

Osteological Assessment of a Seized Shipment of Modified Human Crania: Implications for Dayak Cultural Heritage Preservation and the Global Human Remains Trade

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ABSTRACT

The Royal Malaysian Customs Department seized 16 human skulls in 2005, which were acquisitioned by the Sarawak Museum (Jabatan Muzium Sarawak) in 2015. This paper analyzes the osteology of these skulls in terms of demographics, preservation condition, taphonomy, pathology, and post-mortem modifications. It then contextualizes the osteology of this collection in terms of the history and ethnography of Dayak 'trophy skull' modifications, and how such remains were modified for intended export and sale as part of the global human remains trade. In light of our osteological study, we find that peri- or post-mortem taphonomic modifications, and evidence of pathology and trauma are all relatively minimal. The diverse engraved motifs and other decorations found on these remains are not consistent with the historic Dayak 'trophy skull' trade. Instead, they are more likely a part of the newer online trade in human remains, where human remains are modified (as these ones are) to look as if they have an older Colonial-era provenance. Online trafficking of human remains, especially when modified to look as if they were produced or used by an Indigenous culture, represents a growing threat to human heritage. The identification of recently-modified material is only possible when confiscated assemblages, such as these, are made available for study.

Keywords: *Engraved skulls, Dayak, illicit trafficking, Sarawak Museum, osteology, provenance research, taphonomy.*

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INTRODUCTION

Today numerous parties, including museum curators, descendant communities, law enforcement and forensic anthropologists increasingly recognize both the historical realities of Colonial-era human remains collecting, as well as modern-day online trafficking. This paper discusses the osteology, known history and socio-legal context of a unique assemblage of modified human crania seized by the Royal Malaysian Customs department in 2005 before they could be exported. Some of the details of this seizure were not communicated to curators when the assemblage was acquisitioned by the Sarawak Museum (Jabatan Muzium Sarawak) in Kuching. The assemblage was in the process of being sent to Australia when they were seized by the Royal Malaysian Customs department in Sarawak. The Sarawak branch of the department asked for guidelines from the Federal branch in Putrajaya, specifically, what should be done with the seized skulls. The Federal government responded that they should be sent to the Sarawak Museum, which subsequently received the batch in 2005. They have been curated by the Ethnology division of the museum since acquisition for purposes of conservation, but were not registered until October 2015.

Too often, concerned parties only learn of human remains being trafficked once they have already entered the market, and then usually only if someone happens to be looking in the right place at the right time to notice when the remains in question “surface” (first appear for sale on or offline). This paper gives a glimpse of the loss to human culture that the trade in human remains causes through a unique case study. It has permitted us to osteologically assess and contextualize human remains seized in transit before they reached their (currently unknown) buyer.

In October 2015, one of the authors (AG) was the first to assess the remains in question, complemented by more in-depth osteological analysis by DH in October 2018. As will be discussed below, it was initially suspected that the most likely provenience of at least some of the crania is the northwest of West Kalimantan province, somewhere between Pontianak and the Sarawak border (see Figure 1). Examining the area demarcated by the red circle in figure 1 in Google Maps also indicates several major and minor roads on which smuggling could occur, including two that cross the international border (Jl. Dwikora/Jalan Serikin and Jl. Lintas Malindo/Jalan Serian-Tebedu). The 16 crania and half-crania in the assemblage had initially been cleaned by Sarawak Museum staff. Most of the crania ‘appeared old’, possibly because they had been placed either into the soil or left exposed on the ground for some time after being carved and ‘processed’. Within the assemblage (Figure 2), only three skulls retained their mandibles, attached to the skull by a ligature of rattan fibers.

Here, we present age and sex estimates, as well as an assessment of pathology, trauma, taphonomy, and cultural modifications seen in the assemblage. Presenting such data in its socio-cultural context advances the interdisciplinary study of the human remains trade and shows how osteology can unveil aspects of the life history of remains seized off the market. Given the unclear provenance, provenience and age of the assemblage, the data presented below will benefit law enforcement, museum curators and Dayak descendant communities who each have a vested interest in seeing this trafficking curtailed. The data and photographic documentation presented in this paper can also serve as a guide to illustrate what law enforcement, civilian curators and forensic anthropologists should look for where suspected Dayak modified ancestral remains are seized, particularly where this might warrant further assessment in advance of a possible prosecution. In the broadest sense, this research is also part of global efforts to understand the private collection of known or alleged Indigenous human remains in both the Colonial past and digital present (e.g., Valentin and Rolland 2011; Houlton 2018; Houlton and Wilkinson 2016, 2018; Watkins et al. 2017; Seidemann et al. 2009; Schultz et al. 2019).

