

Gold Work, Filing and Blackened Teeth: Dental Modifications in Luzon¹

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ABSTRACT

Different forms of dental modifications used to be a widespread cultural expression across much of Luzon (Philippines). Gold decorations on teeth appear in the archaeological record around the fourteenth century CE, and later Spanish documents confirm gold pegging, but also teeth filing as well as the deliberate blackening of dentitions among Tagalog and Bikol speakers. While in the immediate sphere of Spanish influence such practices were rapidly abandoned, they persisted far longer among indigenous groups in more remote locales, especially the Cordillera. The motivations behind dental modifications were complex and included concepts of beautification, achieving personhood and affirming group identity. By the beginning of the twenty-first century the practices had generally fallen into disuse, though to this date an appreciation of and familiarity with the techniques of teeth blackening is being preserved among an ever shrinking number of elders of certain indigenous groups, such as the Gaddang.

Keywords: Philippines, Luzon, Cordillera, ethnography, cultural change, dental modifications, gold pegging, teeth filing, teeth blackening, betel chewing.

1. Introduction

Among the different ways of marking the body, human teeth are an alternative canvas to skin, upon which differences can be inscribed as a way of defining individual and cultural identity. Such dental ornamentations became the most universal device of this type employed in Southeast Asia and beyond over at least the last 4,000 years (Tayles 1996; Zumbroich 2009; Zumbroich 2011).

The indigenous appreciation of dental modifications sharply contrasts with the Western attitude brought to these practices. Early European explorers of Southeast Asia were rarely intrigued, more often repulsed when confronted with filed, dyed or otherwise modified teeth. Until recently, anthropological inquiry attached the label 'dental mutilation' to the different expressions of shaped or inlayed teeth, and this derogatory term is still alive in the non-anthropological literature

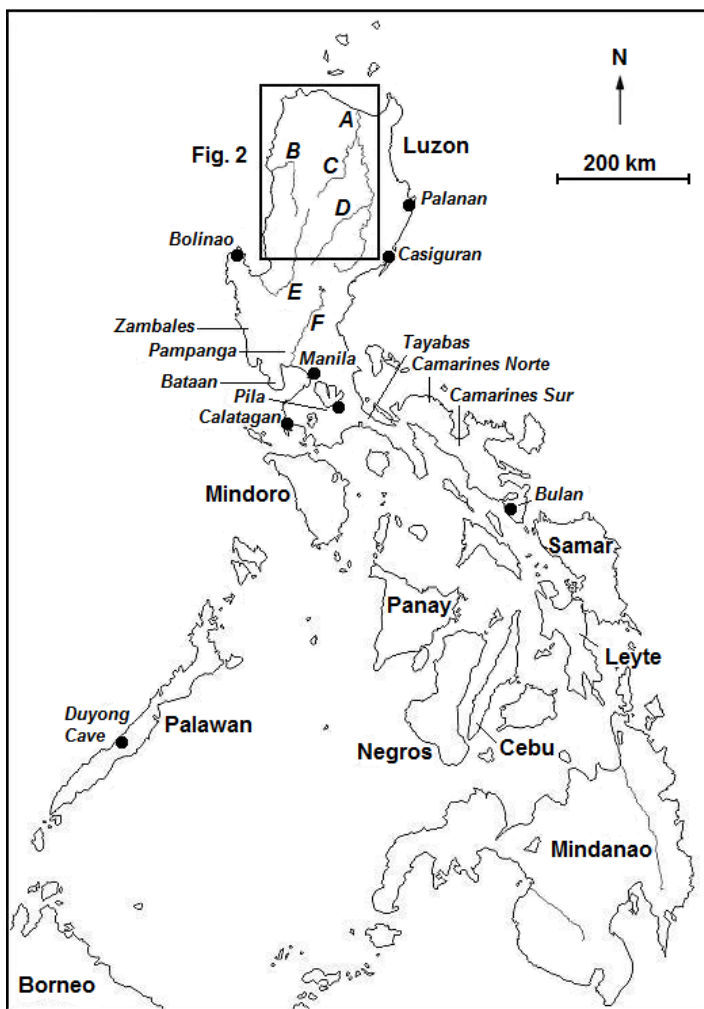


Figure 1. Philippine archipelago with the major islands and the locations mentioned in the text indicated. In north Luzon the major river systems are marked: Cagayan (A), Abra (B), Chico (C), Magat (D) and Abra (E) and Pampanga (F). Their headwaters approximately trace the course of the Cordillera mountain range towards the south.

(e.g., Romero 1970; Milner and Larsen 1991). This terminology projects images of violence, punishment, and degradation of appearance on a practice that often carried an intent of aesthetic embellishment in its original context. The Western ideal of displaying a full set of white teeth ran counter to most dental modifications, especially the blackening of teeth. The latter practice was for the longest time also conflated with betel chewing, a distinct custom that could lead to discolored teeth (Rooney 1993; Zumbroich 2008). In fact, the academic debate about whether a teeth blackening tradition is separate from betel chewing even continued into the twentieth century (e.g., Holbe 1908).

For four hundred years a frequently echoed explanation of dental modifications in Southeast Asia has been that it was a means of differentiating oneself from dogs, pigs, monkeys etc., with their white protruding teeth. The notion first appeared in 1591 in the report of the English travelling merchant Ralph Fitch about the inhabitants of Pegu (today's Bago), which was at that time the capital of the Burmese Kingdom of Taungoo:

They have their teeth blacked, both men and women, for they say a dog hath his teeth white, therefore they will black theirs (Fitch 1591, 40).

This was repeated almost verbatim in subsequent travel accounts of different locales across the region (e.g., Purchas 1613, 395; Knox 1681, 100) and resurfaced in ethnographic accounts of the Nicobar Islands, Sumatra and so forth (e.g., Man 1886, 441; Loeb 1933, 44). Indeed, in some cultures like the Balinese, local cosmology provided an underpinning for a strong aversion to animality and, consequently, to visible canine teeth (Forge 1980). Elsewhere, the reasoning that teeth were altered '*so as not to look like a dog*' appeared to be no more than an *ad hoc* explanation by practitioners or by outside observers that provided little actual insight into the cultural constructs motivating the alteration of teeth.

The island group of the Philippines (see Fig. 1) presents a rich opportunity for an in-depth exploration of the history of dental practices. On the island of Palawan, a burial site in the Duyong cave dated to about 2660 BCE, provided one of the earliest attested cases of teeth staining on human dentitions (Fox 1970, 60-65). In his report about Magellan's ill-fated expedition to the Philippines in 1521, Antonio Pigafetta gave the first eyewitness account of the gold decorated teeth of the king of Butuan on Mindanao (Pigafetta 1525, 123). In fact, to this date there are a few ethno-linguistic groups across the Philippine Islands whose members are still familiar with these once ubiquitous dental practices.

On the island of Luzon (see Fig. 2) dental modifications have been particularly frequently noted, but have not received commensurate attention in anthropological studies, especially compared to visually more complex corporeal inscriptions, such as tattoos. The present paper aims to correct this deficit by focusing on the significance of dental ornamentations as a cultural expression on Luzon. This island displays a mosaic of ethno-linguistic groups of mostly Austronesian linguistic affiliation, particularly so in its northern part. Here the mountain range

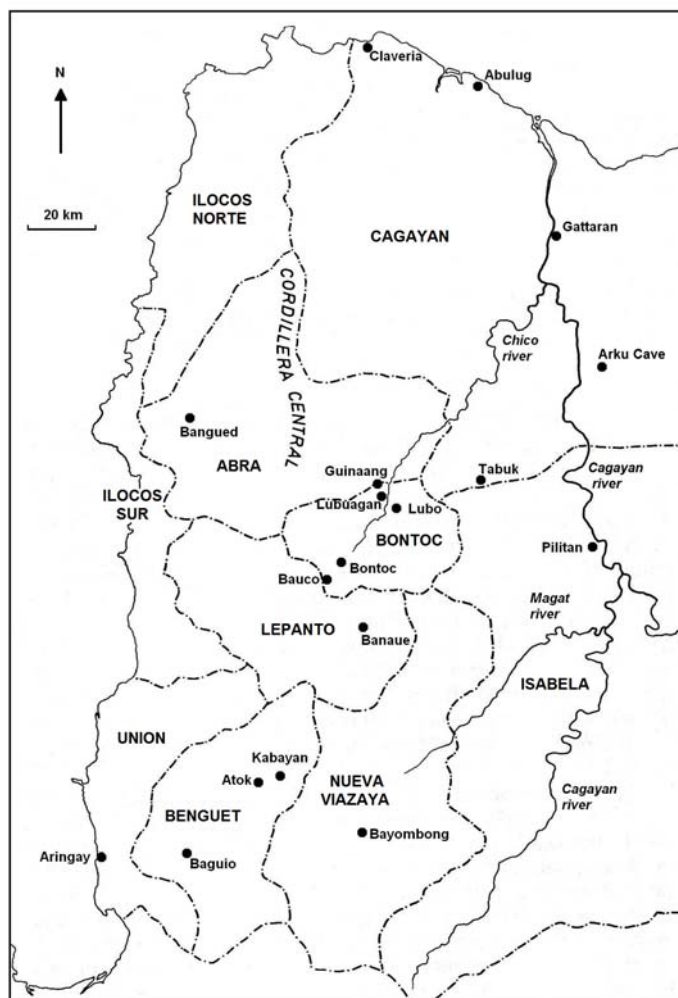


Figure 2. Outline map of the Cordillera region (see inset in Fig. 1) showing the provincial borders of 1899. Locations mentioned in the text are indicated.

