Ancient Tagalog Goldworking Technology from Fray San Buenaventura's *Vocabulario de Lengua Tagala*: Integrating Archaeological, Linguistic, and Ethnohistoric Data

Victor Estrella[1]

Abstract

The purpose of this paper is to reconstruct the methods in the goldworking technology of the Tagalog community based on Fray San Buenaventura's Vocabulario de Lengua Tagala published in 1613. The study examines the processes and technical knowledge involved in raw materials procurement, reduction sequences, actual object production, and discard.

The study attempts to present a linguistic account as an aspect of an ethnohistorical study of the ancient Tagalog goldworking tradition. The linguistic account on goldworking processes, techniques, and products could be employed as a possible source for material patterning in the archaeological record, and in analysing ancient gold works and other related artefacts.

Introduction: Gold of the Tagalogs

Fray Pedro Chirino remarked, roughly four centuries ago on the stunningly huge amount of gold objects possessed by the native inhabitants of the Philippine archipelago. Upon the arrival of the Society of Jesus, sometime between 1581 and 1595, the members, especially Chirino, were keen in observing such native possessions and practices.

[1]Graduate Student, University of the Philippines - Archaeological Studies Program
Email: estrella_vic@yahoo.com

The account was written between 1595 and 1602 by Pedro Chirino, the priest tasked to record the history of the Jesuit missions in the Philippine islands. The whole account was published shortly in 1604 in Rome. Joan-Pau Rubiés (2003:419) suggests that Chirino's *Relación de las islas Filipinas,* well-groomed in classical learning, is an example of a "literature of colonial encounter" which is characterised by descriptive and practical genres. In this work, Chirino noted his observations regarding the ancient lifeways of the Tagalogs (Figure 1). He mentioned the abundance of gold ore and placer mines, but like Morga (1609) and Legazpi (1569), he was perplexed with the small amount of gold the natives procured.

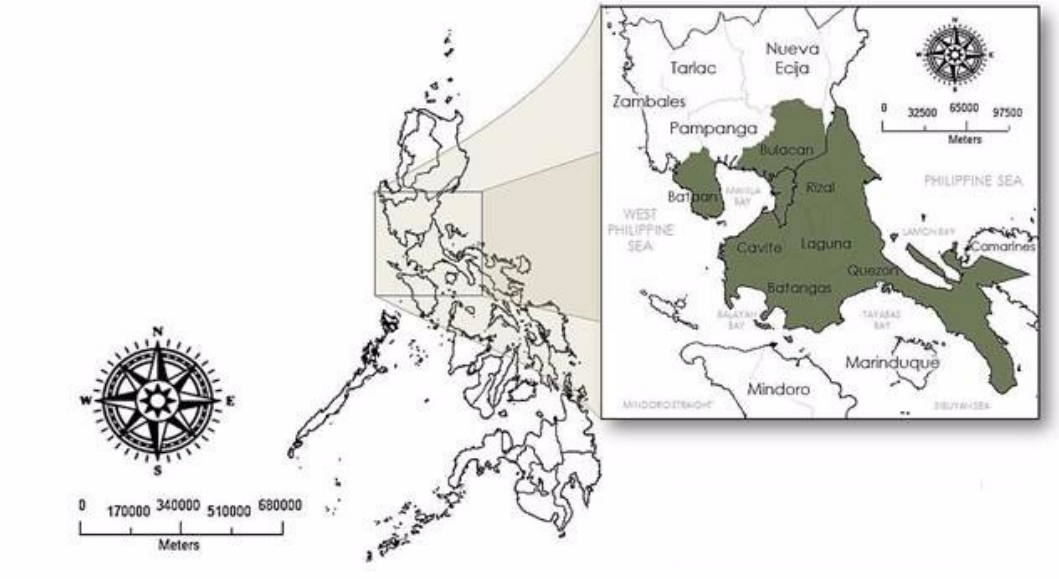

Figure 1: Map of the Philippines showing the current Tagalog region.

In another literature, written by another Jesuit, Fray Francisco Colin said that the gold from these mines was mostly transformed to personal adornments (Figure 2). Such ornaments included "various kinds of necklaces, and chains; bracelets or wristlets, also of gold and ivory, on the arms as high as the elbow…the fingers of the hand are covered with many rings of gold and precious stones" (Colin 1663:98-99).

Figure 2: Tagalogs (*Naturales*) wearing gold ornaments as illustrated in the Boxer Manuscript of 1595. © Lily Library of the Indiana University (http://www.indiana.edu/~liblilly/digital/collections/items/show/93).

Both Chirino and Colin, who unintentionally contributed to the seventeenth-century's antiquarian comparative history of ancient and gentile religions (Rubiés 2003), interacted with the Tagalogs from time to time and had noted some of the 'curious' practices of the natives. They narrated that the natives "placed gold in the mouths of the corpses, and laid with them many articles of value; and thus they buried them, under the house, richly adorned, and with the corpse another chest, containing garments" (Chirino 1604:170; Colin 1663).

The inhabitants' knowledge of gold was among the things first noticed by the Spanish chroniclers. In fact, Chirino (1604:310) observed that, "they not only make no mistake in the bargaining, but if it be necessary to weigh the gold or silver for the price they do it with such accuracy that the hand never trembles, nor is there any error in the weight". De Plasencia (1589), one of the first missionaries of the Franciscan order who came to the Philippine archipelago, confirmed the existence of goldsmiths. De Plasencia, since 1577, wrote about all aspects of the population's beliefs and culture, suggesting that within the Tagalog social organisation, people proved and emerged their worthiness as members of the community and gold was used to legitimise their claims. Ethnohistoric accounts cited above, therefore suggest that gold ornaments

were an important object in the lives of the Tagalogs. After all, Colin (1663:125) asserts that "after gold, no property was held in greater esteem".

The ethnohistoric accounts cannot emphasise enough the presence and use of gold ornaments in the Tagalog region in the past. This leads us to look further into the available archaeological data in order to know more about the past population's use and manufacture.

Archaeological Gold in the Tagalog Region

Unfortunately, the Tagalogs' mastery of manufacture and use of gold had left us with little archaeological evidence (Harrisson 1968). What are left, and are available to answer questions, are a couple of recovered gold jewellery artefacts (Beyer 1947; Beyer and de Veyra 1947; Fox 1959; Scott 1984; Solheim 2002) (Figure 3).

Figure 3: (a) a gold earring found in Novaliches © Beyer and de Veyra 1947:35; (b) three two-tiered solid gold "coat-fasteners" from inside a buried jar in Manila © Harrisson 1968:Plate VIII (c) massive gold ring, 30 mm in diameter from San Juan © Harrisson 1968:Plate IX and Locsin and Locsin 1967; (d) neck ornament made of gold wire found in San Juan Hill, outside Manila, dated 10th-13th century (© Capistrano-Baker *et al.* 2011:97, Figure 1.90).

Among the earliest gold artefact recovered within the Tagalog region is an earring found in a burial site in Novaliches. Though quite roughly done, it resembles an Ifugao 19th-century ornament (Beyer and de Veyra 1947; Scott 1984). It is associated with the Novaliches Pottery Complex dated between 400 BCE and 250 CE (Solheim 2002).

In Calatagan, Batangas, Robert Fox (1959) excavated several gold objects believed to be from the 15th to 16th centuries AD. From the Pulung Bakaw and Karitunan sites, gold rings were recovered together with some gold beads, while in the Talisay site, a gold leaf was found covering the right eye socket of the deceased (Chang 2008; Fox 1967). Based on the based on Fox's analysis of the bones, the gold items were associated with children, suggesting a case of burial goods for non-adult burials during this period in the Tagalog region (Barretto-Tesoro 2008; Chang 2008; Fox 1959, 1967).