Minimal osteoarchaeological research on trafficked Colonial-era modified human remains, let alone suspect forgeries made from unprovenienced crania, has been conducted globally (e.g., Bonogofsky 2011; Douglas

and Stodder 2006). In much the same way a forensic anthropologist would analyse unprovenanced or otherwise unidentified remains secured from a crime scene, an integrated approach is needed when assessing human remains seized with minimal, or potentially falsified, documents, if we are to better understand who was collected and when, how crania were decorated and curated: their original burial or storage conditions, and whether the individual remains were modified for sale or re-sale.

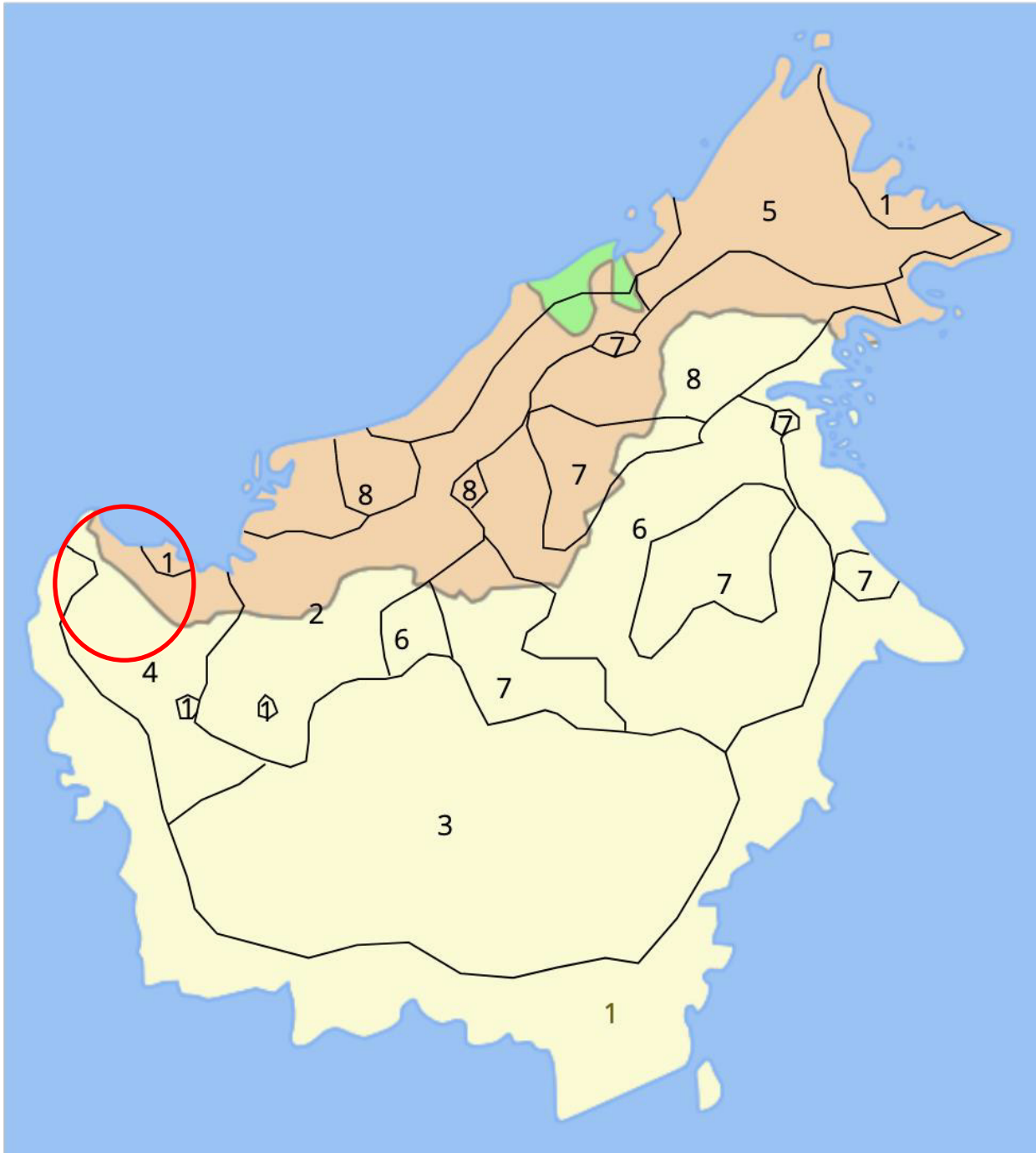


Figure 1: Map of Borneo showing Malaysian Sarawak, Sabah, Brunei Darussalam, and Indonesian Kalimantan. Colour: existing national borders. Legend: 1. Malay groups; 2. Iban and Ibanic groups; 3. Ngaju and Barito groups; 4. Bidayuh groups; 5. Dusun and Northeastern groups; 6. Kayan and Kenyah groups; 7. Basap/Lebbo' groups; 8.

Central-Northern groups. After Soriente and Inagaki 2012. Red circle: Region most likely to be the source of the seized crania. Base map from Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Borneo_blank_map.svg).



Figure 2: The assemblage of crania and half-crania laid out in the working room at the Sekama storage facility, maintained by the Sarawak Museum. One cranium is not visible (photograph courtesy of AG, October 2015).

CONTEXT

The widespread use and poor regulation of the internet and social media continues to allow human remains to be trafficked across several platforms, including Facebook, Instagram, eBay, Marktplaats.nl, etc. This is despite efforts by both civilians and law enforcement to document and control it (Graham and Huffer 2020; Halling and Seidemann 2016; Huffer and Chappell 2014; Huffer and Charlton 2020; Huffer and Graham 2017; Huxley and Finnegan 2004; Killgrove 2016; Kim 2012; Seidemann 2017; Vergano 2016). In today's online market, as in the Colonial past, modified skulls, or crania from a variety of Indigenous cultures are highly sought-after. These include allegedly authentic examples taken from 'enemies' or heirloomed from 'ancestors' from the Dayak of Borneo, the Asmat of West Papua (Indonesia), the Iatmul (Sepik River region, Papua New Guinea), the Mundurucu (Amazonas, Brazil), and *tsantsas*, or "shrunk heads" of Chicham language speakers, such as the Shuar, Achuar, Shiwiar, Wampis and Awajun of Ecuador and Peru. Given the rarity of authentic examples (i.e., produced by Indigenous communities in the 1800s-mid-1900s and used for culturally-mandated purposes before entering the market through sale, barter, or theft) surfacing on today's online market with no discernable ownership history, it is likely that numerous forgeries circulate as well.