of the Cordillera and associated river systems draining into wide plains dominate the landscape with a varied topography and correspondingly diverse ecosystems that gave home to a multitude of indigenous people. Covering a time period of about seven hundred years our study draws on a wide range of sources, from archaeological evidence to documentary and lexical data, oral literature and ethnographic reports, in order to illuminate the history and cultural role of dental modifications in Luzon. Particular attention will be directed at identifying the methods and the botanical resources involved, which might provide clues about the origin of the custom in the broader Southeast Asian context. We will also report some field observations from one of the few communities of the Cordillera where the practice of dental modifications or the memory thereof is still alive.

2. Archaeological evidence

The earliest evidence for dental ornamentation in Luzon comes from the archaeological record of the late proto-historic (or emergent) phase of the Philippines' chronology (Junker 1999, 387). Among the fifty one burials, which were unearthed from the fourteenth to fifteenth century CE cemetery site of Balingasay in Bolinao (Pangasinan Province), only eight had dentitions with gold ornamentations in various degrees of elaboration, usually in the form of up to nine gold pegs per tooth (see Fig. 3). Gold plugs were hammered into small, drilled holes in the teeth and ultimately took the form of a delicate point, disk or fish scale (Guthe 1934; Rittershofer 1937). About half of the dentitions, but typically not those that had gold decorations, showed evidence of filing and also staining. The fact that the discolorations were in some cases discernibly restricted to a number of frontal teeth (Legaspi 1974, 13), points towards deliberate rather than incidental dyeing of teeth.

A similar pattern emerged from a different archaeological site of the same time period, located further south in central Luzon. Among over five hundred grave assemblies that were excavated at Pulung Bakaw and Kay Thomas on the Calatagan Peninsula (Batangas Province), only one had gold-pegged teeth. Filing of the frontal teeth in different patterns was observed in over eighty percent of adult males and females (Janse 1941, 158; Fox 1959, 353-354). Around the fourteenth century these refined bodily practices apparently extended through the coastal polities of central and southern Luzon, since teeth ornamented with gold pegs in patterns that varied according to location were also found in Pila on the Laguna de Bay and Bulan at the southernmost tip of Luzon (Winters 1977, 451). The rareness of gold ornamentations and their association with prestige burial goods in the same graves (Barretto-Tesoro 2003, 307) are evidence that these ornamentations were insignia of high social

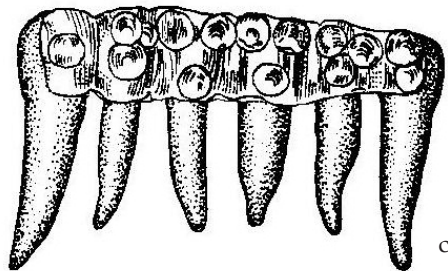
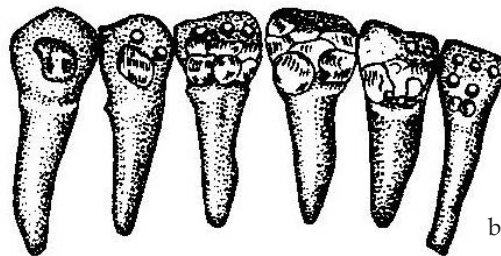


Figure 3. A skull from the cemetery site of Balingasay in Bolinao with multiple gold pegs inserted into the frontal aspect of incisors and canines (a). A detail view of a different set of teeth ornamentations with gold pegs reveals some small holes on the teeth where lost gold pegs had previously been attached (b). In another instance a solid band of gold covering the labial surfaces of upper incisors and canines was attached with gold 'rivets' (c).

status. Filed teeth, on the other hand, were not correlated with any cultural materials and hence not indicative of a social stratum, but appeared primarily correlated with age, pointing to filing as a rite of passage after puberty. Tentative archaeological evidence suggests that teeth staining might have also been practiced contemporaneously.

3. Spanish documents

With the Spanish colonization of what then became *Las Islas Filipinas*, eyewitness accounts of the inhabitants' customs initially focused on the Visayan archipelago, but extended to Luzon after the occupation of Manila in 1571. These Spanish documents were prepared by ecclesiastic and administrative officials and covered their primary spheres of influence, the central to southern coastal and lowland areas. In his meticulously detailed *Relación de las Islas Filipinas* of 1604 the Jesuit chronicler Pedro Chirino enumerated the copious gold jewelry that covered much of the body and even extended to the mouth of some of the Tagalog he had encountered in the Manila region:

They even used to, and do yet, insert gold between their teeth as an ornament... From the edge to the middle of the tooth they neatly bore a hole, which they afterwards fill with gold, so that this drop or point of gold remains as a shining spot in the middle of the black tooth. This seems to them most beautiful, ... (Chirino 1604, 177-178).²

The high level of craftsmanship that Tagalog goldsmiths had achieved was mirrored in a complex terminology. The *Vocabulario de la Lengua Tagala*, published by the Franciscan Pedro de San Buenaventura in Pila in 1613, contained no less than 122 entries on *ginto* (gold), including *pusal*, the gold pegs in teeth (San Buenaventura 1613). For the Bikol-speaking region around Camarines Sur, the Franciscan Marcos de Lisboa, another sharp observer of local customs, noted in his *Vocabulario de la Lengua Bicol* of 1609:

pasac: Ornamentation of small pieces [*granitos*] of gold, brass, or other metal, inserted in something, as for instance in a swordhilt, etc.
pasac: Gold driven into, or wrapped about, the teeth, as was the use here anciently [*antiguamente*] (Schneider 1921, 380).

This entry directly connects the tradition of gold ornamented teeth to metal working technologies perfected, e.g., in the production of ornate weapons for elite consumption. But, as noted by de Lisboa, by the beginning of the seventeenth century such public displays of wealth

had largely come to an end in the lowlands of Luzon, since indigenous people had for decades been forced under physical threats to relinquish their gold for the Spanish treasury (Salazar 1583, 222-224).

Other forms of dental modifications by the Tagalog were discussed by the colonial administrator Antonio de Morga in his *Sucesos des las Islas Filipinas* of 1609:

All are very careful of their teeth, which from a very early age they file and render even, with stones and iron. They dye them a black color, which is lasting, and which preserves their teeth until they are very old, although it is ugly to look at (Morga 1609, 78).

Tagalog had a specific implement (*panhudhod*) with which they would scrub their teeth (San Buenaventura 1613) and accomplished the actual filing (*alal*) with a stone (*panalal*), as did the Bikol (*ngudngód*, 'to file the



Figure 4. Apo Bining, a Kalinga woman from Tabuk with red-stained teeth as a consequence of long years of betel chewing.

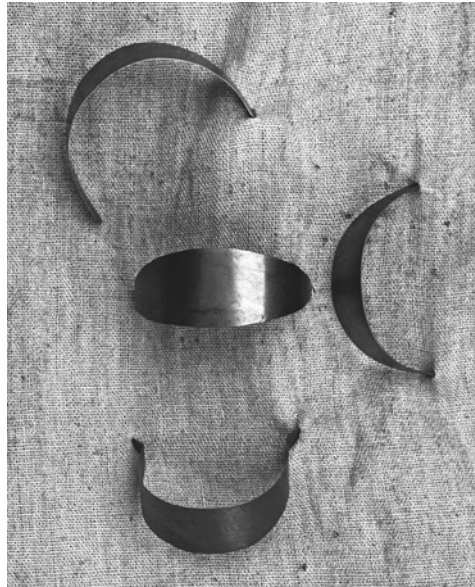
teeth down with a stone'; Mintz 2004). Pedro Chirino added to this account that the Tagalog were also "fashioning them [teeth] all to a point, like a saw" though this pattern was reserved for the less affluent (Chirino 1604, 187).