Beyer (1947) mentioned an old Manila gold work assemblage composed of items ranging from bead necklaces, earrings, finger-rings, brooches, and hair ornaments, collected from 1919 to 1923 by a Mrs. McCrory and Mrs. Hazel Clark Taylor. This collection, which was attributed by Beyer to the Rizal-Bulacan Archaeological Survey, was feared to be destroyed or looted during the Second World War. Manila. Beyer (1947:231) recalls that the assemblage was "pre-Spanish and early Spanish in origin".

Today, the Locsin Collection takes care of a handful of similar gold artefacts (Capistrano-Baker 2013). Among the assemblage, pieces range from simple earrings to complex goldworks. Harrisson (1968:78) examined the two-tiered "coat-fasteners", which are solid gold pieces found inside a jar in San Juan with each having a wide slit right down one side. He also examined a a massive gold ring. Harrisson (1968) was interested in these pieces since they have similarities with those recovered from West Borneo and could be used to establish links between past cultures in the region. He noted that the rest of the pieces in the assemblage were quite unique. Harrisson (1968:79) stated that the Philippine gold artefacts could had been products of "more fluid, and vigorous goldworking" that clearly exhibited "local dynamics".

In a more recent study done by Miksic (2011 and 2013), he compares Philippine gold objects, including some items from the Tagalog areas, with those from Southeast Asia. The study's findings suggest that from a single stylistic unity that occurred about 2000 years ago, the

Philippine gold works evolved into "non-classical" forms, agreeing with Harrisson's earlier remarks (Miksic 2011; 2013).

Some archaeological and anthropological literature on gold' social contexts in terms of its use and distribution in the past are discussed below. Most of these research document the gold-producing societies of the Cordilleras. However, it is important to note their link with the Tagalog gold-using and gold-manufacturing population as we shall review them in the following paragraphs.

Caballero (1992; 1996) worked on traditional small-scale gold mining technology of the extant population in Benguet, Northern Philippines. Caballero (1996) claims that such technology enabled and created a social niche for the general population in the area because of the gold's relative abundance and the specific technological requirements of procuring it, the society developed into a specialised type. In addition, Caballero was able to review a wide anthropological and historical literature, synthesising a periodisation for gold mining and perhaps gold working in the Philippines. This four periods are the (1) Pre-Chinese and (2) Chinese Period (400 BCE to 1500 CE), (3) Spanish Period (1500s to 1898), and the American Period (1941 to 1898).

Canilao (2008; 2009; 2010 2011a; 2011b; 2013a; 2015) suggests further that this Cordillera gold was a source for many of the neighbouring cultures, including the Tagalogs. He describes the process of procuring gold from nature and transforming it from raw materials to functional forms. In particular, Canilao (2013a) recounts the processes involved in procuring raw gold from the highlands of Cordillera in an attempt to provide a context for the gold mentioned in the Laguna Copperplate Inscription.

More importantly, he put forward the idea that gold mining activity was the most feasible driving force in the early settling of the lands by the Ibaloi population in the Cordillera. Also, this activity brought about an important economic link between the Ibaloi and its neighbouring lowland coastal communities of Ilocos, Pangasinan and the Tagalog region, and even as far as communities in Vietnam and China (Canilao 2011a; 2013a).

Villegas' (1999; 2004; 2013) knowledge of the gold working industries in Bulacan and Batangas made it possible to document the different gold-working processes and techniques, in addition to his

analyses of the Bangko Sentral ng Pilipinas' gold collection. Villegas (1999) observed that Philippine goldwork is characterised by its multiplicity of parts and segmentary nature, allowing for goldsmith's eccentricity and individual expression.

A similar work was done by Esguerra (2013), who observed and interviewed practicing goldsmiths in Meycauayan in Bulacan between 2009 and 2012. He noted the gold-working techniques employed by present-day jewellers that provided technical context to the gold items displayed at the Ayala Museum (Capistrano-Baker 2013; Capistrano-Baker *et al.* 2011). Based on his study, he (Esguerra 2013:92-93) argues that "science and technology have enhanced traditional gold working techniques, but the basic methods remain the same".

Analogy from Ethnoarchaeology

Providing a socio-technological context as to how the gold objects presented earlier could had been made therefore requires a framework and approach that utilise every available source. In this case, ethnoarchaeology suggests a tool –analogy.

In brief, ethnoarchaeology, as a methodological approach considers detailed parallelism between the known forms of social organisation and the material culture being studied. In trying to establish ethnographic parallels for an archaeological inquiry on the ancient Tagalog gold-working technology and tradition, the scanty material culture recovered systematically are juxtaposed with the accounts from ethnohistoric records of the late 16th and early 17th centuries and with contemporary literatures. The objective is to suggest persistence, if not a continuity, of certain aspects of this technology in the past. Therefore, considerations on goldworking could be used to provide context of gold objects in the archaeological record.

It should be noted also that the concept of ethnoarchaeology was used in the paper in its broadest sense. In fact, it was neither the approach nor the methodology, but its use of analogy is considered to be a worthwhile attempt. This study views ethnoarchaeology as "the use of ethnographic methods and information to aid in the interpretation and explanation of archaeological data" (Stiles 1977:88). Data obtained from ethnoarchaeological approach, in analysing aspects of a more recent society, are believed to be useful in providing explanation for material

remains of another past society. Kramer (1979:1) further suggests that the approach is an "investigation of aspects of contemporary socio-cultural behaviour from an archaeological perspective". This is all in an attempt to discern possible relationships between behaviour and material culture, in addition to identify how material patterning reflects observable behaviour (Kramer 1979:1). Ultimately, Gould (1974) differentiates ethnoarchaeology from living archaeology. Living archaeology, according to him, is the actual immersion of a scholar to a contemporary human society, wherein one conducts fieldworks with the aim to compare ethnographic and archaeological patterns (Gould 1974). On the other hand, ethnoarchaeology is a "much broader general framework for comparing ethnographic and archaeological pattering" (Gould 1974:29).

Whereas archaeological data have allowed us to extend our information of our country's past way back from the earliest development, Junker (2000) argues that historical and ethnographic sources, which compose a large portion of our historical documents, accounts for the recent past. Therefore these multifaceted sources, when considered thoroughly and carefully, are complementary in providing practical avenues of understanding the distant past of the community being studied. However, the research does not involve an actual community immersion. Instead, the immersion is with a linguistic feature of the Tagalog community, an aspect of a community's culture. I shall go back to this point in the next section of this paper.

The method primarily employs analogy in trying to explain material culture recovered in an archaeological site. David and Kramer (2001:43) suggest that ethnographic analogies should be among the most important goals of an ethnoarchaeological investigation. And this analogical reasoning should assist in the interpretation of archaeological data. Wylie (2002:137) accepts that there are limitations on the use of analogical reasoning in archaeology; however, she claims that it is neither dispensable nor faulty. Instead, it could play a "legitimate, constructive role in archaeological inquiry" (Wylie 2002:137).

Moreover, the logic and analogy, derived from how ethnoarchaeology uses it, are used to deduce the system of goldworking technology among the Tagalogs during the 1600s from a vocabulary of the community. This analogy is therefore viewed as the bridge between the gold items recovered in the area and the inferences and explanation on how they were made that could be drawn.

The data is organised through the concept of c*haîne opératoire*. As charcaterised by Perlés (1987:23), it is a "succession of mental operations and technical gestures, in order to satisfy a need, according to a pre-existing project". The consideration of a process therefore, intends to describe and comprehend the changes, might it be physical, social or cultural, of a specific raw material (Sellet, 1993). Initially applied in the analyses of lithic technologies in prehistory, the concept has been very successful in providing valuable information about such development in the past, and is now being applied to other forms of technology. Schiffer (1972; 1975; 1976; 2004) has an almost similar idea about this succession of operations. He earlier referred to this as behavioural chain analysis, qualifying it as "the sequence of activities in the systemic context of any durable element [that] can be grouped in a set of basic processes and represented by a flow model" (Schiffer 1976:46).

