Asyèt yo, Ollas, and Vasijas: situating pottery production in the circum-Caribbean through a technological perspective

Casale, S.

CHAPTER 6

Discussion and Conclusion

This final chapter reviews the theoretical and methodological framework used in the dissertation: technological analyses combined with the community of practice model to build a comprehensive body of knowledge regarding ancient socio-cultural organizations. Each chapter tackled specific archaeological questions regarding ceramic production and enhanced our broad understanding of past communities, their social networks and human-environment engagement.

In this section I will provide a critical assessment of the different approaches touched upon in each case study in the context of ceramic analysis and archaeological narratives. The driving research question posited in this is dissertation is the following:

How can archaeometric analysis of ceramic materials be combined with a chaîne opératoire and communities of practice model to more holistically investigate archaeological assemblages in the circum-Caribbean region?

The fine-grained results pertaining to Indigenous and Colonial social life gained with the approaches utilized in the dissertation are employed in a larger scale investigation in the Caribbean archipelago and central Nicaragua, namely to gain a solid understanding of the diffusion of technological behaviors and how networks of social practices were synchronically and diachronically established. I will conclude by discussing future works in the region, and how a community of practice theory would provide a suitable framework to enhance our understanding of the social organization in the circum-Caribbean region.

6.1. A technological perspective to ceramic analysis

This dissertation begins with a critical understanding of the role of material culture in shedding light on the social organization of the people living in the Greater Antilles and in Central Nicaragua during the precolonial, colonial and postcolonial periods. The research takes a technological approach to ceramic manufacture to discuss questions related to communities' boundedness and cultural relations. The social context within which potters learn and experience how to manufacture their craft is the focus of this research. The "communities of practice" theory, developed by Lave and Wenger (1991) and applied in several archaeological areas (Joyce, 2020; Joyce, Hendon and Lopiparo, 2015; Joyce & Hendon, 2000; Pauketat & Alt, 2005; Roddick, 2009, 2013, 2015; Roddick & Stahl Ann, eds. 2016) is considered as complementary to the technology providing the framework to build on and display the relationship between individuals, communities, and technological behaviors (Costin, 2008; Dietler & Herbich, 1998; Dobres, 1995, 2000; Dobres & Hoffman, 1994; Gosselain, 1998, 2000, 2018; Gosselain & Livingstone Smith, 2005; Hendon, 2006, 2015; Herbich, 1987; Manem, 2020; Roux, 2003, 2013, 2015, 2019; Stark, 1999; Stark, Bishop and Miksa, 2000; Stark, Bowser and Horne, 2008).

Technological behaviors, intended as the way-of-doing a practice, are considered as a social act that takes place in specific socio-cultural contexts as a result of a community's history, traditions and transmission of knowledge between generations of individuals

and between diverse groups. Through the performance of daily practices, in the material and non-material world, people expressed and experienced their sociality and sense of cultural space and time (Dobres, 2000; Dobres & Hoffman, 1994; Hendon, 2006, 2008; Lemonnier, 1993).

This model can be used for interpreting material culture in general, because it allows us to perceive the production of certain goods, not as the result of an entire group of people acting as a culture block, but rather as an expression of a restricted part of individuals of the group, such as only some specialized craft workers. These individuals might share their knowledge about crafting or be in contact with other craft workers of another group, establishing a network or a social connection with another settlement. This connection can be traced through the understanding of the shared way-of-doing an action, such as by assessing their technological behaviors. By looking at the material culture through this lens, we could perceive a group of people of the same settlement as multi- and interconnected layers of different networks of practices, for instance, crafting ceramics, clothes, flints, food, ornaments or beads. All these actions are not localized to the settlement itself, but they are embedded in the social environment and that can be expanded to other people in other communities on a network-based idea (Joyce, Hendon and Lopiparo, 2015).

Therefore, the use of a practice-oriented perspective is central to comprehend past communities, and pot-making can be seen as one of the daily tasks in which individuals living in a group were embedded and experienced in their material and non-material world. The four case studies presented in each chapter revealed a substantial, complex and articulate web of relationship between people, environment and materials, suggesting how the investigation of micro histories of communities' negotiation between the surrounding areas and their social space offer insights to answer broader questions of social organization and cultural boundaries on a regional scale (Hofman, Bright and Rodriguez Ramos, 2010).