From the mid-1800s to mid-1900s especially, numerous Indigenous peoples voluntarily participated in, or were forcibly incorporated into, Western cash economies. Thus, new opportunities to use or re-use ancestral remains within nascent 'curio' markets surfaced (Houlton 2018; Houlton and Wilkinson 2016, 2018). In many instances, curators, officials, and academics sought to place these remains into Western museums, but

simultaneously, private collecting became fashionable for the wealthy, well-traveled or well-connected to assemble personal ‘Wunderkammers’, or ‘cabinets of curiosity’ filled with mementos of the travels to exotic lands they, or their relatives or associates, had undertaken (Amsel-Arieli 2012). This collecting also frequently involved human remains taken from a variety of locations and cultural contexts, either for display or to expand a museum’s osteology collections (Spennemann 2006). Sometimes, these remains were collected purely as a form of white settler community recreation (Rudisuela 2020). In some instances, collecting the dead was also connected to “collecting” the living in the form of “human zoos” (Boëtsch and Blanchard 2014). Colonial-era accounts are often vague or silent regarding if or where from human remains were removed from Dayak communities (Bock 1881; Brooke 1866; Hose and McDougall 1993). Research exists that has begun to detail the osteological signatures of “head-hunting” as once practiced, and how decoration and modification varied between groups and possibly between the late 1800s and early 1900s, arguably when the private collection of these remains began (e.g., Okumura and Siew 2013; Mally 2015).

The diversity of trophy skull ornamentation in Borneo during the late 1800s-early 1900s is well documented. There are approximately eighty carved or decorated Dayak modified crania known within museum collections globally, according to a rough survey of various auction catalogues and published private collections by AG (see Coppens 1999). Crania exhibiting designs engraved directly into bone are the most numerous, given the price increase elaborate carving affords. In the Colonial era, the tools used for carving were mostly small, straight, knives (*pisau raut*) and chisels (*pahat*). Decoration generally took the shape of stylized floral motives and scrolls (tendrils and shoots, see Guerreiro 2012, figures 2, 93). This specific combination of motifs has been recorded from the basin of the Melawi River in West Kalimantan (among the peoples of the Kayan River area, probably the Limbai Kebahan and Limbai Kayan – distinct from the Kayan population of central Borneo).

