(Re)constructing Crafting Communities in the Gulf of Fonseca, Honduras: a *Chaîne Opératoire* Approach

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ABSTRACT: In many regards, the *chaîne opératoire* has greatly contributed to the study of ceramics. Since its incorporation within the analysis of archaeological artefacts, the *chaîne opératoire* analysis has developed into a method which provides an understanding of the artisan community within a settlement. Furthermore, it provides solid material evidence of past artisanship, both through the reconstruction of manufacturing processes and technological choices. This paper addresses how *chaîne opératoire* studies can contribute to the reconstruction of the social organisation of craft, by exploring networks of actions and communities of practice at two case studies from the Gulf of Fonseca, Honduras. The first case study explores the role of the *chaîne opératoire* in identifying modes of craft transmission, while the second reveals several communities of practice operating contemporaneously within the same site and sharing a market for similar products.

INTRODUCTION

In Central American archaeology, ceramic analysis has long been the main output of archaeological research, often playing a central part in the region's predominantly culture-historical archaeological narratives. These narratives have frequently speculated about the pre-colonial occupation of the Gulf of Fonseca (fig. 1). However, there have been few archaeological excavations in the region itself. Approaches have, thus far, struggled with addressing questions regarding the everyday life of people prior to colonisation: local cultures are too often treated as "cultures removed from space and time" (Wendrich 2016: 8). Therefore, this paper aims to offer insights about the people who lived in the Gulf of Fonseca regarding their traditions, the sociality of their technology and their crafting practices.

The models applied to archaeological evidence in Central America have started to transition beyond a cultural-historical approach. In recent decades, research in Lower Central American has been successful in using approaches rooted in practice theory. The community of practice approach has, for example, contributed to the understanding of a pan-regional economy away from diffusionist perspectives while informing on production practices (e.g. Dennett 2016; Joyce 2017). These approaches have started to become progressively more technological rather than purely stylistic, which has led to an improved understanding of regional dynamics.

This paper will address how *chaîne opératoire* studies can contribute to the reconstruction of the social organisation of craft production within settlements based on two case studies from the Gulf of Fonseca, Honduras. Viewed through the lens of communities of practice, the use of *chaîne opératoire* will lead to a partial reconstruction of the past organisation of craft and associated learning practices.

EXAMINING SOCIALITY THROUGH CRAFTING PRACTICES

Since their introduction, *chaîne opératoire* studies have proven successful in revealing the true social agency of craftspeople. Developments in the analysis of manufacturing processes show this to be not only a useful method of tracing

technological choices, but also for revealing the social processes and interactions embedded within technical systems (Dietler and Herbich 1998). The *chaîne opératoire* can also be used to distinguish social groups in the archaeological record (e.g. Dietler and Herbich 1998; Joyce 2012; Roux 2017; Stark 1998).

The *chaîne opératoire* methodology and conceptual framework, developed by Leroi-Gourhan (1943), first consisted of the examination of the sequence of technical actions in the production of material culture. Distancing itself from the solely descriptive account of the final product as an independent result rather than an entangled one (Dobres 1999), descriptions of *chaînes opératoires* reflect sections of technical processes which allow for an anthropological analysis of archaeological assemblages. As such, the objects analysed are considered as materialised expressions of social and cultural relations (Lemonnier 1993). This analysis has the potential to reveal the socio-cultural context in which a variety of objects were produced (Roux 2017). Moreover, it can show how relations and links are maintained through the transmission of technical knowledge and gestures within a social group (Roux 2017: 21).

In order to reflect the central role played by the sociality of craft and technology in a given society, it is also necessary to consider archaeological assemblages through the lens of communities of practice. The study of the operational sequences of objects is essential to identify these groups in archaeological assemblages. To recognise communities of practice, analyses need to transcend the appearance of the final product and identify the similarities in underlying procedures of manufacture.