A close view of the multiple ways in which potters may have interacted with the raw materials and applied their technological knowledge is presented and all together formed a new solid body of knowledge that shows the importance of technological analysis to clarify social networks in the Caribbean archipelago and Central Nicaragua, to substantially advance our understanding of the relationship between technology, people and culture.

6.1.1. Disentangling ceramic manufacturing practices

Ceramic manufacturing processes require the performance of several different actions, from the collection of clay raw materials, preparation of the clay pastes, fashioning the clay mass, adding a decoration and eventually firing. All those activities involve a constant engagement between several individuals and with the surrounding landscape.

In this dissertation I untangled the ceramic manufacturing process and different case studies showed how to tackle the universe of material and non-material variables that were involved in potters' technological behavior. Each chapter discussed the role of raw materials in the ceramic production, and applied an archaeometric approach involving geochemical analysis (pXRF, VP-SEM-EDS and ICP-OES) and petrographic observation by means of optical microscope to understand compositional and mineralogical patterns in the clay components and other added materials (e.g. temper, mineral inclusions, pigment materials) used by the potters. Macro and micro trace analysis by means of a stereomicroscope was employed to get deeper insights in the forming procedures.

The orientation of people around the surrounding environment for procuring raw materials were clarified in Chapter Two, while Chapter Three and Four revealed technological connections associated with population movement and social networks between communities living in the eastern part of Hispaniola, Puerto Rico and Vieques Islands. Chapter 5 provided a case study that showed how understanding the production process for standardized ceramic mass production can also contribute to shed light on the life of people in more recent times as the 18th and 19th century. The following sections critically assess each chapter and the methodology applied.

6.1.1.1. Human-environment interaction

How we can recognize and integrate the role of the environment into the archaeological narrative. Can we discuss the action of raw material procurement as being part of a community's knowledge and shared practice?

Chapter Two addresses these questions in the context of the construction of the biggest monumental site of Nicaragua, Aguas Buenas (cal. 400-1250 CE) by looking at the ceramic material production as an integrated part of a community's life history and embedded into a broader social and cultural space. Based on the results of a micro-regional survey (Casale et al., 2020; Donner, 2020), I examined in detail the location of clay outcrops in the region in relation to the distribution of materials cultures and archaeological sites.

This result provided a picture of human orientation in the environment, strategy for clay collections and new knowledge on the construction of the site. The area surrounding the monumental site revealed to be rich in clay outcrops that could provide material for ceramic manufacture. 44 clay samples were analyzed with pXRF, and the elemental composition was compared with 30 ceramic fragments highlighting the presence of a variety of sources that were confidentially used in the production of a part of the ceramic assemblage. Although those clay outcrops are not in the immediate vicinity of Aguas Buenas but are located between three and five km away, are the biggest in extension within the identified quarries in the Mayales Subbasin, and are situated near water sources, other archaeological sites (<2 km) with long-term habitational evidence, and

areas of intensive pre-Hispanic ceramic remains deposited on the surface. Therefore, this research revealed not only the use of several local clay outcrops within a restricted ceramic assemblage from one mound of the site but also the distance from the site is considered and the relationship with other natural resources, such as fresh water sources. These results yield important insights to shed light on human-environment interaction and on the role of Aguas Buenas as possible shared place between different communities from the Mayales Subbasin region and likely other areas, who built this monumental site as shared action.

Radiocarbon dates of the archaeological sites identified near the clay outcrops associated with the ceramic assemblage pointed to a later human occupation not contemporaneous to the construction of Aguas Buenas (Donner, 2020; Donner & Geurds, 2018). It is more likely that there was a continuity in the procurement practices across generations, and throughout centuries communities established themselves in areas where essential natural sources were available and known, such as clay outcrops and water streams. The selection of the largest outcrops in the area guarantees the continuity of the socially learnt activities and understanding of space and natural resources.

The application of chemical analysis (pXRF) integrated with petrographic observation designed a solid methodological approach to identify the origin of the ceramic materials retrieved in Aguas Buenas and to which places potters did go and did not go to collect their raw materials in the surrounding landscape. Next to that, results of the chemical analysis generated different separate regional compositional patterns of clays outcrops both for the Mayales Subbasin and Zapatera island. This formed the first geochemical reference database in Nicaragua that can be used for future investigations on other archaeological sites in the region. The first application of the reference database positively pointed out the presence of pottery that were not locally produced but most likely transported from other areas, such as the identified fragments from the Sulaco Valley in northeastern Honduras.