Similar patterns are found among the Tebidah and other groups in the Melawi basin, up to the Sarawak border, and extending to the southern regions of central Kalimantan, along the Kahayan, Katingan and Kapuas Rivers, corresponding to the West Kalimantan and Barito culture areas (Ut Danum, Siang, Ngaju, Taboyan Ma’anyan peoples). Luangan people, living between the Barito and the Mahakam rivers, might have also created decorations like this. Skulls exhibiting floral/foliate motifs are more likely to originate from the Landak, Tayan, and Bengkayang culture areas of West Kalimantan, near the Sarawak border. This geographical region does not form a “culture area”: it is settled by the Bidayuh and related groups. On the other hand, more complex and intricate designs covering the vault and parietal bones in separate fields, often combined with the use of pigments for colouring the cranium, derive from the Melawi river basin and, possibly, the southern border of West Kalimantan Province (Guerreiro 2012; Sellato 1986).

In Western Borneo specifically, decorative designs engraved on skulls frequently present variations of the same patterns. Among different peoples, loosely related to the Bidayuh and Kanayatn (Kendayan), a floral motive is incised on the upper section of the cranium. These patterns show a symmetry based on the general skull shape in the central section of the cranium, as on the frontal and occipital bones (Ling Roth 1896: II, figures on pages 148, 151, 152). Usually, the ornamentation is composed of flowers with petals that divide the vault into four quarters, which are in turn divided by other petals or young shoots that flow into curvilinear designs. This evokes the growth of plants, a metaphor of ‘life’ and/or ‘fertility’.

Engraved decoration on trophy skulls can also reflect Bidayuh and Iban beliefs linked to the notion of a ‘life principle’, or ‘spirit’ of an individual (*semangat*) in their animistic ontology (Arnhem and Sprenger 2016). In short, it associates the fertility of rice (*padi*) and that of human beings to the presence of a *semangat* common to humans and plants. It may be related to the similar Iban concept of *ayu*, literally ‘life’, or ‘vitality’. The *ayu* is metaphorically represented by a bundle of plants associated with each human’s *semangat*, growing on the slopes of a mountain, that disappears at the time of an individual’s death. Although the Iban did not decorate trophy skulls (*antu pala*), they placed them in rattan frames (*ringka*),

suspended from the rafters on the longhouse gallery, the *ruai* (Freeman 1979; Freeman 2009; Richards 1981; Sather 1993).

The position of the perforated hole or holes usually located just before, at or behind the point of bregma (where the frontal and sagittal sutures join), or along the sagittal suture, is also crucial to consider. Such holes form the ‘entry’ and ‘exit’ point of the soul or vital force into or from the body, activated during shamanistic healing and purification rites (Dournes 1969; Geddes 1973). More generally, these ideas can be connected to the floral/foliate ornamentation commonly seen on burial posts, mostly scrolls - formed of leaves and shoots - from Western Borneo, i.e., the larger Kapuas region extending from the Melawi to the Barito rivers (south-central Borneo) and between the Pasir and the Mahakam basins (West Kutai). Interestingly, a coffin model from the Kapuas region shows similar designs to that of a skull from the Paget collection held by the Weltmuseum, Vienna, (Leigh-Teisen and Mittersakschmöllner, 1999: figures 162, 189, 190). This distribution approximately corresponds to the spatial distribution of the practice of engraving skulls with floral designs, specifically a lotus flower or lily, hence the large and symmetric petals. The design motif includes tendrils and foliate patterns arranged symmetrically on distinct ‘fields’ of the cranial vault and the parietals and temporal bones, following the sutures of the skull.

