodied approach (e.g., Meskell 1998; Robin 2001).

Rather than focus on macro-scale political and economic processes or the search for comparative universal explanations, this case study seeks to understand local history and lived experience as they are contextually situated, as requested by the Indigenous descendant community of Xaltocan. It also bridges the disciplinary chasm between archaeological theorists and archaeological scientists by applying geoarchaeological and molecular archaeology techniques to research questions derived from social theories of materiality, practice, and identity. Like the ethnoarchaeological "slow archaeology" promoted by Cunningham and MacEachern (2016), this approach takes time; it is also expensive.

A small data archaeology entails the very intensive study of single archaeological contexts, creating many complementary datasets using a suite of analytical methods to get the most detailed view possible. Here, I have been inspired not only by Janet Spector's criticism, mentioned earlier, but also by Rosemary Joyce (2001, 14), who writes that her work "has been based on the desire to produce an account of this past society more in line with ethnographically observed social realities": one filled with emotions, memory, and social relationships.

I illustrate the approach using a case study at Xaltocan, where a small number of individual households were fully excavated and the artifacts, ecofacts, human remains, and features were intensively studied using multiple lines of complementary evidence—including those drawn from molecular archaeology, geochemistry, and Bayesian statistics. Each set of human remains, for example, was radiocarbon dated and included in a Bayesian statistical model of the household chronology, which also includes all trash pits and select other relevant features. Familial relationships within the household were reconstructed using ancient DNA analysis of each individual. These families (or generations therein) may be tied chronologically to specific household trash contexts, and

analysis of their contents may be tied to consumption practices and social identity at a particular moment in history and a specific political-economic context. Household goods were analyzed as to their provenance using archaeometric methods, specifically neutron activation analysis of ceramics. The market consumption strategies and social networks of individual families were thereby reconstructed. The histories, social memories, and social identities of these households reconstructed archaeologically were also compared with colonial documentary sources to reveal disjunctures and, in some cases, the exercise of power in the past.

Together, these lines of evidence provide an incredibly fine-grained and comprehensive understanding of the history of these households, their social identities, the political-economic conditions under which their inhabitants lived, and the social networks they created and maintained through economic practices. This approach maximizes the insights provided by the finite archaeological record, producing more and more nuanced data with fewer destructive excavation units; thus, it can be appreciated for its ethical considerations. However, small data archaeology is not defined by these particular lines of evidence; ancient DNA analysis is powerful in the context of the Xaltocan case study, but another, different dataset might be more revelatory in another project. What is universal about a small data archaeology is the use of several complementary analytical tools to zoom in and intensively study individual archaeological contexts, with an eye to reconstructing local, historically specific lived experiences.

In peopling the past, a small data approach produces reconstructions and narratives that are more in line with the Indigenous philosophies of descendant communities. As Cunningham and MacEachern (2016, 4) suggest, "fast science"—here including big data and other related approaches—"is managerial, competitive, data-centric, technocratic and alienated from the societies it serves and studies." In contrast, the small data archaeology approach considers household members of differing ages, genders, classes, and social identities; their contemporaneity and relationships between them; and their specific political-economic context. It thus works against the "faceless blobs" that long characterized archaeological reconstructions, in the words of Ruth E. Tringham (1991, 94). It resurrects their agency, even and perhaps especially where their histories may have been silenced and rewritten by those in power. I have found narratives such as these to be the ideal meeting ground for academic and Indigenous epistemologies and the fulcrum of successful collaboration.

DECOLONIZING HISTORY AT XALTOCAN

One additional consequence of my collaborative work with the Indigenous descendant community of Xaltocan since 2009 deserves mention here, and it relates to the scale of history covered in this book. The classic Mesoamerican

chronological sequence—Formative, Classic, Postclassic, Colonial, and Republican—is a product of Western evolutionary thought: "a progression from 'primitive' hunter-gatherer society towards urban civilization, then interrupted by colonial conquest, but recovering with national independence and evolving towards a modern state, that is, moving forward to the industrial and capitalist economy" (Jansen and Pérez Jiménez 2017, 4). Following this sequence, the discipline of archaeology has long been arbitrarily divided between those specialists who study prehistory and those who study the more recent past. Edited volumes for the Americas rarely cover both periods; when they do, they place pre-Hispanic and Colonial periods in separate sections. Monographs almost never span the transition; if they do, it is mainly to see what changed with Spanish colonialism. That is, the pre-Hispanic past simply serves as a "before" and is not reconstructed on its own merits. Archaeological remains are divvied up between specialists and analyzed separately. The first field season in which I participated in excavations at Xaltocan, for example, was an NSF-funded project co-directed by my adviser, Elizabeth M. Brumfiel (2005c), who took intellectual ownership of the pre-Hispanic deposits and finds, and Enrique Rodríguez-Alegría (2016), who was responsible for the Colonial ones.