As a caveat, although pXRF analysis offers the potential for distinguishing elemental patterns within geological materials, it is important to stress that the interpretation of the data must be understood in the context of the analyzed materials. For instance, the effect of the grain size in ceramic fabrics must be considered. Coarse grained minerals may influence the result of analysis by being preeminent in contrast to finer mineral inclusions in the elemental composition of the fabric and misleading the geochemical data. To cope with this issue in Chapter Two, I took three analyses in different spots for each ceramic and clay sample. Only the average value within the three analyses was considered for further data elaboration. Moreover, the interpretation of the elemental data was integrated with detailed petrographic observations of the ceramic bodies that provide precise insights on the fabric structures and mineralogical origin.

In the context of provenance analysis and human-environment engagement, Chapter Three, Four and Five showed the importance of petrographic analysis for clarifying the origin of the clay components even when an extensive clay survey is not available as it was for Chapter Two. In Chapter Three the identification of the metamorphic rock grains (*e.g.,* amphibolite, marble and quartzite) and igneous rock inclusions contained within the ceramic fragments retrieved in El Frances facilitated the identification between locally produced and imported pottery. To a further extent, the mineral composition of some Early Ceramic Age (ECA) wares excavated in El Frances was linked to ECA wares from the archaeological site of Dorado in Puerto Rico and the site of La Entrada in the Dominican Republic. Our results indicate that the community of people that lived at El Frances experienced two separated ceramic productions, an initial phase during the ECA in which all the analyzed materials were imported or produced with imported clays most likely from Puerto Rico, and a second phase during the Late Ceramic Age characterized by a stronger connection with the environment that surrounded El Frances as shown by the presence of ceramic fabrics manufactured exclusively with raw clay materials linked to the typical metamorphism that occurred in the Samaná peninsula.

Chapter Four showed how the groups that inhabited the site of El Cabo for centuries were involved in a broader regional network of interaction as identified through the presence of both locally available raw materials (coralliferous and evaporites inclusions) and ceramic fabrics made from various and distant geological environments. The results in Chapter Five proved how all the *taches noires* samples retrieved in Haiti were associated with Ligurian reference fabrics due to presence of metamorphic inclusions (gneiss and amphibolite) that are related to the local Paleozoic crystalline basement and both the calcareous and siliceous microfossils typically connected with the Pliocene marine marls outcropping in the coastal hills near Albissola.

6.1.1.2. Forming techniques: clay paste preparation and fashioning practices

How can we identify manufacturing traditions, and how do we relate manufacturing traditions to cultural boundaries? Can we recognize intra-site and inter-site differences within ceramic manufacturing traditions? How do we understand the presence of locally produced versus non-locally produced pottery within an archaeological assemblage?

This dissertation considered ceramic forming techniques as a constructive means of analysis to explore questions related to large-scale cultural patterns. The issue lies in evaluating whether the Indigenous communities that lived in the Caribbean Archipelago during the Early and Late Ceramic Ages sharing similar technological behaviors for ceramic production as well as for other material cultures, such as beads, ornamental objects, and lithics (see Breukel, 2019; Guzzo Falci, 2020).

In the past decades the pre-Colonial Caribbean archipelago has been described as a highly interconnected area stretching from regional to pan-Caribbean scale, where the

sea became a highway instead of a geographical barrier for the movement of people, good and ideas (Boomert, 2000, 2007; Breukel, 2019; Cody, 1993; Curet & Hauser, eds. 2011; Hofman et al., 2014, 2019; Hofman & van Duijvenbode, 2011; Fitzpatrick 2015; Keegan and Hofman, 2017; Laffoon et al., 2014, 2015; Rodriguez Ramos, 2010; Rodríguez-Ramos & Pagán-Jiménez, 2006). Provenance analysis of ceramics (Ahlman et al., 2008; Conrad et al., 2008; Crock et al., 2008; Descantes et al., 2008; Fitzpatrick et al., 2008; Isendoorn, Hofman and Booden, 2008; Kracht et al., 2022; Pavia et al., 2013; Scott et al., 2018; Siegel et al., 2008) and lithics materials (Knaf et al., 2021, 2022), and isotopic studies of ornamental objects shaped from animal teeth (Laffoon et al., 2014, 2015) depict a well-connected world that experienced long-distance networks of exchange. Recent genetic studies based on a-DNA confirmed the high rate of connectivity between communities of Puerto Rico and Hispaniola together with a restricted population size (Fernandes et al., 2021). For instance, two relatives were found buried 75 km a part on the island of Hispaniola. It is likely that the movement of people or crafts occurred through networks of exchange of good, mobility of people such as inter-marriage, or other forms of interaction such as rituals. Gathering centers were pivotal to promote relationship between groups and maintain a steady and solid exchange of knowledge and practices.