Half-skulls show similar types of ornamentation, with variations. Possibly, they were engraved before being cut (usually) neatly into two halves by using metal saws, usually following the sagittal suture as close as possible. There are a few published examples, e.g., a skull from West Borneo displaying a typical floral design combined with red dye (possibly made from “dragon’s blood”, *Daemonorops draco*), the eye being indicated by a cowrie shell set into fresh gutta percha within the orbit (Sellato 1989: 207, see illustration number 324). The four half-skulls studied by Winzeler from Kampung Groggo (Bidayuh), not far from the Kalimantan border, exhibit similar decorative motifs, although the large floral patterns on these half-skulls did not match each other. Interestingly these engraved skulls are said to have come from Sambas (Winzeler 1999: figures 1-4). On the other hand, rare examples have only a single floral motif incised on the frontal bone (Stöhr 1981: 112, see illustration number 67). According to Hugh Low writing in the middle 19th century, some Bidayuh in Sarawak had developed a specific ornamentation unique to their trophy skulls:

“The heads of the enemies of these tribes are not preserved with the flesh and hair adhering to them as are those of the Sakarran Dyaks [Iban people from the Skrang River]; the skull only is retained, the lower jaw being taken away, and a piece of wood substituted for it. These ghastly objects are hung up in the Pangah, which Capt. Keppel facetiously calls the ‘skullery’, and are often painted with lines of white and red all over them, they are occasionally blackened with antimony, and have cowrie shells placed in the apertures of the eyes, with the flat, or white side outwards, which, in some measure, resembles the closed eye, the little furrows appearing like eyelashes.” (Low 1848: 303).

It can be noted that the Bidayuh-speaking groups in Sarawak and closely related peoples in West Kalimantan, who formerly had the tradition of decorating their trophy skulls (either by engraving or painting), also had a men’s house (*barai, pangah, baruk*). In the building most of the trophy skulls or half-skulls were kept as community heirlooms together with bronze cannons (Nuek 2005; Winzeler 1998, 2004: 103-116). During colonial times in Sarawak this building was dubbed the ‘Headhouse’ (Geddes 1973). Particular individuals, such as important men or warriors, would also conserve such trophies in their longhouse apartments (*romin*), kept up in the attic.

METHODOLOGY

The assemblage was formally accessioned into the “Ethnography collection” of the museum (not the archaeology collection) in 2015, with numbers assigned sequentially according to individual order of accession. Regarding the osteological assessment of the assemblage, age estimates were obtained primarily

from the degree of cranial suture closure and tooth eruption (for younger individuals). White and Folkens (2005) and Buikstra and Ubelaker (1994) provide concise summaries of standard scoring procedures to obtain at least broad age class estimates by this means. Frequently, adult age classes are defined as YA (young adult; 18-30); MA (mature adult; 30-50) and OA (older adult; 50+). Given the sample size of this assemblage, the fact that relatively few individuals have teeth, and the uncertain provenience and thus potentially mixed (Dayak and non-Dayak) population affinities of the crania seized, more precise age assessment via population specific occlusal (chewing surface) molar tooth wear (e.g., Scott 1979; Gilmore and Grote 2012) was not possible, despite this being the most precise method to obtain age estimates for isolated crania.

Sex estimates were obtained via macroscopic analysis of those aspects of the cranium that show greatest degree of population-specific sexual dimorphism: the supraorbital margin, glabella, mastoid process, and nuchal crest (see White and Folkens 2005 for figures that depict where on the skull these points are located). Cranial, mandibular and molar size and robusticity (relative size, weight or thickness of a bone) can also be informative for estimating the sex of an individual, especially from the skull alone. Each sexually dimorphic region is scored 1-5 based on degree of robusticity (White and Folkens 2005), where scores entirely or mostly 1 or 2 suggests female and entirely or mostly 4 or 5 suggests male. Although no other skeletal elements were present to refine age and sex estimates, a probable sex estimate and broad age estimates can still be made from adult crania. Juvenile age estimates were obtained via assessment of the degree of dental eruption and degree of closure of two cranial sutures that completely fuse before one's early 20s under normal conditions (Krogman and Iscan 1986).

Evidence for taphonomic modifications, trauma, pathology, and the categories of decoration applied were each assessed macroscopically and predominately recorded as present or absent, accompanied by descriptive notes recording the location and type of trauma, location and severity of pathology, and the nature of taphonomic modifications. The terminology used in this paper to describe osteological characteristics, taphonomic modifications and evidence for trauma or pathology are common to osteoarchaeological and forensic practice. Defining each term is beyond the scope of this paper but see White and Folkens (2005) and chapters in Grauer (2012), Kimmerle and Baraybar (2008), and Schotsmans et al. (2017) for concise definitions. Photographs of each individual were taken from front, right, left, back, and underside (basiscranial) perspectives, in addition to close-up photographs of maxillary and mandibular dentition and specific details as warranted. All photographs taken by DH were on a black background positioned on a flat table surface, using a label, large-object scale bar, and 5cm scale bar, or external lighting where needed. Those taken by AG or Sarawak Museum staff were on white backgrounds.