The anonymous author of the late sixteenth century Boxer Codex was the very first to point out that the Tagalog, like the inhabitants of the Visayas, often dyed their teeth red and black (Quirino and Mauro 1958, 417, 426). To blacken teeth (*itim*) required chewing a plant that was called *locmoy* in the Laguna de Bay area and *tibatib* in the mountains (San Buenaventura 1613). Marcos de Lisboa reported on Bikol that for teeth blackening they chewed the *cogollitos tiernos*, small, tender cores of the *muyá* vine which climbed up palms and other trees. Alternatively, one could chew *amlóng* 'a type of root hanging from trees in the forest', which looked similar to nascent deer antlers covered in black fur.³ *Locmoy*, *amlóng*, *tibatib* and *muyá* can all be identified as *Epipremnum pinnatum* (L.) Engl. (Araceae), a vigorous aroid vine occurring freely along the coasts or in forests up to medium altitudes across the Philippines.⁴

There were two different causes for the 'vermillion' colored teeth (Chirino 1604, 187) readily observed among indigenous people. Betel chewing was common in coastal and lowland areas as well as parts of the Cordillera (Morga 1609, 97-99; Aduarte 1640, XXXI, 34)⁵ and had the effect that "the saliva and all the mouth are made as red as blood" (Morga 1609, 98). After a number of years, the addictive habit could leave the teeth of a chewer with a distinct reddish-brown stain (see Fig. 4). In an unusual custom, some people of the lowlands also dyed their teeth red with small pieces of *lacha* (Tagalog) or *lakhá'* (Bikol),⁶ a foreign product sold in the trade district of Tondo in Manila. According to Marcos de Lisboa it was imported from China, whereas Pedro de San Buenaventura claimed that it came from (though in reality more likely *through*) Borneo. Both authors must have been referring to lac, the scarlet resinous secretion of a scale insect (often *Kerria lacca* Kerr, Coccoidea) which could be applied to the teeth after diluting or heating.⁷

All these different ways of purposefully interfering with the God-given shape and whiteness of teeth were in Spanish eyes a "barbarous practice" outside the Catholic norms of behavior (Chirino 1604, 186), reflected in the pointed gloss "whoever files his teeth, I will surely punish," in Pedro de San Buenaventura's *Vocabulario* (1613, 390). With increasing influence by Christian missionaries in the lowlands of central and southern Luzon, teeth filing and dyeing (but not betel chewing) began to be displaced during the seventeenth century and to be broadly abandoned by the early eighteenth century (San Antonio 1738, 327).

Further north, the unsuccessful Spanish quest to exploit the legendary goldmines of the *ygolotes*⁸ revealed that in the Cordillera, too, some had their teeth ornamented in gold. Don Alonso Martín Quirante's expedition of 1624 that followed the Aringay River from the north-west coast into the mountains likely made contact with Ibaloi (Nabaloi) in the area around today's Baguio. Their chiefs, he reported, "usually cover their teeth with gold so fitted as not to interfere either with talking or



a



b



c

Figure 5. Photographs taken by Dean Worcester in 1908 illustrate *chakang* ornaments (a) and their use by the wife of Mora, an otherwise unidentified Ibaloi from the settlement of Atok (b, c). In his *National Geographic* article, intended for a broader audience, Worcester spiced up the description of this jewelry with the sarcastic caption “Where silence is really golden,” alluding to the fact that wearing *chakang* made talking impossible for women (Worcester 1913, 1201).

with eating” (Quirante 1624, 270). It is uncertain how much longer this form of dental modification persisted, since no more is related about it subsequently.

By the later part of the eighteenth century a new form of gold adornment was observed in the gold mining areas along the upper course of the Agno River, particularly around Kabayan, where “the leading women place a plate of gold over their teeth, and remove it to eat” (Antolin 1971, 121). These so-called *chakang* were fitted solid gold bands covering the entire frontal aspect of the teeth, and thus interfered with both speaking and eating (see Fig. 5). Little is known about this jewelry, but it appears to have been reserved for Ibaloi women as a display of their high socio-economic status (Semper 1862, 90; Worcester 1906, 847, plate 21; 1913, 1201; Vanoverberg 1929, 239; Antolin 1970, 224). These ornaments were passed on as heirlooms from generation to generation, not to be sold except to relatives, and thus survived into the mid-twentieth century when, according to our Ibaloi informants, they were still worn during *kanyaw* (ritual feasts; see also Barrows 1956, 234).

According to an early seventeenth century document by the Dominican historian Diego Aduarte blackened teeth were common among **Ilocano** of the southwestern reaches of the Cordillera. He recounted an incident in which the voice of *Apolaqui*, the *anito* or ‘god’ of war and safe travel, was heard, warning local traders on their way from the lowlands to the mountains that “strangers with white teeth” would arrive (Aduarte 1640, XXX, 181-182). On the eastern or Cagayan side of the Cordillera, Diego Aduarte noted that around the same time the incipient Christian missionary efforts at Pilitan along the middle Cagayan River were met with similar obstacles:



The devil greatly resented their [i.e. the missionaries’] coming, and complained and uttered frightful howling through the mouths of his priestesses or *aniteras*. [...] he could not endure the sight of ‘those barbarians with white teeth’ (Aduarte 1640, XXXI, 138-139).

European missionaries with ‘blemished’ white teeth were similarly denounced by the local *Gadanes* (Gaddang; Aduarte 1640, XXXI, 139; XXXII, 42). How teeth blackening was actually accomplished in northern Luzon during this period remained largely unrecorded, except for the Ibanag who lived along the banks of the lower Cagayan River below Gattaran. They boiled iron sulphate (‘vitriol’) with sprouts of *pili* trees (here likely *Canarium luzonicum* A. Gray, Burseraceae), which probably produced a black pigment due to the presence of tannins in the branches (Gana 1916, 264; Scott 1994, 264). The actual blackening process of the

teeth was called 'firing' in a possible reference to strengthening of the teeth.

4. Ethnographic exploration

In the second half of the nineteenth century the dental modifications among the more accessible nomadic hunting and gathering Negrito⁹ groups of Luzon, living in the Zambales and Bataan provinces, attracted

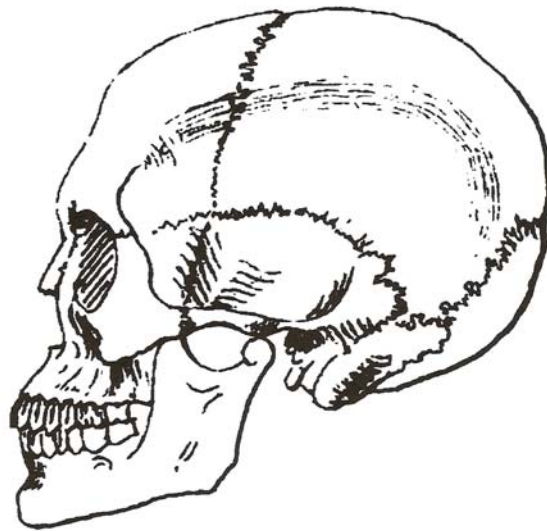


Figure 6. This Negrito skull with upper frontal teeth chipped into a sawtooth pattern was one of a dozen stolen from a Negrito burial place in the forests of Bataan Province in the 1870s by Adolf Meyer, the German anthropologist and later Director of the Royal Anthropological Museum in Dresden. He sent the skulls to Rudolf Virchow at Berlin's Charité Medical School. Their source was revealed in a later letter in which he commented on 150 skulls he purchased in New Guinea: "Here I did not have to steal them, as I did in the Philippines." (Adolf Meyer to Rudolf Virchow, 22 October 1873, in Zimmerman 2003, 168).

attention from an unlikely direction. A school of physical anthropology under Rudolf Virchow's leadership in Berlin had made craniometry an essential part of its anti-humanist program of racial analysis (Zimmerman 2001). Consequently, 'hunting' for indigenous skulls wherever and whenever possible was pursued unscrupulously and, in the case of the skull shown here (see Fig. 6), accomplished by

clandestinely disinterring and stealing it “under great danger” (Semper 1873, 363; Virchow 1873, 375). Eventually it was learned that the so-called Ayta typically reshaped the upper frontal teeth into a sawtooth pattern by means of knocking off the edges with a metal blade driven by a piece of wood. This process of *ta-li-han*, ‘sharpening of teeth’ (Reed 1904, 36, 62) was to satisfy their aesthetic concerns, and their teeth remained otherwise unstained (Semper 1873, 364-365; Schadenberg 1880, 136; Koeze 1901-1904, 182; Worcester 1906, 808, plate 21).