Although developed separately in France and in North America, Sellet (1993) contends that both resulted to similar results, especially in suggesting meaningful stages, such as, raw material procurement, object manufacture, use, maintenance and discard, both *chaîne opératoire* and behavioural chain analysis look into the artefacts' physical properties in placing them within process and stages of transformation. This concept, if expanded further and allowed for the material's social dimensions, could be seen complementary to the recent researches on object life histories (Appadurai 1986; Gosden and Marshall 1999), which also look into changes of objects' properties and manufacture and use. The most important contribution of the development of *chaîne opératoire* however, is the idea that these processes let you analyse both physical and cognitive activities that in turn "open the way for addressing some of the complex social, ecological and cognitive dimensions surrounding ancient technical activities" (Renfrew and Bahn 2005:19). Finally, Dobres (2010:106) considers *chaîne opératoire* research as an "analytical methodology across the practical-cultural ontology divide" in the archaeologies of technology. It bridges empirical with theoretical perspectives on technology by recognising "real-world factors" reflecting both on artefact manufacture and design, and on "cognitive, symbolic and other social" phenomena dictating technological action (Dobres 2010:106-107). More so, Renfrew and Bahn (2005:20) claims that in *chaîne opératoire*, "anthropologists of techniques have been exploring the links between techniques and societies, in both modern and traditional settings", this makes *chaîne opératoire* agree to the aims of the paper.

A Linguistic Account

The study presents the Tagalog goldworking linguistic account of the sixteenth and seventeenth centuries from a lexicographic document. Equally important is that this paper has briefly presented the archaeological record as well as the ethnohistorical accounts in an attempt to provide context to this manufacturing process of gold objects in the Tagalog region.

Pejros (1997:155) defines a linguistic account as a description of "a community from a particular perspective with the limited framework provided by lexical reconstructions". More than a combination of all the linguistic findings pertaining to one cultural community, it is also an analysis of an important language feature, lexicon or lexical data. Pejros (1997) argues that a linguistic account is a vital data whereas all other accounts are secondary to it. However, there is no point in identifying the most important among these sources. Ethnohistory recommends that these sources are crucial corpus of information on their own rights, thus there could be multiple entries, in attempts to provide answers to questions about the past.

Shnirelman (1997:160) refers to this approach as linguoarchaeological reconstructions. However for him, this is a broader term that encompasses studies on chronologies, external cultural contacts, and "disintegrations of prehistoric linguocultural" entities. Pejros (1997), Saarikivi and Lavento (2009), and Shnirelman (1997) all agree that in these studies, an examination of a selected reconstructed lexicon, might it be in terms of ecological, technological and social aspects should be relevant to archaeological patterns. They all agree as well that in reconstructing past communities, linguistic change should also be accounted. This is however the limitation of the paper. It simply presents the linguistic account, in trying to discourse a possible relationship between the linguistic and the archaeological records.

Moreover, the very premise of this reconstruction is based on the idea that lexicon reflects the world of language speakers (Pejros 1997). Therefore it is theoretically possible, according to Pejros (1997:151) to analyse this world using lexical data, and to describe this world based "purely on evidence from a particular language". Each and every lexical entry does not necessarily reflect life ways in a community, more so older conditions since language does change to meet changing situations (Scott 1992). However, the paper cannot emphasise enough that such

compilations could be of great help. After all, relational analogy, inherent and causal linkages are more important than formal similarities. Therefore, such linguistic account should serve as an ethnohistoric document in which archaeological data could be juxtaposed

This article qualifies the linguistic account, a part of the ethnohistoric record. It looks into Fray San Buenaventura's *Vocabulario* as part of a larger Tagalog ethnographic record, and it is considered to be an ethnography of the late sixteenth and early seventeenth centuries, as it captures the period in the country's historical development when the culture of the inhabitants are not yet totally changed by the colonisation. Fray Pedro San Buenaventura, like most of the Spanish clergies who took careful notes about their new colonial possession, was an ethnographer in his own right. He was actually writing according to the ethnographic tradition of his time, the late Renaissance ethnology (Rubiés 2003).

San Buenaventura's *Vocabulario*

Scott (1982b, 1992) also laments that the Spanish colonial documents failed to describe gold use and manufacture in detail. Luckily, our search can be aided through the use of one important seventeenth-century lexicon. Scott (1982b, 1992) and Rafael (1988) view this historical lexicographic document, in the form of vocabulary or language feature, as sources of great information. Scott (1982b, 1992) argues that in coming up with these *vocabularios*, the lexicographers collected and defined the terms whether they were interesting to them or not. The craft may contain errors, but, it is "free of the deliberate distortions to which official correspondents were frequently tempted for the purpose of their own interests", since it was made by missionaries for the missionaries themselves (Scott 1992:73). This might not be true all the time, and in the contrary, the lexicographers themselves could choose and focus on the entries they wanted to include. Therefore, no matter how grand a dictionary is, still, it cannot reflect the totality of a culture's language, but Pejros (1997) claims one can find therein the most important features of a culture's life and society.

In particular, the paper scrutinizes *Vocabulario de lengua Tagala el romance castellaño presto primero*, or the Vocabulary of the Tagalog Language with Castilian Romance). This dictionary was compiled by Fray Pedro de San Buenaventura (1613), a Franciscan priest, tasked to propagate the Catholic faith in the towns of Paete, Nagcarlan, Santa Cruz,

Siniloan and Pila, in the province of Laguna. The *Vocabulario* was completed sometime in 1613 and was among the first, and thus significant seventeenth-century book printed by Tomas Pinpin (Woods 2011).

It was printed in Pila, Laguna. Between 1579 and 1611 Fray Pedro San Buenaventura noted Tagalog terms, defining them one after the other in Spanish and provided Tagalog sentences for each entry. Scott (1982b and 1992) believed that he had an access to an earlier vocabulary collection in manuscript done by another Franciscan, Fray Juan de Plasencia. This *Diccionario hispano-tagalog* is considered to be the first of its kind, but it is nowhere to be found now (Medina 1983).

Fray San Buenaventura's cultural language feature writing could be regarded as part of the Renaissance ethnographic writing tradition. This tradition was brought by the Spanish friar-chroniclers when they came to the Philippine archipelago. The act of describing and writing about the Philippine archipelago, as a new colonial possession, became an avenue where these ethnographers can practice this kind of travel writing genre.

Rubiés (2003:419) claims that this writing is part of the "literature of encounter", contending that a scientific aspect should be central to it, "but only as defined with reference to contemporary assumptions about what 'science' was". The ethnohistoric literature is further divided into two traditions. While the lay writing tradition was done through active involvement of members of the colonial system of conquest, trade and administration, the religious tradition of recording on the other hand, was recorded in behalf of their missionary congregations (Rubiés 2003). In any other cases, most of them were encouraged by their religious orders.

San Buenaventura, in composing the *Vocabulario*, might have been conscious in representing each and every aspect of Tagalog society and culture. Gathering information about a particular aspect, say goldworking, is never incidental; rather, it is an act of focusing on this particular facet of community life. This paper therefore, does not subscribe to Scott's (1982a:1) idea that "these [the dictionary entries] are more often than not, unintentional and merely incidental to the purpose of the documents containing them".

Judging the writing as incidental might be a modern-day prejudice –a present-day take of how documents were written. Recalling the late Renaissance ethnographic writing tradition could guide us in

understanding that the creation of the *Vocabulario* is done in a "systematic" manner. In documenting the culture's vocabulary, Buenaventura's aim might have been to include goldworking technology of the Tagalogs.