RESULTS

This section presents a summary of the results of the osteological analysis of this assemblage, focusing on demographics, decoration or other modification for sale, pathology, trauma, and taphonomic modification accrued post-mortem that can be indicative of burial or storage environment before the subsequent collecting or attempted trafficking of the remains in question.

Table 1 presents the results of the age and sex estimates for the 16 individual crania examined. Ten of the 16 (62.5%) were determined to be adult males with a moderate to high degree of certainty, while three (18.75%) are adult females with a moderate to high degree of certainty. A further three individuals (18.75%) are juveniles aged between eleven and eighteen years old at death via the means of sub-adult age assessment discussed above. Only five individuals (31.25%) have any teeth present, and only three individuals (18.75%) have mandibles present.

Specimen ID#	Age Class	Age Estimate	Male	Possible Male	Possible Female	Possible Female	Juvenile	Mandible Present	Teeth Present
2015/Ni 125	YA	25+ yrs				X			
2015/Ni 126	MA	30 to 40 yrs	X						
2015/Ni 127	MA	30 to 40 yrs	X					X	X
2015/Ni 128	C	11 to 13 yrs					X		X
2015/Ni 129	YA	20 to 30 yrs	X						X
2015/Ni 130	YA	20 to 25 yrs	X						
2015/Ni 131	MA	40 to 50+ yrs			X				
2015/Ni 132	YA	20 to 30 yrs	X					X	X
2015/Ni 133	OC	15 to 20 yrs					X		
2015/Ni 134	YA	20 to 30 yrs				X			
2015/Ni 135	YA	20 to 25 yrs	X						
2015/Ni 136	YA	20 to 25 yrs	X						
2015/Ni 137	OC	15-18 yrs		X					
2015/Ni 138	MA	40+ yrs	X					X	
2015/Ni 139	OC	15-18+ yrs					X		
2015/Ni 140	YA-MA	20-40 yrs	X						X

C = child; OC = older child; YA = young adult; MA = mature adult.

Table 1: Age and sex estimates.

Table 2 presents the results of our analysis of the frequency and type of decoration or other post-mortem artificial modifications seen in the assemblage. In this analysis, we follow the criteria of Douglas and Stodder (2006), in which they define additive modification as the affixing of decorative elements (e.g., modified portions of bone, shell, fibre, etc., or pigment, clay, hair, or other organic materials) to the remains, and reductive modification as the creation of decoration through the removal of bone or teeth. All sixteen individuals exhibit some form of both additive and reductive modification or decoration.

Age Class/Sex	Carved	Painted	Blackened	Perforated	Patina/staining	Bound jaws
C	1/1 (100%)	N/A	1/1 (100%)	N/A	1/1 (100%)	N/A
OC	3/3 (100%)	N/A	3/3 (100%)	3/3 (100%)	3/3 (100%)	N/A
YA	7/7 (100%)	N/A	6/7 (85.7%)	5/7 (71.4%)	7/7 (100%)	1/7 (14.3%)
MA	4/4 (100%)	1/4 (25%)	4/4 (100%)	3/4 (75%)	3/4 (75%)	2/4 (50%)
YA-MA	1/1 (100%)	1/1 (100%)	1/1 (100%)	N/A	N/A	N/A
M	10/10 (100%)	1/10 (10%)	9/10 (90%)	8/10 (80%)	9/10 (90%)	3/10 (30%)
F	3/3 (100%)	1/3 (33%)	3/3 (100%)	1/3 (33%)	2/3 (66%)	N/A
Indt	3/3 (100%)	N/A	3/3 (100%)	2/3 (66%)	3/3 (100%)	N/A

Table 2: Frequency of decorative motif/artificial modification by age class and sex.