The project I initially proposed at Xaltocan was, in predictable and rather unimaginative fashion, focused entirely on the pre-Hispanic period. The goal was to understand the history of occupation and changes in the materiality of everyday life with the transition to the Aztec Empire. Then, in 2009 and 2010, when I conducted six months of excavations on and around two house mounds at the southeastern edge of the site, the archaeological record pushed back against my plans. It told me—through major architectural features and massive middens—that the families who dwelled on these mounds kept living there after the arrival of the Spanish. Indeed, aside from the category of burials, of which I found none interred in the early Colonial household spaces, many of the best-preserved archaeological contexts postdated the arrival of Europeans.

I was faced with a dilemma: Did I continue the story of these families past the period I was originally looking for, or did I hand the remains and data over to someone like Rodríguez-Alegría, who had been studying Colonial remains at Xaltocan for years? I would have to better familiarize myself with the entire corpus of archaeological and historical research on Colonial central Mexico, undoubtedly extending my doctoral program. My answer came from my conversations with Xaltocan residents. While they fully appreciated the effect of Spanish colonialism, even better than I did, they saw the town's history as one—theirs. Of course, the families had continued to live on those mounds after 1521. They had lived on this island continuously since their ancestors formed it out of lake muck a thousand years prior. Why should I end the story of these families because Europeans had arrived, especially considering that at this

location, far from the colonial metropole of Mexico City, Indigenous peoples had few daily interactions with Spaniards? After careful consideration, I decided that the history of these households was but one history, a history that deserved to be told in its entirety, in one place, by one scholar.

Although the community does not use the language of postcolonial theory, what residents have said to me did and does resonate with the concerns many archaeologists have articulated in recent years. Scholars have argued that the practice of dividing the pre-Hispanic and Colonial periods has the effect of defining native peoples using Western terms, denying their agency and histories in the colonial context, and framing their pre-conquest practices as ahistorical (Lightfoot 1995; Oland et al. 2012; Rubertone 1996, 2000; Scheiber and Mitchell 2010). Maxine Oland and colleagues (2012) assert that in order to decolonize archaeological research, we must write long-term Indigenous histories that include, but are not limited to, the colonial encounter. We must not define Indigenous peoples by the presence or absence of European settler colonists. We must not perpetuate the silencing of Indigenous peoples enacted by those in power—whether that be Europeans who destroyed pre-Hispanic books and supervised the rewriting of new histories or pre-Hispanic rulers and elites who also burned books and revised the history of conquered peoples (Overholtzer 2013).

This book therefore aims to make a contribution to the way we publish on the pre-Hispanic and Colonial periods in the Americas. It aims to fully reconstruct household life and the lived experiences of family members during both—not simply to use the pre-Hispanic period as precisely that, a "before" used to measure an "after." The book centers the household, the family, and the local and considers that which remains to attest to their entire histories. Following the material remains of household occupations at this edge of the island over time meant tracing a history from 1240 CE to the end of the sixteenth century and perhaps a few decades later, to no later than 1650 CE. Interestingly, this new periodization is similar to that found by ethnohistorian Benjamin Johnson (2018), who followed the history of *tlaxilacalli* (a ward of a subunit of the *altepetl*) organization in Texcoco in the eastern Basin of Mexico. He explains: "A disjunctive break is almost always marked between the Aztec and Spanish periods, for reasons self-evident from an imperial perspective. Local administration, however, retained its logic even as other institutions hemorrhaged . . . What emerges is an entire cycle of localized colonial administration—felt from the multitudinous periphery, not the mediating center. The cycle begins with the implementation of tlaxilacalli regimes around the Mesoamerican year One Flint (1272 CE) and continues through the redefinition of these local communities after the population rebound of the mid-17th century" (19).