Towards the end of the nineteenth century a good deal of the incipient ethnography of the Cordillera region was conducted by foreign travellers, of whom many, like Hans Meyer or Alexander Schadenberg, continued to maintain strong connections to the German-speaking ethnographic establishment (Scott 1975). One of their aims was to further the categorization of the many ethno-linguistic groups hitherto subsumed under the term ‘Igorot’ by collecting physical artifacts and cataloguing characteristic ‘traits’ in photographs and written records for presentation to European audiences.

An account of non-Christianized Gaddang, living on the slopes of the Cordillera north of the Cagayan-Magat River fork, detailed the dye stuff they used for teeth blackening as well as tattooing as “rust” from their plough and “charcoal” from guava wood (*Psidium guajava* L., Myrtaceae).¹⁰ While perhaps not accurate in the details, the description identified elements, such as the iron implement and guava wood, which were confirmed by later reports on Gaddang. Notably, the guava was not native to the Philippines, but rather to the region between Mexico and Peru and had been introduced across the Pacific to the Philippines by the Spaniards, maybe as early as the sixteenth century. It became naturalized across all the islands, but was also grown in home gardens for personal consumption of the fruit (Burkill 1935, II, 1815-1817; Quisumbing 1951, 664-666) and was therefore a ready source for preparing teeth blackener.

The charring of guava wood was also employed by Bontoc adolescents to make teeth blackener (*fallai*), according to an entry in the first Bontoc-English dictionary (Clapp 1908, 165, 206). On one of his excursions across the Cordillera, the German ethnographer Alexander Schadenberg had earlier observed how married Bontoc women burned the resinous wood of the Benguet pine (*Pinus kesiya* Royle ex Gordon, Pinaceae), the dominant species of the tropical pine forests of the Cordillera, to collect the soot. This they then mixed with cane sugar juice on a special stone implement and applied it with fingers moistened in *basi* (wine produced by fermenting sugar cane juice or rice; Schadenberg 1888, [36]).

After the Spanish-American war of 1897-8, the new American administration engaged ethnographic data in its efforts to establish or tighten political control over the people of the highlands of Luzon, e.g.,

by reorganizing administrative boundaries (Finin 2006). Subsequently a handful of influential American-authored summary works appeared, aiming to streamline the systematization of the ethno-linguistic groups of Luzon with a focus on their geographical distribution. But the scant record of teeth modifications was not easily integrated into these schemes that attempted to highlight characteristics by which these groups were easily distinguished.

Dean Worcester, the American zoologist turned Secretary of the Interior for the Philippine Insular Government, offered in his review of the 'Non-Christian tribes of Northern Luzon' little information on dental modifications, except for providing the earliest photographic images of the practice that were still extant (Worcester 1906, 807, 836, plate 21). Otley Beyer's review of the population of the Philippines failed to recognize teeth modifications as an important feature of any of the indigenous people of Luzon (Beyer 1917). Finally, Alfred Kroeber incorrectly postulated that filing and dyeing teeth were a characteristic common to *all* of the Philippines, except past and present inhabitants of the Cordillera. This was part of his broad-brush, yet failed argument to delineate "Igorot civilisation" from the rest of the Philippines as being more distinctly 'Proto-Malayan' in nature (Kroeber 1919, 130-131).

At the same time, research into the indigenous people of Northern Luzon intensified as it received new impetus from purely academic studies as well as data collected during missionary work. From the resulting ethnographic studies, lexicographic works and recordings of oral literature a more accurate picture of the dental modification practices of different ethno-linguistic groups emerged.

4.1. *Tingguian of Abra (Itneg)*. In the late nineteenth century, the Filipino scholar Isabelo de los Reyes prepared the first comprehensive ethnographic report on the culture of the Tingguian, a group centered on Bangued and the Abra River valley. He particularly noted the Tingguian's extensive tattooing and teeth blackening (Reyes 1887, 12). Since tattooing and teeth blackening were also historically well-documented features of Japanese people, these similarities led subsequently to (erroneous) suggestions that that the Tingguian might be descendants of "shipwrecked Japanese or of the members of a stray Japanese colony" (Stuntz 1904, 36; Metzger 1905, 10). Further fieldwork eventually documented that the dyeing of teeth by the Tingguian was accomplished with multiple overnight applications of a mixture of iron salts and tanbark (Cole 1908, 201; 1922, 248, 305; 1929, 20). The latter was tannin-rich bark typically collected for tanning leather, but also useful for fabric dyeing and teeth blackening, since the combination of tannins with certain salts would result in dark, insoluble pigments as had probably already been employed by the Ibanag centuries earlier. While tanbark was typically a product of the trees of coastal mangrove

swamps (e.g., *Bruguiera* sp., *Rhizophora* sp., Rhizophoraceae), a more likely local source for the Tingguian was the *damokes* tree (*Pithecellobium dulce* (Roxb.) Benth, Fabaceae). This lowland tree of Central America had been introduced by the Spaniards and become naturalised in Luzon (Cole 1922, 408).¹¹ The source of the iron salts is unknown, but they were probably a trade product, maybe related to fabric dyeing.

For the Tingguian, teeth blackening was not merely a physical process of adornment, but integrated into their belief system of magic where specific rules had to be observed to guarantee the success of the operation. The dye was to remain applied only at night time and had to be removed by the first crow of the cocks in the morning, since failure to do so would result in permanently white teeth. In turn, not to have shiny, blackened teeth led to diminished social acceptance and belonging among peers in the group (Cole 1922, 305; 1929, 21).

4.2. Ifugao. The most detailed picture of teeth blackening emerged for the Ifugao, a group of wet rice terracers living on the eastern slopes of the Cordillera, with the Banaue region as one of their centers of population. Their teeth blackening was accomplished by heating chips of wood above the fire and applying the wood tar thus collected on a knife to the teeth. Besides the unidentified *teqom* tree, a plant otherwise known for its use in religious ceremonies (Conklin 1967, 236), the main source of blackening material was the tree *halihîñon* (*Eurya acuminata* DC., Theaceae). The reddish resinous substance derived from it was likened by the Ifugao to the equally reddish dye obtained from the bark or wood of the *îpil* tree (*Intsia bijuga* (Colebr.) Kuntze, Fabaceae; Quisumbing 1951, 410-411; Lambrecht 1978, 189-190; Medina 2001, 261-262). In fact, while the resin of *halihîñon* was employed to *blacken* teeth, its small stems were also simply chewed as a *momon* (here a substitute 'betel chew') and specifically "to prevent whitish tongue," i.e., to redden it.¹² Thus within the broader context of aesthetics and well-being, different parts of the plant were utilized by Ifugao to color their mouth in the contrasting, yet related colors, red and black.

To the Ifugao performing teeth blackening had, beside the aesthetic dimension, a distinct sexual connotation since it was customary for adolescent boys to court girls by presenting them with *hâlud* 'blackening resin' when they visited their *agamañ* (dormitory) at night. *Makihâlud*, 'to offer *hâlud*' (Lambrecht 1978, 190) in the form of already lit chips of wood exuding resin became a prelude to participating in pre-marital sexual relations. *Makihâlud* became hence synonymous with 'to court girls in the *agamañ*' (Barton 1938, 99; Lambrecht 1957, 173). It was so understood in an Ifugao folktale from Banaue:

[...] and her father and her mother say:
 'From whom did you get your child?'
 And Aginaya says:
 'No one I saw who came to our sleeping place
 To apply *hálud* with me'
 (Lambrecht 1957, 173, 176).

In an *Abu'wab* tale to be recited by a priest during the marriage ceremony of the Ifugao of Mayawyaw, the act of teeth blackening can be read even more explicitly as relating to sexual intercourse itself. The teeth blackening resin is deposited in the girl's mouth, found to be 'good', swallowed by her and, after later being touched on the navel, the girl becomes pregnant (Lambrecht 1935, 223; Medina 2001, 261). Due to the sexual resonance of teeth blackening, a taboo relating to exogamy existed, forbidding kin of the opposite sex to be present during teeth blackening in any context or at any time of day. This taboo was as strong as, for example, that against the use of suggestive language in the presence of female kin (Barton 1930, 279). As teeth blackening fell out of favor in the twentieth century, the lexem *hálud* lost its reference to this custom and simply came to mean 'to court in order to win sexual favours' (Newell and Newell 1958, 63; Newell and Poligon 2005, 265).