Table 3 summarizes the patterns of natural modification, so-called taphonomy, observable on each individual in the assemblage. Taphonomy, especially forensic taphonomy, can be generally defined as the study of what happens to the body after death (Dirkmaat and Cabo 2016). Certain aspects of taphonomy

that might be common to archaeological assemblages, or those exposed to open air or deposited in ossuaries or catacombs, are not present in this assemblage. These include insect damage, adhering roots or rootlets, bleaching and water damage. The presence of soil or mud adhering to bone or filling in orbits, dental crypts, or other natural voids is more or less consistent across the assemblage. Other taphonomic modifications observed on almost all crania include post-mortem breaking, polishing (mostly due to storage conditions or handling post-collection, during transit, and after museum curation), and staining or mottling in colours ranging from buff to brown to black. Except for 2015/Nil 129 and 2015/Nil 137 that exhibit black staining consistently uniform over the entire cranium (129) or demarcated by a clear line at parietal (137), the mottled nature of the staining observed suggests soil discoloration and random exposure to the elements. Rarer taphonomic indicators, such as animal damage (here, rodent gnawing), spalling (flaking) of the outer surface, weathering, or adhering dried tissue (see Pokines and Symes 2013 chapters 4, 9, and 11; Haglund and Sorg 1996) occur here in no more than 4/16, or 25%, of individuals). None of the natural or artificial taphonomic modifications recorded were seen to be unique to a specific age class or sex.

Individual ID#	Postmortem breaking	Animal damage	Adhering Soil	Tissue	Staining	Spalling	Weathering	Polishing
2015/Nil 125	X		X		X		X	X
2015/Nil 126	X		X		X			X
2015/Nil 127			X	X	X			X
2015/Nil 128	X	X	X		X		X	
2015/Nil 129	X	X			X			X
2015/Nil 130	X	X	X		X	X		X
2015/Nil 131	X		X		X	X		
2015/Nil 132			X		X			X
2015/Nil 133			X		X			X
2015/Nil 134	X		X		X			
2015/Nil 135			X		X			X
2015/Nil 136	X		X		X			X
2015/Nil 137	X		X		X			X
2015/Nil 138	X		X		X	X		
2015/Nil 139	X		X		X	X		X
2015/Nil 140	X		X		X			

Table 3: Category and location of observed taphonomic modifications.

Table 4 summarizes the patterns of trauma observable on each cranium in the assemblage. It includes whether or not identifiable trauma is present at all, the timing of the trauma (antemortem, perimortem, or postmortem), the number of observable instances of trauma, their location on the cranium and/or mandible, and whether or not the trauma observable is clearly indicative of decapitation or artificial post-mortem enlargement of the foramen magnum in the process of preparing the skull for postmortem modification and decoration. Trauma indicative of decapitation or a specific pattern of foramen magnum enlargement that is uniform around the perimeter of the foramen is often associated with the head having been taken in a head-hunting raid in cultures where it was practiced, such as the Dayak (Okumura and Siew 2013). Clear evidence for perimortem decapitation by sharp-force trauma (especially where only the cranium and/or mandible is present) is usually defined as the cutting, or partial or complete removal of, the occipital condyles, sometimes in addition to cutting of the mandibular ramii and/or complete or partial removal of the

mandibular condyles. By those criteria, no individuals meet the definition of clear decapitation. Those labeled “unclear” under decapitation show some degree of damage to either the occipitals or foramen magnum, but of a category more likely to be postmortem. Individual 2015/Nil #130 exhibits fatal sharp-force trauma that removed a large section of the right parietal and occipital, together with the unfused temporal bone, but no trauma to the occipital condyles or foramen magnum. Individual 2015/Nil 132 exhibits a unique example of a decorative motif carved into the black stained exposed surface of a notched section removed from the ectocranial table of the distal left parietal due to sharp-force trauma, in addition to a notched cut to the posterior border of the left mandibular ramii and a large shallow cut to the occipital, not visible in the photograph (see Figure 6).

Individual ID#	Trauma present	Timing	Number of events	Location	Decapitation	Foramen magnum enlarged
2015/Nil 125	No				Unclear	Yes
2015/Nil 126	No				No	No
2015/Nil 127	Yes	Peri	Multiple	Mandible, occipital, possible occipital condyle	No	No
2015/Nil 128	No				No	No
2015/Nil 129	No				No	No
2015/Nil 130	Yes	Peri	Multiple	R. temporal and occipital, orbital margin, R. zygomatic, occipital condyles.	No	Unclear
2015/Nil 131	Yes	Peri/post	One	Occipital condyles	Unclear	No
2015/Nil 132	Yes	Peri	Multiple	Mandible, gonial region, occipital, L. parietal	No	Yes
2015/Nil 133	No				N/A	Yes
2015/Nil 134	Yes	Peri	One	R. mastoid	Unclear	Yes
2015/Nil 135	No				No	No
2015/Nil 136	No				N/A	N/A
2015/Nil 137	No				No	No
2015/Nil 138	Yes	Peri/ante	Two	R. temporal, L. parietal	No	Yes
2015/Nil 139	Yes	Peri	Multiple	Frontal, L. parietal, L. mastoid	Unclear	No
2015/Nil 140	No				No	No

Table 4: Category, location and nature of observed trauma.