These periodizations must be inferred, either by archaeological or historical lines of evidence or more likely a combination of both. For example, an

archaeological study of households in Xochimilco, in the southern Basin of Mexico, might anticipate the need for a periodization reaching later into the Colonial period, based on the findings of environmental historian Richard Conway (2021). He argues that Indigenous Nahua society prospered, both economically and socially, well into the eighteenth century. The Spanish drainage project, or desagüe, of the northern lakes to protect Mexico City from flooding did not affect the southern lakes; as a consequence, Xochimilco residents could continue to maintain and exploit the systems of canals that afforded *chinampa* agriculture and the transport of foodstuffs and artisan products to Mexico City markets. In sum, this book suggests that we should follow the households or other archaeological contexts, attuning our studies to their temporalities rather than imposing our own chronological categories.

LAYOUT OF THE BOOK

Xaltocan's history, the history of archaeological research at the site, and the history of the house mounds my team and I excavated in 2009 and 2010 are detailed in chapter 2. That chapter also summarizes some of the previously published findings on which this book builds. Chapter 3 provides a small data archaeology using analyses of burials and human remains. This chapter combines analysis of burials; osteological identification of age, sex, and musculoskeletal markers; radiocarbon dating of each burial; and ancient DNA analysis. It is the low-hanging fruit of this approach, so to speak, in providing an easy way to create a more peopled approach and get at social memory, family relations, and the lived experience of imperialism and colonialism. Once we have peopled the houses with agents who lived at particular historical moments, we can keep these ancestors in our mind as we interpret the things they made, bought, and left behind in their homes, in chapters 4–6.

Not all sites feature so many household burials or such exceptional ancient DNA preservation, and not all descendant communities want their ancestral remains excavated and studied, as does the community of Xaltocan. Thus, chapters 4–6 illustrate the small data approach further by turning to the things that enlivened household social-economic practices and networks, things that are ubiquitous in many domestic contexts. Many readers may therefore find the model provided in those chapters easier to adapt to their own disparate research contexts. The approach I take here does two key things. First, it analyzes artifacts at an individual contextual scale; that is, each chapter includes attention to the remains of things in specific household middens, with both diachronic comparisons across the history of a single house, rebuilt on the house mound called Structure 122 in Brumfiel's site survey (2005c), and synchronic comparisons across three early Colonial middens. Middens are common in a wide variety of archaeological contexts, so this analytical strategy should be broadly applicable.

Second, similar to the way chapter 3 used multiple analytical methods to create a detailed narrative of the people interred in household space, chapters 4–6 use multiple analytical methods of artifacts, especially ceramics, from within those middens. Ceramics are of course the most ubiquitous artifact in many archaeological contexts because of their durability, so this focus too is intended to provide a model that many scholars can implement. Instrumental neutron activation analysis (INAA) of sherds functions in a similar analytical role to that served by ancient DNA analysis in chapter 3 of the book.

Instrumental neutron activation analysis (INAA), a bulk chemical compositional analysis commonly used in ceramic provenance archaeological research, is the analytical workhorse for chapters 4–6. It is the common thread that weaves together the chapters on consumption (chapter 4), feasting (chapter 5), and cultural florescence (chapter 6). In terms of chronology, chapter 3 focuses entirely on the pre-Hispanic period, as this is when family members were interred under the patio; chapters 4 and 5 span the pre-Hispanic to early Colonial periods; and chapter 6 focuses exclusively on early Colonial period ceramic artisans. A conclusion (chapter 7) wraps things up and reflects on the use of household data for this small data archaeology case study.

Domestic contexts are perhaps the most obvious choice for a small data archaeology—indeed, that is where many Indigenous and feminist-inspired projects have historically been carried out—but I do not think the approach must be confined to household archaeology. Similarly, while this book (and Postclassic and early Colonial central Mexican archaeology in general) benefits from a rich historical corpus, scholars working in regions or time periods without similar sources might turn to other forms of knowledge. Oral histories are the most obvious for those collaborating with Indigenous descendant communities. As we all do, I used what I found and let go of those remains that were not preserved, for example, when I did not find the intact floors I hoped to use to explore variability in the spatial patterning of daily life and economic practice in the household. In short, I encourage scholars considering how to apply a small data approach to their own archaeological and historical context to think less about the particular materials or analytical methods employed in this case study and more about the scale of analysis and the many complementary lines of evidence that can be used to fruitfully reconstruct it.