It was done according to his concept of objectivity, bearing in mind that it must be inclusive since it will be used for an array of reasons in the future. After all, according to Rubiés (2003:422), "it was those missionaries living amongst the islanders in rural areas, learning their languages and presiding over their communal lives, who generated a specialized ethnography which went beyond the superficial observations of occasional visitors".

The use of a major lexicographic document, the *Vocabulario*, in reconstructing ancient gold working technology in the Tagalog region, aims to reconstruct a cultural dimension from the analysis of a lexicon. The lexicon, or dictionary, is considered a linguistic feature as much as it is as well an ethnographic document. It lists the words presumably used by the population and describes objects, places, and practices during the time it was compiled. Pejros (1997:150) believes that "information about a speaker's world is kept mostly in the language's lexicon".

Not only that the *Vocabulario* defines these words, but more importantly, it provided examples deemed to be reflective of the social, economic, and political lives of the people. Analysis of a dictionary, accordingly, can localise the community being studied, or place it on a geographical unit, either through its ecological, ethnic, or cultural facet (Pejros 1997; Shnirelman 1997).

Pejros (1997) further suggests that in the process of localising lexicon entries in its cultural dimension in particular, words can be subdivided into three: economic activities, social structure, and beliefs. For the purpose of this study, each dictionary entry reflecting economic activities associated with gold industries will be examined, to reconstruct of the ancient goldworking tradition of the Tagalogs.

Saarikivi and Lavento (2009:178) suggest three correlations between archaeology and linguistics that are "more reliable and fruitful, even if they also are less universal and less telling" from the perspectives of the speakers in the past. The first is the local correlation of physical and toponymic environments and archaeological sites. The second is the correlation of ecological areas, speech communities and clusters of

archaeological findings (Saarikivi and Lavento 2009). The third correlation is the interest of the paper, in which it intends to explore a correlation of widespread linguistic features and materials, technologies, artefact types, and in particular, archaeological techno-complexes.

This paper tries to organise a meaningful system and other subsystems for the Tagalog ancient goldworking technology through the examination of lexicography to emphasise the correspondence between language and archaeological materials present in an area. In doing so, it intends to suggest an operational chain, or sequence for goldworking technology of the ancient Tagalogs.

Ancient Tagalog Goldworking according to San Buenaventura's *Vocabulario*

Gold was mentioned in 228 entries in the *Vocabulario*. Tiongson (2013), observed 122 examples mentioning gold in the same dictionary. Moving beyond statistics however, it is important to note that entries in *Vocabulario* are citadels of colossal information waiting to be discovered. Indeed, the word *oro* appears many times as entries themselves and/or as subjects of sentence usage examples. From these entries I was able to deduce valuable insights about how the Tagalog population regarded gold that I can describe a technological tradition that thrived about half a millennium ago.

The succeeding sections of this paper present and analyse the entries in San Buenaventura's *Vocabulario* pertaining to goldworking processes. This analysis is a product of careful reading and translating each entry in the dictionary before bringing them together under one category. A brief listing of these entries and translation can be seen in Table 1.

Ginto, as it appears in the lexicon, is a more general term for this distinct metal.. The people of the Tagalog region are very much familiar with this material due to its economic importance as among the main commodities they exchanged with themselves and with the foreign cultures, especially the Chinese traders (Franke 1970; Wang 1972).

In fact, Scott (1994) asserts the connection of *ginto* with the Chinese *jinzi* or *kintoy.* Potet (2014) traces the word to Chinese *jin-dou*, gold grain, or *jintou*, gold head. *Bulawan* is another general term for gold in the archipelago, but the *Vocabulario* does not mention it, because it is a

Visayan term. Aside from the general term itself, listed and defined as well are other words pertaining to gold's different states, especially how gold were obtained, processed, used, and disposed

Panday is the general term used in the dictionary to denote workers or labourers of a certain craft. There are *panday de plata*, the one working with silver and *panday bacal*, who works with other types of metal. Specifically, goldsmiths are referred to as *panday ginto*, to emphasize the craft they specialize in.

Raw Materials Procurement

Dolang was the Tagalog term for mines and the place where people obtain their metal resources, including gold, was referred to as *dolangan*. The San Buenaventura dictionary however does not specify the types of mines there were. But, we see a similar term in Mallat's (1846) work as he noted, in the island of Cebu in the Visayas, of *dulan*, the process by which people drew from sand, gold of high grade. In addition, Scott (1994) asserts that placers in the Visayas were referred to as *dulangan*, a term derived from the wooden pan used. *Dolangan* or *dulangan* could therefore be the place where people mine or the process of mining itself.

Bennett (2009:100) suggests that most of the gold in the prehistoric and early historic periods in Southeast Asia would have been sourced from alluvial sediments through panning since this method only requires few "capital investments in equipment and no specialist technology". Unfortunately this method left little to no archaeological evidence.

Morga (1609) mentioned placers in the rivers of Butuan and Cebu. He also noted mines in Camarines and the Cordilleras. Bennett (2009) agrees citing the abundance of load deposits in Luzon and in Mindanao. In Luzon, Beyer (1947) supports these accounts, identifying ancient gold mines in the Cordilleras in the north, and in Paracale in Camarines Norte in the south, through recovered gold mine workings and tools.

Paracale was connected to Manila through the route that passes through Libon, Tayabas in Quezon and Pila in Laguna (Tiongson 2006; 2013). According to Santiago (2005:59), yields from these gold sources reached Manila through these "gold routes". In fact, Spanish villas were later established along these routes, with the southern part extended to accommodate the Chinese and the coastwise trade in the Visayas centred in Cebu and Panay (Santiago 2005; Tiongson 2013).

Table 1: Table showing the materials, tools and products involved in the different stages of gold objects production.

MATERIAL	PROCESS	TOOL	PRODUCT
I. Raw Material Procurement			
naturally-occurring gold	***dolangan***; ***dolang*** (mining; place of mining)	***Dolangan*** (wooden pan)	***vagas*** (gold dusts and bits) ***boo*** (large gold)
II. Material Processing			
uysac (coal) ***vagas*** (gold dusts and bits) ***pilac*** (silver) ***tumbaga*** (copper)	***ylic*** (heating and melting) ***sangag*** (purifying and refining) ***sombat*** (combining gold with silver) ***sobong*** (combining gold, copper, and silver) ***piral*** (welding with the use of copper and silver)	***sangagan***; ***sangagang patotonaua***, (pot, crucible)	***lata*** (soft gold) ***boo*** (large gold) ***mistola*** (pure, unalloyed gold)
III. Object Production and Manufacture (Forming)			
lata (soft) ***boo*** (large gold) ***mistola*** (pure unalloyed gold) ***pilac*** (silver) ***tumbaga*** (copper)	***hibo*** (forming; gilding) ***alat-at***; ***gitang*** (splitting) ***tungmatatac*** (cutting) ***batbat***; ***talag*** (hammering) ***lantay*** (beating) ***batac*** (stretching) ***pilipit*** (twisting) ***binobo*** (fusing) ***hinang*** (soldering) ***piral*** (bonding by the use of silver or copper)	***pamatbat***; ***panalag*** (hammer) ***panlantay*** (beating instrument)	***tatac*** (workable gold cuts) ***onbit*** (gold bits of little worth) ***lamoc*** (torn gold) ***lantay*** (gold foil)

IV. Object Manufacture and Production (Designing)			
tatac (workable gold cuts) ***lantay*** (gold foil) (ochre) (gems, jewels) (aromatics)	***dauadaua*** (styling and filigree work) ***sapo***; ***dungmadalag*** (polishing) ***bair***; ***naynay*** (burnishing) ***bitang*** (sleek styling) ***tocol*** (chiselling) ***calopcop*** (garnishing) ***salac*** (accessorising with gems and aromatics)	***pamair*** (polishing Instrument) ***panocol*** (chisel)	gold objects, jewelleries and other forms of ornaments
VI. Assaying and Reworking			
(gold objects, jewelleries and other forms of ornaments)	***ori*** (assaying)	***orian*** (magnet; touchstone) ***caray*** (weighing container)	***balat*** (fake gold) ***tonay*** (genuine)
V. Object Discard			
(gold objects, jewelleries and other forms of ornaments)	***baon*** (burying)	***caray*** (container for gold)	***baon*** (grave good) ***mana***; ***malcquing ginto*** (heirloom gold pieces)