The mention of *hálud* in the *hudhúd*, a complex genre of oral literature that is inextricably connected to Central and Southern Ifugao ritual and depicts a mythological model of the Ifugao universe (Stanyukovich 2000), asserts the deep connection of teeth blackening to Ifugao culture. The inclusion of references to teeth blackening (but not to filing) in different genres of Ifugao oral literature clearly dispels the suggestion that teeth blackening was merely a practice acquired in the nineteenth century to serve as a less invasive substitute for those unwilling to submit themselves to filing (Barton 1930, 37).

4.3. Isneg (Tingguian of Apayao). The Isneg people lived in Apayao, the far northeasterly reaches of the Cordillera as it approaches the ocean between Claveria and Abulug. While for the Isneg the social context of teeth blackening remained mostly unexplored, Morice Vanoverbergh's vocabulary of the Isneg language exemplifies the diversity of their approaches in the practice (Vanoverbergh 1972).

One choice was to prepare *tangíngi*, a tarry dye stuff let to drip from burning wood onto the blade of the head axe from where it was then applied to blacken teeth. While some of the plants used for this purpose remain unidentifiable,¹³ one of the trees known to be utilized was *langká*, the jackfruit tree (*Artocarpus heterophyllus* Lam., Moraceae), of which the wood is highly lactiferous and the bark contains tannins.¹⁴ An alternative way for Isneg to obtain a black dye was to crush the leafless *xamát* vine (unidentified) or to mix the pounded bark of the

kadig tree (unidentified) with *ngilá*, 'yellow water', collected from the base of rocks. In the latter case, the reaction of a plant extract with water of high iron or other mineral content, must have formed a dye. Finally, a unique approach lay in the use of the sap of *kamíxing* (*Semecarpus cuneiformis* Blanco, Anacardiaceae) by some Isneg. This tree belongs to a genus notorious for its black and tarry, but highly irritant sap that can lead to significant injury on skin contact (Quisumbing 1951, 814), so much so that Ilocano speaking people claimed that just the air passing through the tree would poison them (Vanoverbergh 1927, 146). Surprisingly, it was in use for teeth blackening by the small proportion of people that were immune to the irritant.

The number of plant species involved not only exemplifies the depth of the Isneg ethnobotanical knowledge, but also suggests that the custom of teeth blackening had considerable time-depth, thus allowing for a diversification of approaches.

4.4. Ilongot. The Ilongot, a relatively isolated group inhabiting the Caraballo mountains approximately east of Bayombong and the southern Sierra Madre, practiced teeth filing followed by blackening into the 1970s (Vanoverbergh 1937, 915; Wilson 1947, 23; Headland 1977, 55; Winters 1977, 454; Rosaldo 1980b, 139). This was a significant life cycle event for young Ilongot as they emerged from their youth, an idealized phase of life, through a series of rites of passage. Teeth filing, for either sex, and taking a head, only for adolescent males, were two of the physically challenging ordeals that punctuated this transition into full adulthood which was eventually completed by courtship and marriage (Rosaldo 1976, 124). Sometime in their early to late teens the filing was performed for a group of adolescents on a specified date which was anxiously awaited:

Since in fact I am an unmarried young man I cannot run away from this, for all the young women are having their teeth filed as well.[...] Alas, what if it hurts as much as the others have said when they file my teeth (Rosaldo 1976, 137-138).

A piece of wood was carved for the participants to hold between their teeth in order to cope with the pain, and then their six upper and six lower frontal teeth were filed down. Afterwards a feast with *basi* and special foods was presented to the community by the parents of the youths. The treatment of teeth after the filing with the exudate of a burned twig from a guava tree or a *batac* plant (unidentified) not only soothed their pain, but also blackened their filed teeth.

The reasons for teeth filing and blackening were characterized as aesthetic: the contrast between blackened teeth and betel-stained red lips was considered attractive (Rosaldo 1980a, 268). But this alone does

not explain the ordeal of teeth filing, and a look at the attributes attached to teeth during different stages of the Ilongot life cycle shows how the ritual was integrated into a progression of symbolic images. A child's tooth tied to a *runo* grass (*Miscanthus* sp.) was, like the sprout, full of growth potential, tooth loss through filing in adolescence a promise of development, toothlessness of a mature person an expression of the bodily imperfections of a fading body and, finally, loss of teeth in dreams foretold one's impending death (Rosaldo 1980a, 152, 268).

4.5. Agta. In eastern Luzon among the Agta groups of the coastal areas of Casiguran (Dumagat, northern Aurora Province) and of Palanan (Isabela Province) some of the boys and girls had their upper incisors (and sometimes canines) filed down in late puberty, and a few had both their upper and lower front teeth filed. Whereas at the beginning of the twentieth century the filing was performed with an arrow head (Turnbull 1929, 132), later a *guho* (dull knife) was used that was eventually aided by a *kikil* (three-cornered file). By the 1970s, the only Agta of Palanan that apparently practiced teeth filing were those beyond contact, living deeper in the mountains, whereas it could still be readily observed among the Agta of Casiguran (Headland 1977; Bion Griffin 2008, pers. communication). Here the filers were typically more or less distantly related to one another, but occasionally they were from a different band or even belonging to a different ethno-linguistic group, the Ilongot, who lived in relative proximity. *Gépgép*, to file teeth, was primarily done to become beautiful, but sometimes also 'in order to become strong', implying some vague supernatural association (Vanoverbergh 1937, 915; Headland 1977, 55-61).

For Agta of Casiguran the staining of teeth occurred in different phases after their filing. Immediately subsequent to the procedure, soot was scraped off the bottom of a pot and applied with the fingers to the stumps so as to 'plug' the opened up pulp cavities (see Fig. 7). The following day, a poultice prepared from the bark of *amulong* vine (*Epipremnum pinnatum*) was placed against the newly filed teeth to soothe the discomfort, but at the same time causing temporary blackening of the teeth. Many adolescents continued to stain their teeth permanently until some time after marriage. Their motivations for *mégbanase* (teeth staining) was, just as for the filing, primarily aesthetic:

If we did not blacken our teeth, we would be an ugly sight, something sickening to behold. We would look dirty (Headland 1977, 61).

In order to create a 'purple' dye, small branches of two different plants were heated, and the expelled wood tar applied to the teeth. In the early twentieth century the following plants were recorded for this purpose:



Figure 7. Noli Bantug, an Agta girl from Casiguran, had her upper incisors filed at age 16 in September 1976. While the procedure was performed, a piece of *age* (white bark cloth) covered her mouth except for an opening for the upper front teeth. After the teeth were filed to be concavely slanted, the cut surfaces were blackened by applying soot.

tamoyan (*Strombosia philippinensis* (Baill.) Rolfe, Olacaceae), *agu* (beefwood, *Casuarina equisetifolia* L., Casuarinaceae),¹⁵ *bayabas* (guava), and *basila* (unidentified; Vanoverbergh 1937, 915). In the 1970s only *tamoyan* was documented for the teeth blackening, which had been given up entirely by the mid-1980s (Thomas Headland 2008, pers. communication).

While for the Agta of Casiguran the decision to engage in teeth blackening was an individual choice, further south among the Agta of northern Camarines and nearby Tayabas it was an obligatory rite of passage. The latter groups used the same plant, *lukmai* (*Epipremnum pinnatum*) as had been recorded for Bikol in Camarines in the sixteenth century and the Agta of Casiguran. An ebony tint of the teeth was accomplished by chewing the vine in combination with areca nut from



Figure 8. Dean Worcester took this photograph in 1900, showing an Ayta woman of Dolores (Pampanga Province) with the same chipping pattern as the skull depicted in Fig. 6.

pre-teen years on, though it took years of diligently chewing *lukmai* to achieve the desired even coloring (Garvan 1964, 46-47).

4.6. Ayta. Teeth filing was a significant rite of passage for the Ayta groups of the central Luzon region (Zambales, Bataan, Pampanga provinces). To have their teeth chipped to a sharp point represented maturity for young boys and was typically performed before they

reached their teen years (see Fig. 8). There was, however, no special formality or celebration attached to the procedure. Not to show discomfort in this traumatic process was essential and the boys were



Figure 9. The results of a life-long practice of *tubug* use are shown by two Gaddang elders from Kalakad near Tabuk, Apong Emilia (a) and Lakay Wikka (b).

instructed: “Don’t move. Be a man” (Garvan 1964, 46). To do otherwise, could result in a fine levied by the teeth filer or in being ‘held back’ for another year till the procedure would be completed. Up to the 1950s in some groups, e.g., around Mount Pinatubo, *táyad* (chipped teeth) were still the most obvious visually distinguishing characteristics of an Ayta male (Fox 1952, 373-4, plate 16; Stewart 1954, 104; Garvan 1964, 45-46).