Lave and Wenger (1991) first articulated the concept of communities of practice, developing it into a theoretical framework centred around the idea of situated learning in practices (Wenger 1998). The concept reflects common collective learning and technical traditions within a group of craft-practitioners. It also provides an insight into the permeability of local traditions and their openness to variation and innovation. Most importantly, communities of practice reflect the sociality of technology via networks of production and apprenticeship. As proposed by Dietler and Herbich (1998), communities of practice can also be understood in terms of the perpetuating of 'micro-styles' (Herbich 1987) linked to specific apprenticeship procedures.

Van der Leeuw (1993), along with Roddick and Stahl (2016), Roux (2016) and Wenger (1998), acknowledge the essential role of perceptual-motor and cognitive skills, as well as of mental images, in the crafting of objects. However, recognising the craft-practitioner's agency, this study additionally considers the choices the craftspeople make as central to production processes. These choices materialise in the *chaîne opératoire* of the manufacture of pottery, which links them to the conceptual aspects of crafting techniques (van der Leeuw 1993). Indeed, the conceptualisation of the final product plays a central part in planning the manufacture. However, the means of arriving at this final product are flexible and adaptable to the potters' own technological choices.

Finally, typologies area useful tool for defining standards and identifying different communities of practice. Through the comparison of the operational sequence of

pottery belonging to the same vessel type (i.e. conforming to a standard of general aesthetic appearance), it is possible to observe the variations and technological choices in the production of a conceptualised final product. These variations will help to delimit communities of practice producing the same ceramic types using different *chaînes opératoires* within a settlement or a region.

IDENTIFYING COMMUNITIES OF PRACTICE AND APPRENTICESHIP IN ASSEMBLAGES: CASE STUDIES

The case studies presented below focus on the construction of communities of practice in pre-colonial settlements of the Gulf of Fonseca. The case studies originate from the analysis of ceramic materials collected in surveys, test pits and excavations by French archaeologist Claude Baudez in 1964-1965 on the Pacific coast of Honduras bordering the Gulf of Fonseca. The main output of Baudez's work in the area has been to create a pottery typology (Baudez 1966; 1976), which the *chaîne opératoire* analysis aims to complement in order to inform on social practices and crafting traditions at the sites of La Danta (ninth to thirteenth century AD) and Monte Libano (third to eighth century AD; see fig. 1).

LA DANTA

The site of La Danta is situated 6km from the coast in the southern part of the plain of Choluteca, 2km south of the modern town of Monjaras. In pre-colonial times, the plain would have been traversed by the Choluteca River, which flooded seasonally, providing the area with rich alluvial soils. Low mounds are dispersed across an area of 7ha, and are organised in two main groups (Baudez n.d.).

The site occupation seems to date to the Amapala phase (fig. 1). Ceramic evidence, which was retrieved exclusively from the first group, seems to indicate that the site was inhabited twice between AD 950-1250 (Baudez n.d.). These brief successive occupations make for a unique palimpsest, that in turn facilitates a closer temporal resolution to study the social organisation of craft production.

This is particularly visible on pottery belonging to the Cacaulito type, dating from the first occupation. In fact, the site-specific existence of this type with textile impressions points to a localised and regionally isolated ceramic industry around La Danta. The vessel shape frequently associated with Cacaulito pottery is the globular bowl. These bowls seem to be made either using a combination of coiling and slapping, or mould-made by slapping the paste onto the exterior surface of another vessel.

While textile-imprinted ceramics are not uncommon in the region, they rarely occur in the forms found at La Danta, which are characterised by the use of fine paste and thin-walled ceramics, associated with either high burnishing or polishing on the unimprinted surface. Elsewhere, they are generally associated with larger, thick-walled vessels. In these other cases, they can then be identified among utilitarian wares that were constructed using the same method, i.e. by slapping the prepared clay on the outer surface of an inverted vessel where a cloth is used to ensure the wet paste does not attach to the other vessel and in this way creating textile impressions. Outside of La Danta, those traces are then generally smoothed with varying levels of care, depending on the function of the pot.