The *chaîne opératoire* approach was promising to understand technological behavior and to contextualize it from a synchronically and diachronically perspective. However, besides the recent technological studies on beads and ornaments by Katarina Guzzo Falci (2020) at different sites in the Caribbean archipelago and on lithics by Tom Breukel (2019), technological analyses of crafts have been relatively limited in covering both the Greater and the Lesser Antilles (Curet, 1997; Hofman & Jacobs, 2001; Hofman & Jacobs, 2004; Knippenberg, 2007; Martinón-Torres et al., 2012; Rodriguez Ramos, 2010).

The study of forming techniques and their variability can be complemented with morpho-stylistic and provenance analysis to trace networks of interaction and to elucidate on past communities' socio-cultural organization. To build a classification of forming techniques, we must consider that forming procedures entail a palimpsest of several different technological options visible in the archaeological record that bring informative insights on potters' technological choices. A techno-petrographic study, which includes macroscopic and microscopic observation, focuses on recording different topographic and structural traces that are left on the surface and internal fabric of the ceramic body was presented in Chapter Three and Four for sites distributed within Hispaniola, Puerto Rico and Vieques Island. Chapter Three and Four, as already mentioned in the previous section on provenance analysis, provided results on the different aspects of the ceramic manufacturing process and they contextualized the results chronologically and geographically.

Chapter Three offers a detailed comparison of paste preparation techniques between ancient communities living in Hispaniola, Puerto Rico and Vieques island. Results

suggest that during the ECA, there was an intense exchange of ceramic materials and potters shared technological steps between those Caribbean islands. The research highlights how three different modalities of preparing the clay paste, techno-group A, B and C were synchronically and diachronically diffused. In particular, the ECA shows a shared behavior of producing very fine and homogeneous fabric (techno-group A and B) and characterized by morpho-stylistic features commonly known in literature as Cedrosan Saladoid ceramics. These techno-groups A and B were identified throughout the interpretation of the mineral components as locally produced for the sites in Puerto Rico (La Gallera, Dorado-42, Tecla and Hacienda Grande) and Vieques island (Sorcé) due to connections with the local underlying geology. Ceramics manufactured with a similar paste fabric and morphologies (Cedrosan Saladoid) were also found in the sites of El Frances and La Entrada in Hispaniola. Petrographic analysis, however, attested that for these two sites, the ceramics were not locally produced but most likely imported from Puerto Rico. During the LCA for the site of El Frances, the analysis of the pastes showed a technological change (techno-group C) with the preparation of very coarse ceramic fabrics and different morphologies. This technological change goes along with the use of local clay sources and potters started to engage more with the surrounding environment and the natural resources available in the Samaná peninsula. Moreover, a cross site analysis with other LCA sites in Hispaniola situated in the Central north (El Flaco and La Luperona) and in the east (El Cabo) highlights a similar preparation strategy for the paste (Casale et al., 2022 in Chapter Four; Ting et al., 2016).

The results suggest that during the ECA potters shared a technological practice for manufacturing paste within Puerto Rico and Vieques islands and to some extension, ceramics with a similar paste were also exported to Hispaniola. During the LCA, the site of El Frances experienced a change in production with a preference for coarser and heterogeneous bodies with local procurement practices. On the one hand, this evidence strengthens the hypothesis of a broad network of social ties at the regional scale related to ceramic production during the ECA. On the other hand, it revealed important insights on the settlement history of El Frances and how initially it was in close relationship with other communities in Puerto Rico, as it was demonstrated with the direct connection with the site of Dorado and how during the LCA the communities begun to engage deeper with the surrounding natural environment of Hispaniola.