5. Current state of the practice

“When black teeth were beautiful during our time” was a lament heard from one of our old informants in the Cordillera mountains, expressing regret that the ancient practice of adorning teeth was rarely practiced any more. By the second half of the twentieth century, tooth whitening products had generally replaced teeth blackening protocols across Luzon in response to the adoption of an aesthetic ideal of white, unadulterated teeth. We were able to identify only a few, more remote communities of the Cordillera, where the older generation has maintained the knowledge of teeth blackening methods and an appreciation of the results.

We found the practice alive among some elder Gaddang residents of Kalakad, a small settlement close to the municipality of Tabuk. These

Gaddang had originally migrated to this region from Isabela province and brought with them teeth blackening along with other aspects of their material culture, such as bead adornments and clothing (see Fig. 9). The substance used by them for teeth blackening usually originates from guava, but also sometimes from *kape* plants (*Coffea* sp., primarily *Coffea arabica* L., Rubiaceae). Short dried branches are lit and the exuding tarry *tubug* (or *lottani*) is collected on the *landuc*, an iron farming implement (see Fig. 10).¹⁶ The *tubug* is thereafter applied to the teeth with a finger. It is noteworthy that neither of the two current sources of *tubug* is a plant native to the Philippines.¹⁷ Our informants were aware of the fact that their ancestors previously relied on a different plant in Isabela, though they no longer remembered the identity of the tree or how long ago the switch had occurred.



Figure 10. *Tubug* drips from a piece of smoldering guava wood onto the *landuc* from where it will be dabbed on the teeth with a finger.

According to our Gaddang informants teeth staining is traditionally a daily practice of either sex, learnt by some during childhood from parents, peaking before marriage, but continuing into old age. Even after a person's death, before the funeral and in preparation for *kalekay*, the afterworld, teeth might undergo diligent blackening. The motivations for the procedure were reported as two-fold: On the one hand, it reflects the Gaddang concept of *napia* (beauty), according to which their black teeth, especially when complemented by women's elaborate beadwork, are a means to become more attractive (see Fig. 9).

On the other hand, teeth blackening serves to 'make the teeth stronger' and acts as a preventive measure against the actions of the toothworm (*tutuk*). The toothworm is thought to be found in the rice fields or forests and, after entering the mouth, slowly eats the teeth, causing toothaches and cavities.¹⁸ Until a few decades ago the techniques of teeth blackening were taught by the *mantutubog*, a resident dental practitioner, who would perform and teach teeth blackening for a fee. Occasionally the *mantutubog* would also travel, e.g., to the location of a *budong* (peace pact) ceremony between different villages, and offer his services as a teeth stainer to other people. In this way, he was likely responsible for the diffusion of the practice (and perhaps of the term *tubug*) in the region.

With the increased exposure of younger community members to non-traditional concepts of beauty through schooling and work outside the community, TV or religious influences, blackened teeth as seen among the older generation are now increasingly seen as a disfigurement or as 'dirty.' In the view voiced by an outsider to the village of Kalakad, black teeth belong to people that 'have killed' or 'practice witchcraft.' Confronted with these new prejudices, some that previously blackened their teeth have felt compelled to remove the black coating from their teeth by scraping and polishing with fine sand, while others have considered replacing their black teeth with white dentures. Hence, by the first decade of the twenty-first century the once widespread practice of teeth blackening has become nearly extinct even in the more remote parts of the Cordillera.

6. Discussion

6.1. Gold ornamentation. The appearance of gold objects in Luzon was a consequence of the socio-political evolution of chiefdoms inhabiting the coastline and lowland river valleys during the first half of the second millennium CE. A deeper involvement of these socially stratified societies in profitable long-distance trade on the one hand and increased inter-polity competition on the other hand, led to greater demand for and display of prestige goods (Junker 1999, 21-24). In Luzon the development of a craft industry in gold smithing was aided by the substantial domestic mining resources located primarily in the Cordillera and controlled by the interior societies. There is evidence that expert workshops were part of the chiefly compounds (e.g., Salcedo 1570, 102-103), and this would have given metal workers the opportunity to apply their skills to adorn the teeth of their patrons. Within this context, gold-decorated teeth emerged next to jewelry and clothing in the fourteenth century as a permanent mark of social distinction for the *datu*s (chiefs) or wider elite. Gold ornamentation of teeth was also practiced by members of the ruling class in other Southeast Asian political entities, e.g., in Celebes and

Sumatra (Gervaise 1701, 79-80; Marsden 1784, 47), but with a less elaborate expression than in the Philippines. Here the intricate and regionally differing patterns on inlaid teeth (Winters 1977, 451) raise the possibility that the message inscribed with gold inlays was more complex than so far deciphered.

The Spanish conquest disrupted the trade pathways with the gold mining areas of the Cordillera on the one hand and with long-distance trading partners on the other. In addition, the demand to pay tribute to the Spaniards in gold likely stifled overt displays of wealth like gold-pegged teeth among the elite of the lowlands. Here the custom was abandoned by the seventeenth century, but survived longer in the Cordillera where Ibaloi women of high socio-economic status wore gold ornaments, *chakang*, on their teeth into the twentieth century. Around 1900 *chakang* made from copper were also recorded, and the existence of a less precious version might indicate that these ornaments had lost some of their significance as a marker of social standing (Moss 1920, 217).

A different form of gold decorations, reflecting an otherwise lost tradition, was fashionable in Manila at the beginning of the twentieth century: Small, removable pieces of gold plate were designed by jewelers to cover the labial surface of a tooth, and one or more of these devices, either owned or borrowed, would be worn on special occasions (Guthe 1934, 11-12). In the Cordillera, gold crowns placed visibly on frontal teeth have remained popular to this date, with the requisite precious metal often originating from melted down heirloom jewelry or coins.

The theme of gold visibly placed in the mouth can ultimately be interpreted as an attempt to connect the individual to cosmological forces. Gold as a locus of power and a connection to the supernatural is well-documented for different cultures in Southeast Asia (Ellis 1981, 242; Rodgers 1988, 63-67). Among the Bagobos of Mindanao golden teeth were, besides infinite size and white color, one of the identifying characteristics of *MELÚ*, the creator of the world (Cole 1913, 135). There are also indications from the early Spanish period that in northern Luzon the power of gold was invoked in ritual processes when it was worn as a charm during a mourning period or placed in sacred shrines (Aduarte 1640, XXX, 193, 289). Up to this date, among animist Kalinga a gold earring in the highly preserved *ling-ling-o* shape is rubbed on the cheek of a child to impart healing energy. All this supports the conclusion that the spiritual forces assigned to the precious metal were a possible motive for wearing gold in one's mouth.

6.2. Teeth filing. Archaeological evidence complemented by later Spanish reports confirms that the filing of teeth was common in areas of central and southern Luzon from at least the fourteenth century into the seventeenth century. Among the Negrito groups of Luzon some, but

definitely not all that were studied in the twentieth century practiced teeth filing (Headland 1977, 56). Filing teeth into a sawtooth pattern prevailed among the Ayta in western central Luzon, whereas east of the Cordillera some Agta groups filed their upper front teeth flat. The Ilongot, living in relative proximity to the Agta of Casiguran, were the only non-Negrito group in Luzon for which the custom was briefly documented in an ethnographic study. It is doubtful that the practice has survived anywhere in Luzon to this date.

Especially the distinctly patterned filing of the Ayta expressed ethnic identity, whereas elsewhere aesthetic ideals had been constructed around filed teeth. The suggestion that filed teeth served as an insignia of a specific societal stratum, as appeared to be the case for Visayan 'warriors' of the mid-second millennium CE (Junker 1999, 348, 365), finds little support in Luzon. The significance of teeth filing as a life cycle event signifying the transition to adulthood might have preceded the fourteenth century. It was found to be most ritualized for young Ilongot males whose teeth filing was embedded in an ideology of personhood that demanded a series of severe tests of manhood (Rosaldo 1980b, 139), the survival of which signified their arrival as an adult. A classic Freudian interpretation that ultimately equates tooth loss with castration as an issue to be dealt with by boys, has been suggested for the process of filing (Rosaldo, 1980a, 268). This reading leaves unexplained the fact that more often than not, among the Ilongot and Negrito, the filing was not restricted to males, but equally applied to females.