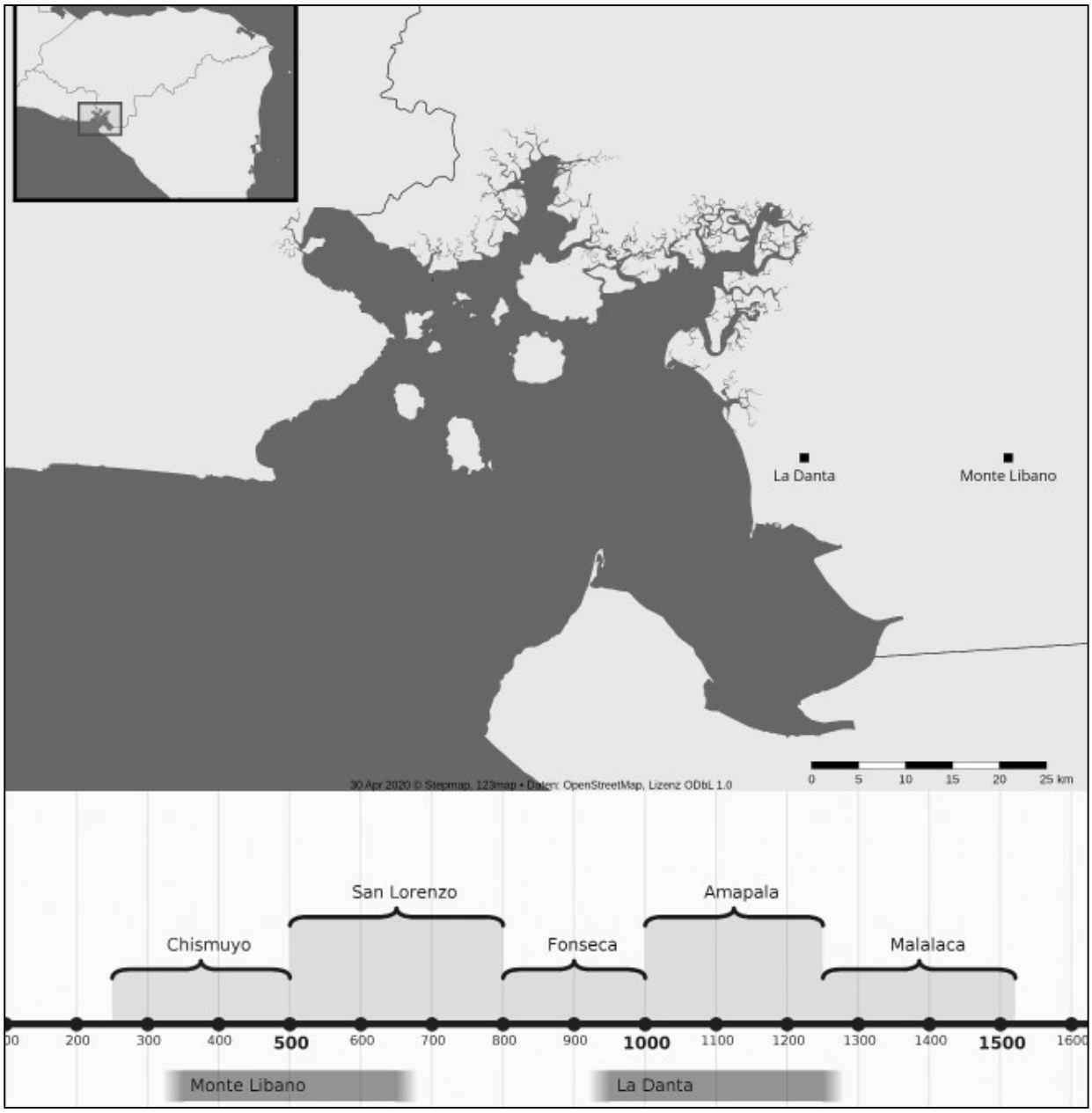

Figure 1: Location of the two case study sites and timeline of occupation of Monte Líbano and La Danta relative to the chronology of the Gulf of Fonseca.