Material Processing

The yields of the mine could be of two types, according to San Buenaventura's (1613) dictionary. While g*intong boo* refers to large pieces of gold, *gintong vagas* on the other hand, pertains to gold dusts, powder, or bits. Either yield was to be amassed, enough to produce the needed amount of gold for later purposes. The dictionary includes terms involved in the initial processing of these yields. *Sangag* is the process of purifying and refining gold obtained from the mine. Accordingly, s*angagan* is the pot or the crucible used in the process. The procedure involves *ylic*, or the heating and melting of the metal. As for Bennett (2009) the extent by which workers employed cupellation or the process of refining the material in order to separate the needed material from other material present from the mine is quite unclear. At this stage, separate pieces of *gintoong boo* and *gintong vagas* are combined together to achieve the desired amount or size of gold. The gold is now referred to as *lata*, or in the state of *calataan*, since it is soft due to melting, and called alloying. Subsequent to the reductions, other metals are also added to gold, perhaps to harden the metal. San Buenaventura (1613) noted the addition of *pilac* (silver) and *tumbaga (*copper) to gold. However, *tumbaga* is defined as the combination of gold and copper itself, transforming the colour to red, whereas the combination of gold and silver is *sombat*, turning the colour of the metal to white. The combination of gold, silver, and copper, however, is mentioned as *sobong*, and the gold left unalloyed, unmixed, and therefore remained pure, is called *mistola*.

Alloying gold with silver and copper has been observed many times in the archaeological record throughout the world (Bennett 2009; Guerra 2008; Guerra and Calligaro 2003). It is argued that early populations added silver and copper to gold in order to achieve desired colour (Read 1934), and the control of gold's mechanical properties (hardness, strength, and ductility, among others) through alloying is mostly secondary (Guerra 2008; Guerra and Calligaro 2003). Successively, joining together different gold pieces is termed as *piral*, which is welding with the use of silver and copper. Guerra (2008) explains further that joining gold pieces together proved to be more effective when copper and silver are added, thus, the strength and other mechanical properties are increased.

At this stage, the *uysac* is very important since it provides the necessary heat. The dictionary defines *uysac* as a distinctive coal used in

both reduction and addition sequences. However, curiously it was defined further as a "coal of a wood you cannot melt the Chinese gold or silver with" (San Buenaventura 1613:149).

Object Manufacture and Production

Having achieved the desired size, firmness and colour, the gold becomes ready to be worked through the use of an array of technical choices. Different techniques must have involved different skills and handiwork and, thus, must have a variety of goals. Therefore, object production and manufacture could be further differentiated between forming techniques and decorating techniques. Forming techniques are generally termed as *hibo* since the Tagalog word is often used to denote an array of gold forming processes. However, a separate entry in the dictionary defines it as the process of gilding. The simplest procedure among the forming techniques is cutting. The dictionary listed three methods of cutting gold, with perhaps no significant differences. *Alat-at* and *gitang* are acts of splitting gold from a cleavage or rift, whereas the method of *tungmatatac* is a deliberate act of cutting. There was no mention of any cutting instrument. Those cut gold pieces , which are too small and cannot be linked with other objects are deemed to be of little worth or *onbit*, whereas, gold that is torn into insignificant pieces are referred to as *lamoc*. There was no mention of what they do to *onbit* pieces. An initial step, therefore in producing objects out of gold is dividing it into workable *tatac*, or gold cuts, which are then ready to be further worked.

Batbat is hammering and *talag* is beating the gold into flat pieces. Using either *pamatbat* or *panalag*, the objective to is to produce thin sheets. Likewise, *lantay*, is the method of beating gold for it to become elongated through the use of a *panlanta*. There were no further descriptions of the tools. *Lantay*, is defined in the dictionary as gold foil or leaf itself. Some gold cuts are further thinned and elongated. This procedure is referred to as *batac*, the act of stretching gold pieces, causing the formation of wire strands deemed apt for the creation of loops and chains. These chains maybe twisted or *pilipit* to achieve desired form. Ultimately, assembling one gold piece to another involves *bobo* (fusing) and/or *hinang* (soldering) or through *piral (*bonding) by the use of silver and copper.

In the archaeological literature in Southeast Asia and Europe, products of primary manufacturing techniques often appear as worked leaf gold (Bennett 2015; Guerra 2008; Guerra and Calligaro 2003). Fox and Santiago (1985) further noticed that these workable sheets can be turned

into other objects such as in bead manufacture in Palawan wherein gold that has been hammered into extremely thin sheets. This is then probably used into several decorative techniques ranging from simple rolling to form a bead to plating and gilding stone sculptures.

Decorative techniques might have been the other category of manufacturing techniques. Such techniques could have come before or after its forming counterparts. *Davadava* is the general term used to mean styling and filigree work. It usually involves processes do not greatly change the general appearance of the object but instead enhance either its visual appeal. Lustre, *cquinang* or *dalag*, is among the most adored qualities of gold in early Tagalog society. San Buenventura's dictionary emphasises the importance of shining gold objects by noting at least three processes of bringing out and maintaining its lustre.

Both the processes of *sapo* and *dungmadalag* bring out gold's lustre through polishing; they also rub in ochre to increase its reddish colour. *Bair* and *naynay* are also similar processes of polishing or burnishing gold, with *pamair* as a polishing instrument. Like other tools mentioned, the *Vocabulario* does not describe them in detail. A different way of polishing gold objects is *bitangan*. In this polishing process sleek styling is usually done through simple welding works. In addition, there is *tocol*, the method of chiselling. Using a *panocol*, designs are carved on the surface. Finally, gold objects are in many ways, decked with other precious materials. *Calopcop* is the practice of embellishing gold objects, with precious stones. *Salac*, on the other hand, is a technique of garnishing gold objects with aromatics.

According to Pryce *et al.* (2008) the value of gold in the archaeological record lies primarily on its decorative nature. They assert that "gold ornaments are a useful resource when investigating typological evidence for cross-cultural interaction due to their decorative nature" (Pryce *et al.* 2008: 308). Analysis of style, décor, and iconography proved to be fruitful in studies on gold in the past (Bronson 1975; Francisco 1963, 1979; Guy 2011; Harrisson 1949, 1968; Miksic 2011, 2013).

Villegas (1998, 1999, 2004) describes the general characteristic of pre-colonial gold objects from the Banko Sentral ng Pilipinas collection as ornaments consisting of multiple parts. They range from the simple sheets and beads to complex gold works such as chains made from the combination of simpler gold works. Its "segmentary nature" paved the way for "eccentricity and individual expression" (Villegas 1998: 236-237).

Gold was probably viewed as a very manageable material since it could be worked into ornamental objects ranging from beads, earrings, pendants, diadems and belts. The ease to shape and form gold is evident also with the intricacy of the techniques employed in working with gold objects.

Reworking and Assaying

Reworking of gold, on the other hand, is also a possibility. In fact, gold has been sought after because of its ability to be reworked into new objects. Bennett (2009:102) stated that because gold is never thrown away, it has, most probably, been recycled and traded many times. However, there are no Tagalog terms that refer to this process of recycling in the San Buenaventura dictionary. Still, Bennett (2009) and Villegas (1999; 2004) believe that gold goes through the process of reworking.