6.3. Teeth blackening. The most common form of dental modification in Luzon, as elsewhere in Southeast Asia, was the blackening of teeth. The earliest Spanish reports leave no doubt that most of the indigenous people they encountered in Luzon in the sixteenth century had teeth dyed in black and sometimes red. To establish the time-depth of this practice in Luzon, archaeological findings have not provided much guidance, since they are not only limited, but dental stains from archaeological contexts are difficult to interpret, primarily due to possible interference from soil contamination, taphonomic issues or other habits (like betel chewing, see below). For tattooing, an identity marker popular in the Cordillera to this date, historical linguistics (with some support from archaeology) has led to the conclusion that knowledge of the practice probably entered Luzon with Austronesian-speaking migrants more than 4000 years ago.¹⁹ Linguistic analysis of the terminology of teeth blackening in the Philippines has not generated conclusive data, since only a limited number of forms referencing the material culture, process or result of teeth blackening have been recorded, with few cognate terms among them. Consequently, no linguistic reconstructions can be put forward to shed light on the origin of the practice in Luzon.

While it is currently impossible to determine the time-depth of teeth blackening in Luzon, some aspects of its material culture do tie it to the broader Southeast Asian tradition. *Epipremnum pinnatum* stands out as the only native botanical resource in Luzon that was widely employed for teeth blackening by different ethno-linguistic groups. This vine was used for the same purpose across the Philippines (e.g., Conklin 2007, 290-291), but also in other regions from Taiwan to Java (e.g., Rumphius 1747, 489) where it was known at least as early as the 10th century (Barrett Jones 1984, 55). Further comparative work on the regional methodologies of teeth blackening across Southeast Asia are likely to reveal patterns that relate the diffusion of the custom to historical trajectories, like the migration of Austronesian speakers, which, in turn, will also shed light on its early history in Luzon.

To accomplish blackened teeth, the people of Luzon, much like indigenous groups across Southeast Asia (Zumbroich 2009), drew on a wide range of ethno-botanical resources that reflected the ecological diversity of the island from tropical lowland vegetation to high altitude pine forests. Sometimes a part of a plant was simply chewed or its resin directly applied, but often the generation of the dye required some processing. Frequently, different kinds of wood were burnt and the exuded, black tarry or resinous substance utilized. In some cases, a mineral component ('yellow water', vitriol, rust) was combined with plant extracts containing tannins to form a dark pigment dye. The material culture of the practice mirrored an approach common across Southeast Asia: The blackener was collected on a broken shard of rusted iron or a rusty iron household tool, which might have (chemically) contributed to the formation of pigment dyes. As an unusual exception, some Bontoc and Kalinga used a dedicated small stone mortar to prepare the blackener (Schadenberg 1888, [36]; depicted in Meyer & Schadenberg 1890, 20a, plate 16/fig. 14).

The involvement of non-indigenous resources demonstrates how the practice went through adaptations over time. The use of lac for teeth blackening was likely introduced from Indochina where it was traditionally employed during one step of the complex staining protocol (Huard 1951, 202). Since this product had to be procured through long-distance trade, it would have restricted the practice of reddening teeth to those with access and the necessary means. The guava tree became a readily available source for teeth blackening material, after it had become naturalized, thus reflecting an adaptation of technologies to the post-contact ecology of Luzon. While *Psidium guajava* was never used for teeth blackening in the Americas from where it was introduced to the Philippines, its use elsewhere in Southeast Asia for this purpose is attested (Zumbroich 2009, 387), raising the possibility of a diffusion in either direction.

Similar to teeth filing, individual ethno-linguistic groups associated blackening with different cultural constructs, such as achieving personhood or improved aesthetics. Beautification through teeth blackening was in some cases a female domain, as in the case of Kankanaey women who also intentionally blackened their lips,²⁰ but often was not a gendered practice. As widely as the dyeing of teeth was practiced, it could have hardly played a significant role in ethnic identity formation in pre-contact Luzon. Only with the arrival of light teethed colonizers could teeth take on a new role: For both the Spaniards and indigenous people the barbarousness of 'the other' was elaborated by the difference of appearance in their teeth. Ultimately, Spanish authority, underwritten by Christian beliefs, was able to curtail the practice of teeth blackening, initially in coastal areas and the lowlands, but eventually also across most of the Cordillera. In a reversal, members of a Negrito group reported in the early twentieth century that their blackened teeth meant to differentiate them from 'Filipinos' whose teeth were kept white by then (Garvan 1964, 46-47).

Betel chewing and teeth blackening were two separate, yet closely related customs sharing various characteristics, beyond their effect on coloring the oral cavity (Zumbroich 2009, 393). Among Ifugao youth the offering of *hālud*, teeth blackener, to initiate sexual relations, mirrored the practice of offering a betel quid to intensify social (and sometimes sexual) relations (e.g., Stöhr 1981). The Agta of Camarines actually amalgamated the two practices by chewing *lukmai* vine with areca nut to blacken their teeth. In the Bikol language of the seventeenth century there was semantic overlap where the form *rumpi*' described the colours of mouth and lips caused by chewing either 'red' *buyo* or 'black' *amlóng* (Mintz 2004).

In fact, color symbolism provides an explanatory framework to better understand the complementary roles of betel chewing and teeth blackening as markers of the transition from youth to adulthood. Enhanced red of the oral cavity, lips and sometimes even the face, offset against permanently blackened teeth was a visual feature expressed by a number of different ethno-linguistic groups in Luzon. For example, married Kalinga women around Guinaang ('*Guinanes*') blackened their teeth to contrast with their cheeks, chin and forehead, which they reddened with a clay like red paste (Meyer 1885, 301; Schadenberg 1887, 149; Cole 1909, 345).²¹ Such deliberate juxtaposing of red and black is a theme that can also be located in beadwork, fabrics and other adornments, where it was often supplemented by the colors white and yellow. The color red frequently articulated youthfulness, masculine vigor and passion.²² For the people of the Cordillera it can be even more broadly associated with upper world qualities. Black, on the other hand, was seen as representing femininity, passivity, lower status and death, ultimately the underworld (Richter 2000, 245). The exuberant vitality of

a young person displayed through his or her red mouth was tempered by the blackness of the teeth, thus accomplishing an equilibrium suitable to a full member of society. Expressions for blackening such as 'firing' of the teeth (Ibanag) or transforming teeth from raw to 'fully cooked' (*lútu*, Agta of Casiguran) can perhaps be read as synecdochically referring to the whole person who, by virtue of the process, became a mature adult ready to get married.

On a more literal level, the 'firing' of teeth implies a notion of strengthening them and, indeed, evidence for such a role of teeth blackening comes from different directions. Early Spanish observers of Luzon interpreted the purpose of teeth dyeing as a form of dental protection, presumably in recognition of the noticeably better state of dental health among indigenous people compared to the typically miserable state of European teeth at the time. There is evidence from the Tagalog vocabulary that dental hygiene was traditionally considered important, but teeth blackening appears to have also played a role in facilitating dental health. Especially after teeth filing there was a need to seal the pulp cavity, and this was dealt with by applying a resinous blackening agent, similar to a 'filling.' Even the regular, sometimes nightly application of teeth blackener sealed the teeth surfaces mechanically with a thin layer of the respective material.

Indigenous testimony from different locales, including Luzon (see above), has repeatedly claimed that teeth blackening agents provided *specific* protection against tooth decay. A number of studies on the incidence of caries or the antibacterial action of teeth blackening agents have given some credence to this notion (Zumbroich 2011). In the Cordillera, the leaves of the guava tree were traditionally employed by people to 'brush' and refresh their teeth. Indeed, microbiological studies have confirmed that an extract of guava leaves has activity against plaque forming bacteria (Limsong *et al.* 2004; Gutiérrez *et al.* 2008, 6; Razak *et al.* 2006). Our own preliminary *in vitro* experiments have found that *tubug*, the teeth blackening material prepared in the traditional fashion from guava wood, exhibits biological activity against the growth of *Streptococcus mutans*, one of the key plaque forming bacteria. The documented antimicrobial activity of at least some teeth blackening preparations against cariogenic bacteria therefore provides a scientific rationale for the indigenous notion that teeth blackening contributed to oral health.