Based on the *chaîne opératoire* of Cacaulito pottery, the following hypothesis is proposed: despite producing the same Cacaulito ceramics, several communities of practice were active at this site and were involved in different production networks. One seems to have produced fully oxidised vessels from very fine clay with textile impressions and burnished exteriors (fig. 2). Another variety of Cacaulito is a net imprinted, slightly coarser ceramic, fired in a reducing environment with an untreated exterior surface (fig. 3). While the final product is similar enough to be considered one type within the type-variety classification, it exhibits at least two distinct *chaînes opératoires* that indicate the presence of separate communities of practice.

Within the examined sample of Cacaulito sherds, it is furthermore possible to observe four different pastes—all associated with different types of weaves within the textile impressions. These weaves vary from medium thread with a loose weave to a very thin thread with a tight weave (fig. 4). A number of specimens exhibit a loose, irregular weave, while the net impressions exhibit a very regular threading and knotting (fig. 4), suggesting that a skilled artisan produced these nets. This range of variation observable within the weaving further indicates separate individuals producing different grades of cloth and nets.

This raises the question of the identity of the producers of the textiles and nets. If they were produced by the potters, or within the same household, the division between the postulated communities of practice is one that also occurs on a similar level to that of cloth production: one community would produce nets while the other one would have produced woven cloth. This implies that the production of Cacaulito ceramics would have involved the collaboration of individuals belonging to various communities but pertaining to a single social network. Cacaulito ceramics can therefore be considered 'boundary objects' (Cordell and Habicht-Mauche 2012), produced by overlapping communities of practice within 'constellations of practices' (Wenger 1998). Furthermore, the net impressions hint at the existence of a third community involved in this constellation, extending from subsistence strategies (such as fishing) into pottery. The articulation of these communities into constellations indicates an open network of activities within the site, which can subsequently be used to reconstruct the social narrative of craft organisation at La Danta.

Issues of communities of practice are inherently linked to the intra-site social organisation of craft and consumption. Both variations of the Cacaulito ceramics appear in the same context, which suggests that they were produced contemporaneously and consumed by the same families. The range of variation observed within Cacaulito ceramics in this context points towards a lack of standardisation imposed by the consumers. These communities of practice, therefore, did not compete when distributing their products. These observations suggest that several communities of practice at this location catered to a single community of consumption. The fact that two variations of this same type appeared contemporaneously may also indicate a permeable tradition, one that did not suppress innovation. This further hints at the absence of a controlling agent, as well as the decentralised structure of pottery production (Albero 2014: 255).

The observed interaction of crafts also provides insight into the specialisation of production. The heterogeneity of ceramic production practices at La Danta reflects a lack of specialisation within the craft (Clark 2007; Rice 1987). This argument is reinforced by the seeming openness of the network to the integration of different crafts and activities. A large skill-set can be observed, and the most skilled weaving is not necessarily associated with the highest skill of pottery production. This points towards crafts that are based on, and intersect, at a household level. Finally, the introduction of this new type of pottery may have been contemporaneous to the first settling of La Danta, and the brevity of this first occupation may not have allowed for the type to get established.

Figure 2: Examples of Cacaulito with textile impressions, inner and outer surfaces (photos by author).

Figure 3: Examples of Cacaulito with net impressions, inner and outer surface (photos by author).

Additionally, it is possible that at a site that was potentially both culturally and economically isolated from direct neighbours, the specialisation of craft and subsistence strategies may not have been as pronounced as elsewhere. The range of variability can in this case, provide insight into the socio-political aspect of pottery production present at La Danta.

MONTE LÍBANO

The site of Monte Líbano covers part of the southern alluvial plain of the department of Choluteca. It is located between a chain of low hills to the east and mangrove swamps to the west. The plain is traversed by narrow water-ways which feed into the estuaries of the Gulf of Fonseca. It has been suggested that the site, composed of 28 mounds, once spread over an area of 9ha.

The ceramics from Monte Líbano mostly come from the excavation of one mound. Its stratigraphy indicates a long occupation, interrupted by several flooding events. The first occupation layer can be dated to the Chismuyo phase, as early as AD 340. Later occupational layers indicate the use of the site well into the San Lorenzo phase, in the eighth century AD (Baudez n.d.). The

two first layers of occupation were used in this case study.