Chapter Four integrated the microscopic observation with a macroscale approach that offered a fine-grained analysis of the entire ceramic manufacturing process for the site of El Cabo. In general, the preference is for a medium coarse fabric and poorly sorted paste. The composition of the clay components suggested several origins from locally available limestone/sedimentary environment to nonlocal intermediate volcanic and metamorphic geology. The bases were modelled from two balls of clay that were flattened and assembled superimposed. The bodies were manufactured with superimposed coils

alternately beveled and uniformed by pinching and percussion action. The internal and external faces were smoothed on wet clay and after drying were burnished. Following these results, the *chaîne operatories* evidences a continuity during the analyzed period (550-1200 CE) while other features changed over time such as the selection of clay outcrops and in particular shapes and decoration with the change from Ostionoid to Chicoid morphological traits. El Cabo showed a complex homogeneous assemblage (*sensu* Roux 2019) characterized by one major techno-group and the use of multiple clay sources. The results implied that the potters of El Cabo were most likely embedded in a broader regional network of interaction and production as shown by the variation in the clay used. However, the sharing of one major *chaîne opératoire* suggested that the communities in contact with El Cabo find their roots in a common ancestral social network. This novel data for ceramic production complements the existing knowledge for ornaments and greenstone artifacts (Guzzo Falci 2020 and Breukel 2019) adding data on the technological behavior of the groups that inhabited El Cabo and the communities that shared a network with them.

Chapters Three and Four displayed how assessing technological tradition gleans information on cultural lineages by understanding historical continuity or discontinuity in the way-of-doing a practice. The further identification of more technological traditions on a broader spatiotemporal context across the Caribbean can trace socially learned practices that characterized different communities and their activities and can complement morphological analysis to understand large-scale cultural patterns.

6.1.1.3. A technological approach to highly standardized ceramics

Were recipes changed when new workshops were opened, and replicas were made? Can we identify technological changes in the recipes of the glaze, decoration, and body through the years?

Chapter Five deals with highly standardized ceramic production and it shows how the methodology to address technological questions needs to be tailored according to the type of materials under analysis. The highly standardized process for the 18th century *taches noires* ware gives little room to recognize macroscopic variation in the forming process throughout time. Therefore, a different methodology from Chapter Four was applied and more attention was given to microscopical traits where changes in the use of raw materials could be identified. Three techniques were selected to answer questions relating to the production recipes for the body and the glaze. ICP-OES provided the bulk geochemical data for the ceramic body and identified compositional similarity between ceramic samples found in Haiti and Albissola, Italy. Results formed the first step to the creation of a reference collection of geochemical data for the *taches noires* wares. Future studies on more vessels from Albissola with precise chronological data will allow us to

glean a detailed understanding of the change in clay paste preparation through the entire duration of the production.

The use of petrography and VP-SEM-EDS provides an important observation of the technological steps that were characteristic of potters from Albissola and provided geochemical and mineralogical data to distinguish those wares from Spanish and French imitations. In particular, petrography, next to the already mentioned insights into the origin of the clay materials, identified the double firing practice through the poorly developed glaze-body interface. After the first firing of the vessel body, the decoration was applied and then a second firing was performed. VP-SEM-EDS displayed loose unmelted grains throughout the glaze that a further compositional analysis revealed to be manganese oxides, a technological marker of the potter from Albissola as recorded in the historical documents (Chabrol de Volvic 1824; Capelli et al., 2017). Next to that, VP-SEM-EDS provided compositional data of the ceramic bodies and for the glaze, which were compared with previous studies from the other workshops opened in Spain and France. Compositional data distinguished the samples excavated in Haiti from the Spanish and French imitations and confirmed their provenance as a production of Albissola.

6.2. Concluding remarks and future research direction

In order to conclude this chapter, I draw upon new avenues for future research in the circum-Caribbean region, building on the methodology employed in this dissertation. The goal is to provide grounds for future expansion on the current methodological approaches and insights gleaned in each specific case study.