There are terms that talk about the process of assaying or *ori*. In using the *orian*, or a touchstone, the Tagalogs might have the ability to instantaneously know the quality of gold. The initial test might have been whether a gold object is *binalatan* or *tonay*, genuine or not. When the object was ascertained to be made of gold, the next test its quality. The dictionary made mention of the quality spectrum of gold as it was referred to during the 1600s. *Dalisay* is the highest in the spectrum with 24 karats, seconded by *ginogulan* with 22 karats, next is *hilapo* with 20 karats, *panangbo* with less than 20 karats, *panica* with 18 karats, *linging-in* with 14 karats, and *bislig* with only 12 karats. *Malubay* and *hotoc* are defined as almost copper, gold with the lowest quality, perhaps, below 10 karats. Each category is further divided into two, the *matanda* and the *bata*, a step superior and inferior than it. The system perhaps was to specify the quality of a classification wherein for an instance; gold with a quality of *hilapong bata* is not a straightforward *hilapo* or 20 karats. Likewise, a *bislig matanda* is short of being a straightforward *linging-in* or 14 karat gold.

Object Discard

Gold, perhaps, is never thrown away. However, there are two ways the Tagalog population disposed this metal. The dictionary provided a quite long definition for the word *baon*, the first of these disposals. Accordingly, *baon* is the term used to denote any objects the people bury with their dead. Based on the ethnohistoric accounts, on the Tagalogs mentioned earlier, gold was a part of the bundle they buried with the dead (Chirino 1604; Colin 1663; Plasencia 1589). On the other

hand, gold was disposed also when they are relegated as heirloom pieces since they were removed from the general circulation this is apparent with how San Buenaventura (1613) listed related terms like *camanahan* and *malacquing ginto*. *Camanahan* according to the dictionary is what your parent left as inheritance in terms of gold, whereas *malacquing ginto* is a gold hoard that can be found hidden.

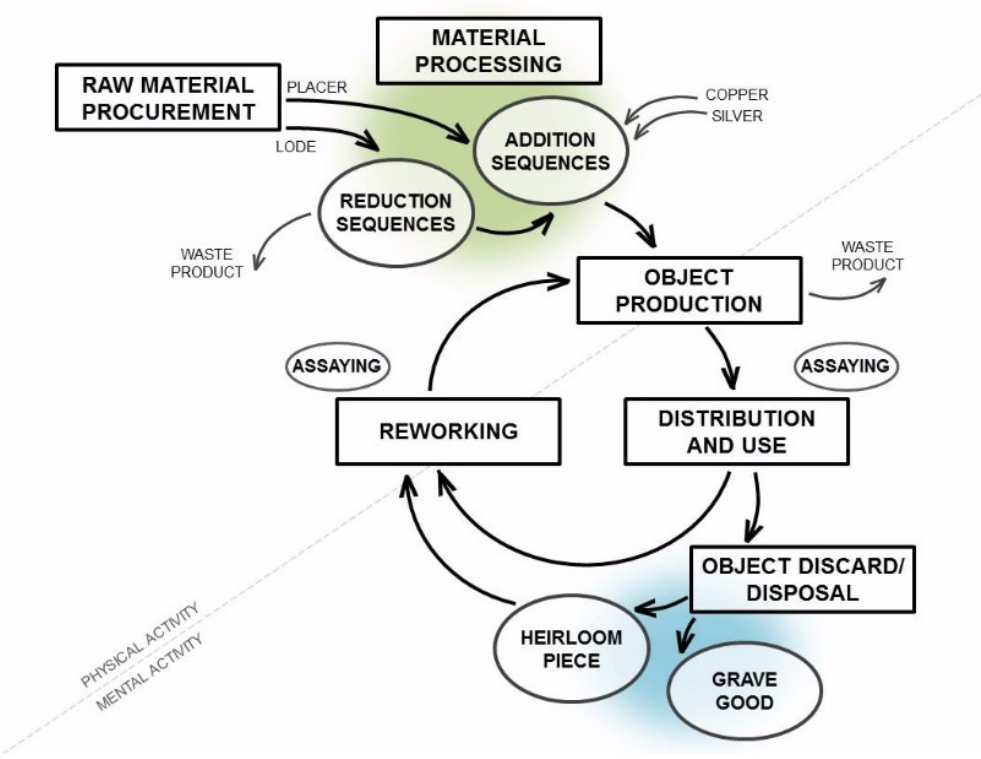

Figure 4: A diagram showing the socio-technological order of production of gold in the Tagalog region based on San Buenaventura's *Vocabulario*.

Conclusion

Fray Pedro de San Buenaventura's (1613) *Vocabulario de Lengua Tagala* proved to be a great source of information about the Tagalog community's goldworking technology during the early years of the seventeenth century. In this lexicographic document, we were informed about names of objects as well as activities associated with gold industry and technology. More than listing and defining them, *Vocabulario* somewhat confirms the existence of such tradition in the region and in the past.

Searle (2007:5-6) suggests that language does not just label a

pre-existing reality, "but is partly constitutive of the reality that it describe". Therefore, the words, the lexical data themselves attest that they were used in this kind of activities. In turn, the study investigated a system and the subsystems they entail. Through the frame suggested by the concept of *chaîne opératoire*, we were able to look into the processes involved in the ancient technology in detail.

The objective of the paper is to provide a socio-technological context, as well as a possible guide for material patterning in the archaeological record, and for analysing ancient goldwork together with other related artefacts. The paper's key contribution is its attempt to examine lexicographical entries in San Buenaventura's *Vocabulario de lengua Tagala*, a lexicon produced at the break of the sixteenth and seventeenth century, and organise them through the frame provided by technology studies in archaeology –the *chaine opératoire*. Such organisation helped build this linguistic account of the ancient goldworking technology in the Tagalog region. In addition, as a tool, the *chaine opératoire* provided an avenue for analysing the transformation of gold in its monotonic socio-technological system of production.

Thus, we were informed by this linguistic account that ancient Tagalog goldworking consisted of forming and decorative activities evident with the terms pertaining to the processes and techniques employed in the technology. In return, this becomes a corpus of information on the other side of the analogy. The details we are able to see, with the help of the *chaine opératoire* approach, could be of great value in examining details in the archaeological record.

Tiongson (2013) argues, and as Canilao (2013) agrees, the Tagalog language is among the few languages that apparently accommodates a huge amount of words and terms in describing objects, activities, and practices associated with gold, goldsmiths, and goldworking. Hence, this exhibits the great importance of this metal in the lives of the Tagalogs, even before the coming of the Spaniards in the 16th century (Tiongson 2013).

References

Appadurai, A. (ed.). 1986. *The social life of things: commodities in cultural perspective.* Cambridge: Cambridge University Press.

Barretto-Tesoro, G. 2008. *Identity and Reciprocity in 15th Century Philippines*. *BAR International Series 1813*. Oxford: John and Erica Hedges Ltd. British Archaeological Reports.

Bennett, A. T. N. 2009. Gold in early Southeast Asia. *ArcheoSciences: revue d'archéométrie* 33: 99-107.

Bennett, A. T. N. 2015. "Ancient gold and modern fakes in Southeast Asia", in *Gold in Early Southeast Asia: Selected Papers from the Symposium Gold in Southeast Asia*. Edited by R. Barnes, E.N. Stein, and B. Diebold, pp. 183-236. Connecticut: Yale University Southeast Asia Studies.

Beyer, H. O. 1947. Outline review of Philippine archaeology by islands and provinces. *The Philippine Journal of Science* 77 (3-4): 205-374.

Beyer, H. O. and J. C. de Veyra. 1947. *Philippine saga: pictorial history of the archipelago since time began*. Manila: The Evening News.

Boxer Manuscript. 1595. "The manners, customs and beliefs of the Filipinos of long ago", in *Readings in Philippine prehistory*. Edited by M. Garcia, pp. 307-357. Manila: The Filipiniana Book Guild.