One ceramic type in particular, Auriga Café, merits further attention. This type represents over 50% of the assemblages in the two first occupation layers at this site. Contemporaneously, in the Chismuyo phase, it appears throughout the region at several sites. Auriga ceramics therefore offers another example of how communities of practice can be identified within an already established type.

Figure 4: Negative silicon casts of textile impressions (photos by author).

Figure 5: Examples of Auriga Café found at Monte Líbano, outer surface, profiles, and smoothing of the lip (photos by author).

The *chaîne opératoire* of pottery production remains similar throughout the region. The ceramic corpus generally consists of large diameter cooking pots (some examples were found in situ on hearths or used as urns), constructed with thick coils which are evened out and smoothed over. As is common throughout the region, the lip is constructed either by flattening a coil and folding it on itself or by applying a second coil to the outer side of the top coil. Auriga Café pottery has an undecorated body, with different inner and outer surface treatments.

Variations, which would have been dependent on each community of practice and their respective networks of craft knowledge transmission, are mainly identifiable in the steps of the *chaîne opératoire* involved in lip construction. All lips are decorated using displacement techniques. Regionally, the diagnostic lip decoration could be produced using finger impressions (as indicated by a clear fingerprint left on one specimen), by removing pieces of

clay, creating folds in the outer layer of the lip, or even by pinching (fig. 5), all of which create a similar final pattern. The local variety of the type at Monte Líbano is generally made using a coarse and pinkish-grey paste and has decorations made via clay removal combined with finger impressions (fig. 5). In contrast, Auriga samples from other sites in the region exhibit an iron-rich paste with the lip decoration made through folding. After these decorations were applied, the upper side of the folded coils was smoothed over on humid clay while the rest of the vessel was smoothed when leather-hard.

Regionally, pastes and firing varied along with the decorations to the lip. These vessels generally have medium to poorly sorted coarse pastes. The Auriga Café sherds that can be tied to Monte Líbano are all fired in an oxidising atmosphere, some show firing irregularities indicative of an open-air firing pit. Additionally, the paste recipe conforms to a certain standard that can be observed for all utilitarian ceramics from the Chismuyo phase at Monte Líbano. The preferred temper at this site—grog—can be observed even in certain local fine-pasted vessels.

Monte Líbano facilitates the examination of an often-overlooked element of communities of practice, namely apprenticeship. In the last decade, studies concerned with the learning of crafts have become more popular and have created an analytical framework within which social interactions based on craft production can be discussed (e.g. Crown 2001, 2014; Stark et al. 2008; Wendrich 2016). Different models of learning suggest different degrees of expert involvement in the teaching of craft. Potting, among domestic potters, is usually learned at a young age as a household task the child is expected to assist in. Generally, it is observed that inexperienced children are entrusted with the easiest tasks with the least risk of failure (Lave and Wenger 1991: 72). Identifying sherds made in the early stages of apprenticeship requires a knowledge of the elements within the *chaîne opératoire* that can fail as a consequence of a lack of knowledge or know-how. As a result, archaeologists analysing these objects must have an understanding of the standard product (i.e. the desired outcome) to be able to identify variations or outliers.

In this regard, one sherd from Monte Líbano raises several questions (fig. 6). This sherd coincides with the concept of the Auriga Café 'ideal'. However, the vessel is too small (less than 16cm in diameter) and overfired. The decoration on the lip also seems to have been created by pinching, a technique which has otherwise not been observed at this site. Wendrich (2016) theorised that smaller-sized vessels could have been made as practice pieces by children learning the potting craft. In this case, learning was likely peripheral at an early age and developed into participatory learning once the child grew older.

While the general appearance of the pot conforms to the aesthetic of Auriga Café, most of the *chaîne opératoire* does not, as the grog temper consists of large and poorly ground pieces which are poorly mixed within the clay matrix. The lip is neither folded nor doubled, and the body is modelled instead of coiled. Additionally, all surface treatments occured while the clay was still wet, which resulted in smudging instead of burnishing. Drying cracks can also be

Figure 5: Possible example of peripheral learning at Monte Libano. Outer surface, inner surface, profile, paste, sorting and traces of microcracks on the lip (photos by author).

observed on the lip, indicating either improper paste preparation or drying conditions. Furthermore, the size of the pinching marks indicates small fingers, which supports the theory that this is a practice piece made by a child. However, the clay conforms to the clay used in the other Auriga specimens from Monte Líbano.