6.2.1. Expanding knowledge of Aguas Buenas, building and experiencing a monumental site

Chapter Two demonstrated the effectiveness of a combined approach using petrographic and compositional analysis for answering provenance and technological questions relating to ceramic production. The initial knowledge gained on the construction of Aguas Buenas was limited to the findings from the only excavated mound. Aguas Buenas, however encompasses 371 mounds and was likely constructed over a period of 100 to 400 years (Auzina, 2018; Geurds & Terpstra, 2017). The Aguas Buenas site is surrounded by several other sites (agglomerations of mounds) with living evidence in the surrounding area (see Donner, 2019; Donner & Geurds, 2018). The expansion of archaeological analysis to other part of Aguas Buenas, such as different mounds and habitation areas supported with absolute dating would glean insights as to its construction and development, and the involvement of different communities in building such a monumental place. Natalia Donner (2020) in her PhD research carried out a detailed analysis of different technological traditions that were established within the communities that lived in the Rio Mayales region and also involved the excavation of six test pits in Aguas Buenas. She built

a new chronology for the area based on ceramic manufacturing traditions. Although our knowledge in the Rio Mayales region, including Aguas Buenas, substantially increased, a compositional analysis and comparison with other sites and with a refence collection of clay samples has still not been carried out. Furthermore, considering that within Chapter Two it was determined that there were spotted ceramic sherds that were most likely manufactured in the Sulaco Valley in Honduras, a regional investigation that would include the western part of Nicaragua, known as Greater Nicoya, the Pacific Coast and the northern part of the country extending to Honduras could provide a deeper understanding of the technological traditions that developed in each area and how communities living in Central Nicaragua were embedded in a broader context.

A pivotal step forward will be the creation of test bars of the clay samples that are collected (Casale et al., 2020) and fire them at difference temperature intervals, for instance, 550-600 °C, 750-800 °C, and 900 °C. The further preparation of thin section samples from these test bars would allow us to expand our knowledge by permitting a direct petrographic comparison between ceramic assemblages and fired clays. The use of X-ray diffraction could clarify particular mineralogical phases that formed due to different temperatures reached in the firing process and shed light on other technological aspects. Moreover, to advance on provenance studies, thin sections could be also a source of information for analysis with SEM-EDS. As it was shown in Chapter Five, SEM-EDS can analyse different areas or individual spots on a ceramic body, and allows us to select particular inclusions, such as grog, minerals, or rock fragments. The specific investigation of the composition of rock fragments (e.g., basalts and andesine) would further expand our geochemical knowledge on the geology of the area. Considering the notable presence of igneous rocks in Central Nicaragua, particular attention paid to understanding the variability in composition between the same typology of inclusions, such as basalt fragments, could provide strong evidence for referencing particular elemental compositions of rock fragments found in ceramic fabric to specific areas and clay outcrops.

6.2.2. Understanding mobility and communities in contact in the Caribbean Archipelago

In the context of the Caribbean archipelago in this dissertation I advanced knowledge on the ceramic production, exchange and understanding of technological behaviors between distant communities. Results in Chapter Three showed how the understanding of the technological process demonstrated high similarity in the ceramics and raw materials processing during the ECA between communities in Puerto Rico and Hispaniola and highlighted a discrepancy between this earlier period and with LCA productions in El Frances. The study of the manufacturing process for the LCA, described in Chapter Three and Four, evidences a technological change compared with the previous centuries

and raw materials processing, hand gestures and movements appeared to have been organized in a similar sequence for most of the pottery found in El Cabo.

Therefore, these two chapters lay the groundwork for beginning to expand our research framework, from a cluster of sites to a more regionally based study. The analyzed sites were defined as embedded in a system of similar operational sequences, likely representing one community of practice. Our aim now is to move outwards looking for disjuncture between networks of potters and their acquired technological behavior. A noteworthy direction would be to clarify the technological change that occurred between Early and Late Ceramic Ages, with the disappearance of Saladoid morpho-aesthetical and technological traits and the emergence of new ceramic series.