Boxer Codex. *The Lilly Library Digital Collections*. Accessed 16 May 2016 from http://www.indiana.edu/~liblilly/digital/collections/items/show/93.

Bronson, B. 1975. Field Museum's Agusan gold image. *Field Museum Bulletin* 46 *(7)*: 5.

Caballero, E. J. 1992. *Gold from the gods: traditional small-scale miners from Benguet Province, Philippines*. Unpublished Ph.D. dissertation. University of Hawaii, Manoa.

Caballero, E. J. 1996. *Gold from the gods: traditional small-scale miners in the Philippines*. Quezon City: Giraffe Books.

Canilao, M. A. P. 2008. *Understanding the peopling of Benguet through oral tradition, ethnohistory and archaeology.* Unpublished Master's thesis. University of the Philippines, Diliman.

Canilao, M. A. P. 2009. Fording upstream in search for balitok: Ibaloi diaspora into Benguet (part 1). *Hukay* 14: 91-110.

Canilao, M. A. P. 2010. Lost in the retelling: washed-out balitok (gold) in Ibaloi generational memory Ibaloi diaspora into Benguet (part 2). *Hukay* 15: 21-29.

Canilao, M. A. P. 2011a. *Of gold, Spanish conquistadors, and Ibaloi generational memory*. Baguio City: University of the Philippines Baguio Cordillera Studies Centre.

Canilao, M. A. P. 2011b. Transformations in Ibaloi gold extraction from the protohistoric period to the current era (14th to 20th century). *Aghamtao* 20: 146–164.

Canilao, M. A. P. 2013a. "Ang ginto ng Tagalog at ang tradisyunal na teknolohiya sa pagmimina nito", in *Ang saysay ng inskripsyon sa binatbat na tanso ng* Laguna. Edited by M.C. Peñalosa and Z.A. Salazar, pp. 309-324. Quezon City: Pila Historical Society and Bagong Kasaysayan.

Canilao, M. A. P. 2013b. Proposal for a Surface Archaeology Methodology in Bluff lands Archaeology (the Cordillera region of Luzon. *Hukay* 18: 82-89.

Canilao, M. A. P. 2015. "The Ibaloi Miners of Northwestern Luzon and their Traditional Method of Gold Extraction, Processing, and Working Dating to as Early as the Fourteenth Century", in *Gold in Early Southeast Asia: Selected Papers from the Symposium Gold in Southeast Asia*. Edited by R. Barnes, E.N. Stein, and B. Diebold, pp. 168-182. Connecticut: Yale University Southeast Asia Studies.

Capistrano-Baker, F. H., J. N. Miksic and J. Guy. (eds). 2011. *Philippine Ancestral Gold*. Singapore: Ayala Foundation, Inc. and National University of Singapore Press.

Capistrano-Baker, F. H. 2013. The Ayala Museum's gold collection. *Arts of Asia* 43(1): 52-65.

Chau J. K. 1225. "Chu fan-chih", in *Chau Ju-Kua: His work on the Chinese and Arab trade in the twelfth and thirteenth centuries, entitled, Chu Fan-Chi*. Edited and Translated by F. Hirth and W.W. Rockhill. St. Petersburg: Printing Office of the Imperial Academy of Sciences, 1911.

Chirino, P. 1604. "Relacion de las Islas Filipinas ***y*** de lo que en ellas an trabajado los padres de la Compañia de Jesus", in *The Philippine*

Islands, 1493-1898 Volume XII. Edited by E.H. Blair and J.A. Robertson, pp. 173-321. Cleveland: Arthur H. Clark Company, 1903-1909.

Colin, F. 1663. "Labor evangelica ministerios apostolicos de los obreros de la Compañia de Jesus, fundacion y progresos de Islas Filipinas", in *The Philippine Islands, 1493-1898 Volume XL*. Edited by E.H. Blair and J.A. Robertson, pp. 37-48. Cleveland: Arthur H. Clark Company, 1903-1909.

David, N. and C. Kramer. 2001. *Ethnoarchaeology in Action*. Cambridge: Cambridge University Press.

Dobres, M. 2010. Archaeologies of technology. *Cambridge Journal of Economics* 34: 103-114.

Esguerra, K. 2013. Philippine gold working techniques. *Arts of Asia* 43 (1): 89-93.

Fox, R. B. 1959. The Calatagan excavations. *Philippine Studies* 7 (3): 321–389.

Fox, R. B. 1967. The archaeological record of Chinese influences in the Philippines. *Philippine Studies* 15 (1): 41-62.

Fox, R. B. and R. A. Santiago. 1985. Ancient beads from the Philippine archaeological sites. *SEAMEO SPAFA Regional Centre for Archaeology and Fine Arts Digest* 6: 4-23.

Francisco, J. R. 1963. A note on the golden image of Agusan. *Philippine Studies* 11 (3): 390-400.

Francisco, J. R. 1979. The golden garuda from Brooke's Point, Palawan. *Archipelago* 6: 12-14.

Franke, W. 1970. Chinese historical sources on Southeast Asia. *Philippine Historical Review* 3: 39-57.

Gosden, C. and Y. Marshall. 1999. The cultural biography of objects. *World Archaeology* 31 (2): 169-178.

Gould, R. A. 1974. "Some current problems in Ethnoarchaeology", in *Ethnoarchaeology*. Edited by C.B. Donnan and C.W. Clewlow, Jr., pp. 27-48. California: Institute of Archaeology, University of California, Los Angeles.

Guerra, M. F. 2008. An overview on the ancient goldsmith's skill and the circulation of gold in the past: the role of x-ray based techniques. *X-Ray Spectrom* 37: 317–327.

Guerra, M. F. and T. Calligaro. 2003. Gold cultural heritage objects: a review of studies of provenance and manufacturing technologies. *Measurement Science and Technology* 14: 1527–1537.

Guy, J. 2011. "Gold in the Philippines: form, meaning and metamorphosis", in *Philippine Ancestral Gold.* Edited by F.H. Capistrano-Baker, pp. 163-190. Singapore: National University of Singapore Press.

Harrisson, T. 1949. Gold and Indian influences in West Borneo. *Journal of the Malaysian Branch of the Royal Asiatic Society* 22 (4): 33-105.

Harrisson, T. 1968. Gold: west Borneo and Philippine crafts compared. *Journal of the Malaysian Branch of the Royal Asiatic Society* 16 (32-33): 77-84.

Junker, L. L. 2000. *Raiding, trading, and feasting: the political economy of the Philippine chiefdoms*. Quezon City: Ateneo de Manila University Press.

Kramer, C. 1979. "Introduction", in *Ethnoarchaeology: Implications of Ethnography for Archaeology*. Edited by C. Kramer, pp. 1-20. New York: Columbia University Press.

Kuang-Jen, C. 2008. *Social Use and Value of Trade Ceramics: An Analysis of Mortuary Practices in Calatagan, Southwest Luzon, the Philippines.* Unpublished Ph.D. dissertation. University College London.

Legazpi, M. L. De. 1569. "Relation of the Filipinas Islands and of the character and conditions of their inhabitants", in *The Philippines, 1493-1898 Volume III*. Edited by E.H. Blair and J.A. Robertson., pp. 54-61. Cleveland: Arthur H. Clark , 1903-1909.

Locsin, L. and C. Locsin. 1967. *Oriental ceramics discovered in the Philippines.* Tokyo: Charles E. Tuttle Co.

Longacre, W. (ed.). 1991. *Ceramic Ethnoarchaeology*. Tucson: University of Arizona Press.

Mallat, J. 1846. *Les Philippines: Histoire, Geographie, Meurs, Agriculture, Industrie, Commerce*. Manila: National Historical Institute.