These elements point towards learning through observation and imitation, with little involvement or supervision from a teacher. An adult did not rework the product to prevent failure and probably only contributed to the firing. However, the child seems to have had a previous understanding of certain elements of the *chaîne opératoire*, as well as a mental image of the desired product, as indicated by details such as the smearing of the top of the lip. It is therefore possible that the child was involved in certain aspects of pottery production, and was invited to

'step in' for simple tasks at various points throughout the operational sequence. Herewith, a snapshot of how apprenticeship was negotiated at Monte Líbano has been obtained.

These observations also provide insight into the sociality of craft at Monte Líbano. When combined, all these elements point toward the organisation of craft through nuclear families. However, it remains unclear whether potting families produced their own particular types of vessels or if several types would have been produced at the same location. Since several technological varieties of Auriga Café were found in the same context this would indicate that vessel production was not only geared towards meeting the needs of each household, but was most likely also produced in a part-time specialist capacity.

CRAFTING TRADITIONS AND COMMUNITY IN THE GULF OF FONSECA

Pure technological analyses have often found issues with arbitrary classification systems such as type-variety or modal analyses, in particular with their lack of interpretative potential. The case studies presented here illustrate how pre-existing type-variety classification can be a basis for social interpretations of material. Type-variety classification can be a good indicator of the mental image of the final product as it was desired by the potter.

It also provides an understanding of the degree of standardisation of a product and insight into the permeability of traditions to change as a result of innovation. By expanding the type-variety approach to encompass the technological approach, it is possible to identify the steps of the *chaîne opératoire* where variation occurs, therefore isolating the technological choices made by local potters. These technological choices, transferred by inter-generational craft transmission processes, can be considered 'social signatures' (Gosselain 2008: 77). As a result, these choices can be used to define communities of practice at the presented sites.

Through the analysis of the different steps of the *chaîne opératoire* it is possible to explore several dimensions of communities of practice in the Gulf of Fonseca. The study of communities of practice does not only involve the identification of separate technological traditions within the same ceramic type, but also revolves around the understanding of apprenticeship and how these communities functioned within a network of crafts.

At Monte Líbano, this analysis provided a base from which a model of apprenticeship could be outlined. In this case study, it was possible to extrapolate multiple stages of learning, transitioning from pure observation and imitation in peripheral learning to more 'hands on' participatory learning. In return, this also provides insight into the organisation of households in household-based crafts and the involvement of young family members in pottery manufacture.

At La Danta, this study evidenced a different dimension of communities of practice: the interaction between crafts. This overlap in communities of practice materialises in the object, thereby becoming a 'boundary object', and the craftsperson, who becomes a 'broker' between two different communities of practice (see Cordell and Habicht-Mauche 2012). In this case, the artisan is a 'broker' between weaving and

potting communities. This articulation between communities of practice can be understood as a constellation of practices, articulated by several brokers. Indeed, crafts are rarely produced in social isolation, and often activate social networks across multiple scales simultaneously.

CONCLUSION

Since its inception, the applications of the *chaîne opératoire* have become increasingly diverse. Previously criticised for being a rigid descriptive system exclusively focused on technology, it has now evolved as a means for exploring past people's lives and social interactions through practices. In this paper, in addition to demonstrating elements of the sociality of craft in the past, the integrated *chaîne opératoire* approach helps to address the question of tradition in the Gulf of Fonseca from an individual-focused point of view.

Refocusing the archaeological narrative in the Gulf of Fonseca around people and practices produces a better understanding of the working of pre-colonial society in the region, and of the social ties that maintained it. With the revision of materials through the lens of social practice theory, this study contributes to the development of an updated, and more dynamic, archaeological narrative.

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