For several years, the Ceramic Age term was used to indicate the period between 700/600 BCE and 1500 CE that marked the beginning of the pottery productions introduced via Arawak-speaker from South America (Rouse, 1992). However, communities inhabited the islands for several millennia before the Ceramic Age starting from around 5000 BCE in the so-called Lithic and Archaic Age. More and more evidence demonstrates that pottery was present, even if in small quantities, also in material assemblages from Archaic sites dated *circa* 2000-1000 BCE in Cuba (e.g., El Nispero, Corinthia III), Hispaniola (e.g., El Curro, El Caimito, Musiépedro), Puerto Rico (e.g., Angostura, Coroso complex and Jobos) and Virgin Islands (Keegan and Hofman 2017, pp. 43-44 and reference therein). Preliminary technological analysis demonstrated how these ceramics show variability in aesthetical traits and diverge from more recent Saladoid manufacturing practices (Rodriguez Ramos 2010; Rodriguez Ramos et al. 2008; Veloz Maggiolo et al. 1976; Ulloa Hung and Valcárcel Rojas 2005; Keegan and Hofman 2017, pp. 45-46). A detailed cross-sites analysis of Archaic Age ceramics in the Greater Antilles would reveal important technological aspects that were shared between Archaic communities before the advent of Saladoid groups. Consequently, the interpretation of the identified *chaîne opératoires* of Archaic Age communities should be compared with Early and Late Ceramic Age cultural manifestations such as the identified operational sequence from El Cabo (Chapter Four) and extended to other contemporaneous sites. A comparative analysis could explain at a regional perspective the technological changes that occurred between ECA pottery (e.g., Saladoid and Huecoid) characterized by fine and homogenous bodies and LCA developments (e.g., Chicoid, Meillacoid) that evidenced coarser and heterogeneous bodies with different morphological aspects. A fine-grained analysis will clarify cultural connections, transmission of knowledge and "way-of-doing" between different cultural groups across centuries providing a diachronic perspective on pottery manufacturing. Technological choices could drive our understanding of the interaction between Archaic communities and newcomers of the so-called Ceramic Age.

Next to that, it is important to strengthen the collaboration with local communities and artisans to understand modern production practices, including the selection of

raw materials and forming procedures. The integration of past and modern practices is essential to clarify on how communities of potters learn crafting, and in term of cognitive association how they transmit knowledge and how they identify themselves within their practices. Results will provide clearer histories of embodied practices, shedding light on past and modern tendencies, and persistence in technological behaviors (e.g., Casale et al 2020; Hofman and Jacobs 2001, 2005; Jacobson, forthcoming).

6.2.3 A view from Saint Domingue: future directions in Historical Archaeology

Chapter Five had a twofold aim, on the one hand, to establish a methodology to understand highly standardized ceramic manufacturing processes, and on the other hand, to clarify new insights on the transitional period between the French colonial regime and the newborn Haitian Republic. Following the methodological approach, future studies as discussed at the end of the Chapter should focus on expanding the knowledge of material used in the Albissola productions in order to have a wider understanding of the material changes that occurred in the manufacturing process and that can be used as a chronological markers. The expansion of more ICP-OES data on ceramic fabrics will generate a useful reference collection of geochemical values that could be easily used for future comparison with other *taches noires* found in Haiti as well as in other regions of the Americas.

Looking at the second aspect touched in Chapter Five, the research focused on colonial materials, revealing aspects of colonial life such as material consumptions, selection of particular goods and how these goods changed after the Independence and the establishment of the Haitian Republic. I suggest that future works should consider more materials connected with enslaved populations and objects of their manufacture found in the surrounding of the plantation areas. An analysis on this material culture would elucidate the history of the people that were the crucial part of the colonial system and balance the current narrative that is mostly based on colonial documents (Kelly, 2013).

6.2.4. Final thoughts

The case studies included in this dissertation demonstrate the importance of using a technological approach to ceramic studies for addressing questions related to understanding the extension and organization of past communities' networks and cultural ties. The interpretation of variability and changes in several aspects of the production process from the procurement of the raw materials to the forming stage, are pivotal to complement morpho-stylistic analysis and in mapping the cultural dimensions in which past individuals were embedded. Archaeologists are furnished with a broad set of techniques to assess technological traits, however, the highly variability in materials and production processes does not allow us to establish a firm and reliable methodology

that can be employed regularly. The case studies presented are an example of how methodologies need to be tailored to the specific research questions and material encountered.

As a final note, in this dissertation I tried to provide new insights into circum-Caribbean history. I consider that a focus on micro-scale processes with a practice-oriented approach to material culture as it was applied to pottery benefits future research in the region. Stressing that the learning process and discussing technological aspects are crucial to enable a connection between archaeological materials and the present-day society. In fact, it should be remembered that the American continents have been dramatically impacted by European colonization. The European invasion, with the exploitation of the Indigenous peoples, the arrival of enslaved Africans, and later indentured Asians have dramatically changed the world. As new technologies and social practices developed throughout the Colonial and post-colonial period, unravelling and recognizing the multiplicities of identities and sociocultural behaviors of the original peoples of the Americas allows us to better understand their legacies in today's multi-cultural societies.

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