Medina, I. R. 1983. Ang kasaysayang panlipunan ng Pilipinas: isang rekonstruksyon mula sa mga diksyunario't bokabularyong Tagalog 1600-1914. *Asian Studies Journal* 21:20-40.

Miksic, J. N. 2011. "Gold and cultural evolution in early Southeast Asia", in *Philippine Ancestral Gold*. Edited by F.H. Capistrano-Baker, pp. 137-161. Singapore: National University of Singapore Press.

Miksic, J. N. 2013. Philippine gold in early Southeast Asia. *Arts of Asia* 43 (1): 66-77.

Morga, A. de. 1609. "The Philippine Islands", in *The Philippine Islands, Moluccas, Siam, Cambodia, Japan, and China, at the close of the sixteenth century*. Translated by H.E.J. Stanley. Cambridge: Cambridge University Press, 2010.

Pejros, I. 1997. "Are correlations between archaeological and linguistic reconstructions possible?", in *Archaeology and language: theoretical and methodological orientations*. Edited by R. Blench and M. Spriggs, pp. 149-157. London: Routledge.

Perlés, C. 1987. *Les industries lithiques taillees de Franchthi, Argolide: presentation generale at industries paleolithiques*. Terre Haute: Indiana University Press.

Plasencia, J. de. 1589. "Customs of the Tagalogs", in *The Philippines Islands 1493-1898 Volume VII*. Edited by E.H. Blair and J.A. Robertson, pp. 173-196. Cleveland: Arthur H. Clark Company, 1903-1909.

Potet, J. P. G. 2014. *Ancient beliefs and customs of the Tagalogs*. North Carolina: Lulu Press, Incorporated.

Pryce, T., B. Bellina-Pryce and A. Bennett. 2008. The development of metal technologies in the upper Thai-Malay Peninsula: initial interpretation of the archaeometallurgical evidence from Khao Sam Kaeo. *Bulletin de l'Ecole Française d'Extreme-Orient* 93: 295-315.

Rafael, V. L. 1988. *Contracting colonialism: translation and Christian conversion in Tagalog society under early Spanish rule*. Quezon City: Ateneo de Manila University Press.

Read, T. T. 1934. Metallurgical fallacies in archaeological literature. *American Journal of Archaeology* 38 (3): 382-389.

Renfrew, C. 1986. "Varna and the emergence of wealth in prehistoric Europe", in *The social life of things: commodities in cultural perspective*. Edited by A. Appadurai, pp. 141-168. Cambridge: Cambridge University Press.

Renfew, C. and P. Bahn. 2005. *Archaeology: the key concepts*. London: Routledge.

Rubiés, J. P. 2003. The Spanish contribution to the ethnology of Asia in the sixteenth and seventeenth centuries. *Renaissance Studies* 17 (3): 418-448.

Saarikivi, J. and M. Lavento. 2009. "Linguistics and archaeology: a critical view of an interdisciplinary approach with reference to the prehistory of Northern Scandinavia", in *Proceedings of the Conference on Networks, Interaction and Emerging Identities in Fennoscandia and Beyond,* pp. 177-216. Helsinki: Finno-Ugrian Society.

San Buenaventura, P. de. 1613. *Vocabulario de la lengua Tagala*. Pila: Tomas Pinpin and Domingo Loag.

Santiago, L. P. R. 2005. Pomp, pageantry and gold: the eight Spanish villas in the Philippines (1565-1887). *Philippine Quarterly of Culture and Society* 33 (1): 57-75.

Schiffer, M. B. 1972. Archaeological context and systemic context. *American Antiquity* 37: 157-165.

Schiffer, M. B. 1975. Behavioural chain analysis: activities, organization, and the use of space. *Fieldiana* 65: 103-74.

Schiffer, M. B. 1976. *Behavioural archaeology*. New York: Academic Press.

Schiffer, M. B. 1978. "Methodological issues I ethnoarchaeology", in *Explorations in ethnoarchaeology*. Edited by R.A. Gould, pp. 229-247. Albuquerque: University of New Mexico Press.

Schiffer, M. B. 1988. Structure of archaeological theory. *American Antiquity* 53: 461-85.

Schiffer, M. B. 2004. Studying technological change: a behavioural perspective. *World Archaeology* 36 (4): 579-585.

Scott, W. H. 1982a. *Cracks in the parchment curtain: and other essays in Philippine history*. Quezon City: New Day Publishers.

Scott, W. H. 1982b. "Sixteenth-century Tagalog technology from the Vocabulario de lengua Tagala of Pedro de San Buenaventura, OFM, Pila, 1613", in *Gava': studies in Austronesian languages and culture dedicated to Hans Kahler*. Edited by R. Carle, pp. 523-535. Berlin: Dietrich Reimer Verlag.

Scott, W. H. 1984. *Prehispanic source materials for the study of Philippine history*. Quezon City: New Day Publishers.

Scott, W. H. 1992. *Looking for the prehispanic Filipino and other essays in Philippine History*. Quezon City: New Day Publishers.

Scott, W. H. 1994. *Barangay: sixteenth-century Philippine culture and society.* Quezon City: Ateneo de Manila University Press.

Searle, J. R. 2007. "Social ontology and the philosophy of society", in *Creations of the mind: theories of artifacts and their representation*. Edited by E. Margolis and S. Laurence, pp. 3-17. Oxford: Oxford University Press.

Sellet, F. 1993. *Chaîne opératoire*: the concept and its applications. *Lithic Technology* 18 (1): 106-112.

Shnirelman, V. 1997. "Linguoarchaeology: goals, advances and limits", in *Archaeology and language: theoretical and methodological orientations*. Edited by R. Blench and M. Spriggs, pp. 158-165. London: Routledge.

Solheim II, W.G. 2002. *The archaeology of central Philippines*. Quezon City: University of the Philippines-Archaeological Studies Program.

Stiles, D. 1977. Ethnoarchaeology: a discussion of methods and applications. *Man* 12:87-103.

Teh-Ming, W. 1974. Notes on Ma'I in Chu Fan-Chih. *Philippine Historical Review* 5: 19-34.

Tiongson, J. F. 2006. The Laguna Copperplate Inscription and the route to Paracale. *Paper presented at the Seminar on Philippine Town and Cities: Reflections of the Past, Lessons for the Future.* Pasig City.

Tiongson, J. F. 2013. "Ang saysay ng inskripsyon sa binatbat na tanso ng Laguna" in *Ang saysay ng inskripsyon sa binatbat na tanso ng Laguna.* Edited by M.C. Peñalosa and Z.A. Salazar, pp. 17-86. Quezon City: Pila Historical Society and Bagong Kasaysayan.

Trigger, B. 2006. *A History of Archaeological Thought*. Cambridge: Cambridge University Press.

Villegas, R. N. 1998. "The legacy of a golden age", in *Kasaysayan, The Story of the Filipino People 2: The Earliest Filipinos*. Edited by G.S. Casal, E.Z. Dizon, W.P. Ronquillo and C.G. Salcedo, pp. 236-237. Hong Kong: Asia Publishing Company Limited.

Villegas, R. N. 1999. *Sining ng panahong ginintunan*. Manila: National Commission for Culture and the Arts.

Villegas, R. N. 2004. *Ginto: history wrought in gold*. Manila: Bangko Sentral ng Pilipinas.

Villegas, R. N. 2013. "Isles of gold and realms of exchange", in *Philippines: an archipelago of exchange*. Edited by C. Alvina and C. de Monbrison, pp. 100-131. Paris: Musée du Quai Branly.

Woods, D. L. (ed.). 2011. *Librong pinagaaralan nang manga Tagalog nang uicang Castila gawa ni Tomas Pinpin*. Manila: University of Santo Tomas Publishing House.

Wylie, A. 2002. *Thinking from things: essays in the philosophy of archaeology*. Berkeley: University of California Press.