7. Conclusion

In Luzon, various forms of inscriptions on human teeth have marked different types of identities for at least the last seven hundred years. The appearance of gold ornamented teeth among Luzon's elite related to

socio-cultural developments in the early second millennium CE. The complex patterns of gold ornamentation on teeth might have reflected individual artistic expression, regional ethnic mapping or other dimensions, as a future reappraisal of the archaeological evidence in greater detail might reveal. The filing and dyeing of teeth in Luzon were pre-contact practices with strong parallels elsewhere in the Philippines, Southeast Asia and beyond. Unlike other cultural practices, like tattooing, for which the introduction has been tied to Austronesian speaking migrants of the neolithic, the case for such an early single origin of teeth blackening in Luzon, lacks support for now. The methodologies of teeth blackening were locally specific and over time underwent adaptive changes in response to newly available resources like introduced plants. Similarly, shifts occurred in the interpretation of teeth blackening under changing circumstances, like the arrival of colonizers whose teeth were not dyed. For some cultures of the Cordillera the associations of betel-red and blackened teeth provide a framework in which the coloring of teeth can be understood to represent the transition from youth to mature personhood. There is also evidence that teeth blackening agents contributed in different ways to oral health: Mechanically by sealing the teeth, especially after teeth filing, and pharmacologically by exhibiting antimicrobial activity. This combination of medical utility and diverse symbolic meanings might have been an important factor in the broad diffusion of the practice of teeth blackening.

While dental modifications had undergone numerous transformations in response to political and social and other changes for hundreds of years, more recent developments seem to have nearly extinguished the practices. The adoption of an aesthetic ideal of uniformly white teeth and the introduction of non-traditional institutions of dental care in indigenous communities, has increasingly prevented younger people from adopting teeth blackening. As the traditional knowledge surrounding the blackening process is fading with elder members of the community, so are the chances for a possible revival of the practice.

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who also provided Fig. 7, and Bion Griffin (University of Hawai'i) for sharing information based on their experience with different Negrito groups. Lawrence Reid (University of Hawai'i) helped with linguistic data and Brian Stross (University of Austin) with critical reading of the manuscript. Fig. 2 based on Jose Algue's *Atlas de Filipinas* of 1899. Fig. 3A with permission by Neal Oshima (Manila), 1995, the copyright holder, Fig. 3B from Legaspi (1974), 9-10, with permission from the copyright holder, the National Museum of the Philippines, Manila. Figs. 5 and 8 are courtesy of the Museum of Anthropology, University of Michigan, Worcester Collection 10N033, 10N013, 10N012, 01H014. Fig. 6 was redrawn by Thomas Zumbroich based on Virchow (1873, 374). Fig. 7 by Len Whalley and Thomas Headland, copyright Thomas N. Headland, 1976. Figs. 1, 2 by Thomas Zumbroich., figs. 4, 9, 10 by Analyn Salvador-Amores in 2003.

NOTES

1. This is a revised and updated version of a paper that appeared in *Studia Asiatica* (2009), vol. 10, pp. 125-165. Author for correspondence: Thomas Zumbroich, 2409 Arpdale Street, Austin TX 78704-3818, USA; email: zumbroich@yahoo.com.

2. According to Scott (1994, 196) and Javellana (1999, 418-421) Chirino is speaking of Tagalog here.

3. *Ga'amlóngan*, 'a deer with antlers which are just beginning to appear' (Mintz 2004), likely referred to the pubescent dark brown appearance of the clasping and feeding roots of *Epipremnum pinnatum*.

4. *Epipremnum pinnatum* is a highly variable species, widely distributed from Bangladesh across Southeast Asia to the Cook Islands (Boyce 1998, 201-5). Dozens of botanical synonyms exist across the biogeographical region of Malesia, causing considerable confusion. Cultivars have become some of the most commonly grown house plants, known as 'Pothos vine' or 'Devil's ivy'. The identification of *amlóng* is based on its description and the vernacular names listed for *Epipremnum pinnatum* in Merrill (1923, 175-178).

5. The cooler climate at higher elevations of the Cordillera limited the cultivation of the areca palm, requiring betel chewers to rely on traded areca nuts.

6. Both are loan words that arrived with the material, though their ultimate source was an Indo-Aryan language (Laufer 1919, 476).

7. The ability of lac to dye teeth is due to the lac pigment (laccic acids) in a base of highly adherent lac resin. Support for our identification of lac comes from Ignacio Francisco I. Alcina's writing about *lacha* in the Visayas where he described a domestic source from red ants (Alcina 1668, I, 523, II, 222). Ants as the source of lac were discussed in Chinese texts of the fourth century CE, and the notion survived into the early European herbals of the seventeenth century (Laufer 1919, 475-478). For a discussion of red woods and red lacquers, see Schafer 1957.

8. The early Spanish term *ygolotes* (later *ygorrotes*) derived from Tagalog *i-golod*, 'people of the mountain.' It initially just referred to the gold trading

mountaineers of the west Cordillera, but then became a collective term for all indigenous people of the high south and central Cordillera (Keesing 1974, 11; Scott 1974, 2-3). The meaning and connotations of 'Igorot' have shifted much over time, and we avoid the term here.

9. The ethnonym *negrito*, introduced by the Spaniards into Tagalog in the sixteenth century, is descriptive of their phenotypically differing features and not understood pejoratively. For the distribution of Negrito groups in Luzon in the early twentieth century, see Garvan 1964, updated in Headland 2003, 9.

10. The translation by the Austrian Ferdinand Blumentritt, who himself had never visited the Philippines, provided the conduit for this ethnography written by the Filipino José de la Campa 1884, 53.

11. Spanish *guamúchil* became Tagalog *kamachile* and Itneg *damokes*.

12. Ifugao also employed *kala dial* (*Alectra arvensis* (Benth.) Merr., Scrophulariaceae) and *guimu* (*Vaccinium whitfordii* Merr., Ericaceae) as a medicine to prevent 'white tongue' (Conklin 1967, 227; Reis Altschul 1973, 194, 215, 273).

13. *Alumbá* 'small shrub with elongated leaves and edible green fruits full of small stones that grows on the banks of streams'; *ingálaw* 'common small thorny shrub'; *balásig* 'small forest tree' (Vanoverbergh 1972).

14. For its traditional use in textile dyeing, see Habal and Guzman 2003, 52-53.

15. A large evergreen tree of coastal planes and low altitude with a high content of tannins primarily in the bark. Its wood tar was also employed by Isneg as a dye for tattooing. The bark continues to be used in traditional textile dyeing to generate a brownish maroon colour (Quisumbing 1951, 209-210; Vanoverbergh 1972, 369; Habal and Guzman 2003, 18-19).

16. The same process using guava wood was employed by the Kalinga of the upper Chico River and known as *tubug* (Mangali-Lubo area) or *beasig* (Lubuagan area; Galang 1941, 427-428).

17. The coffee plant (*Coffea arabica*) was only introduced in 1740 by Spanish missionaries as a plantation crop from Java to Batangas in southwestern Luzon, from where it was distributed farther (Ukers 1922, 728).

18. The toothworm as the cause of dental decay was a concept known from cultures around the globe and first described in Mesopotamian texts of the early second millennium BCE. For the Philippines, see Cole 1922, 409 and Kohlen, with a traditional treatment for the toothworm on Siargao, Mindanao (1992, 198-200, 242).

19. Tattooing is considered part of the cultural repertoire of proto-Austronesian speakers that migrated from Taiwan to Luzon (proto-Austronesian reconstruction **beCik* = tattoo). Across northern Luzon tattooing is referenced by cognate terms, e.g., Ilokano *baték*, Kankanaey *bátek*, Bontoc *fátek*, Ifugao *bátok* or Kalinga *batok* that reflect a proto-Northern Luzon **bátek* (Clapp 1908, 165; Vanoverbergh 1933, 73; Blust 1970, 118; Lambrecht 1978, 62-63; Lawrence Reid 2009, pers. communication). Archaeological support for an early presence of tattooing in northern Luzon comes in the form of horn tattooing chisels unearthed in a Neolithic burial assembly of the early first millennium BCE in Arku cave in the western foothills of the Sierra Madre mountains (Thiel 1990, 243, 260; Bacus 2004, 264).

20. The Kankanaey of Bauco used *ládoK* ('black'), the fruit of *balláy* (*Gunnera macrophylla* Bl., Gunneraceae) for teeth blackening which they linguistically distinguished from '*seppá*', blackening (of the lips), accomplished by chewing *bioksó* 'bamboo inflorescences' (Vanoverbergh 1929, 200; 1933, 64, 90, 257, 413).

21. A similar practice still exists among the Kalinga of the Lubuagan area who use the dye extracted from the fruits of *aswete* (*Bixa orellana* L., Bixaceae, 'lipstick tree'), to redden their cheeks.

22. The *liget* (anger, energy, envy, heat) of the Ilongot was closely associated with the color red, see Rosaldo 1980b, 44-49. On Kalinga color symbolism, see Jules de Raedt 1989, 23, 34.

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