Finally, patterns of osseous and/or dental pathology per individual can be seen in Table 5. Here, the * signifies uncertainty regarding whether the pathology recorded is truly present or absent due to bone preservation or degree of expression, but for which present was deemed most likely. In terms of categories of pathology assessed, these included the presence or absence (and noted degree of severity) of: *Cribra orbitalia*, premature synostosis, button osteomas, periosteal reactions, lytic lesions, and proliferative reactions. Dental/alveolar pathology scored included degree of overall occlusal attrition, presence, number, location and severity of caries, abscesses, presence and number of linear enamel hypoplasias, presence and severity of dental calculus, and presence, number and location of antemortem chipping. Overall frequency of pathology is quite low, with only 18-25% of individuals displaying any observable pathology. All but four crania lacked teeth entirely (common in ‘trophy skulls’), and the number of teeth remaining, and their degree of attrition, varied. Those two crania with caries exhibit a small occlusal pit in the lower left 2nd molar (2015/Nil 132), or a larger pit destroying the mesio-lingual corner of the upper left 2nd molar (2015/Nil

127). Abscesses, LEH, calculus and chipping are almost non-existent, and very minimal or faintly expressed for those exhibiting them. Of the three crania showing *Cribra orbitalia*, only one (2015/Nil 126) exhibits a severity beyond faint and possibly healed or healing; specifically, moderately severe active lesions unilaterally in the left orbit. Periosteal reactions, lytic lesions and proliferative reactions were also assessed for, but none were encountered.

Individual ID#	Osseous Pathology	Dental Pathology	<i>Cribra orbitalia</i>	Premature synostosis	Osteomas	Attrition	Caries	Abscesses	LEH	Calculus	Chipping
2015/Nil 125	Yes	No teeth	1	0	0	No teeth	0	0	0	0	0
2015/Nil 126	No	No teeth	0	0	0	No teeth	0	*	0	0	0
2015/Nil 127	No	Yes	0	0	0	Severe	1	1	0	0	0
2015/Nil 128	No	No	0	0	0	Minimal	0	0	0	0	0
2015/Nil 129	No	No teeth	0	0	*	No teeth	0	0	0	0	0
2015/Nil 130	Yes	No teeth	1	0	0	No teeth	0	0	0	0	0
2015/Nil 131	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 132	No	Yes	0	0	0	Moderate	1	0	1	0	1
2015/Nil 133	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 134	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 135	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 136	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 137	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 138	No	No teeth	0	0	0	No teeth	0	0	0	0	0
2015/Nil 139	No	No teeth	0	*	0	No teeth	0	0	0	0	0
2015/Nil 140	Yes	No	1	0	0	Moderate	0	0	0	1	0

Table 5: Category and location of observed pathology.

All the crania exhibit carving of some type, whether shallow grooved incisions with rounded bases and dull edges or exhibiting deeper V-shaped incisions with sharper edges. The degree of sophistication seen in the decoration, in terms of cleanliness and uniformity of carving, clarity of motifs, and the condition of the non-carved bone in between bands of motif varies considerably. Carving motifs are varied, ranging from curvilinear floral designs to more linear, cross-hatched or broken-line designs, and decoration covers the frontal, parietal, superior temporal, and superior occipital bones in all instances. The presence of soot blackening and/or the application of some form of dark stain to create a dark brown or black patina on at least the basicranial and occipital regions of the skull is also more or less consistent across the entire assemblage. Three individuals (2015/ Nil 127, 2015/Nil 132 and 2015/Nil 138) have their mandibles affixed to their maxillae (upper jaws) via either a thick rusted wire wrapped through the nasal cavity and around the mental eminence as well as shorter wires extended through bilateral holes drilled through the superior ramii and wrapped around the zygomatic arches, or otherwise thin wire around the mandibular condyles and through the zygomatic arches or perforating the superior ramii (see Figures 3a and 3b below).

The five crania (2015/Nil 133-137) that are half-skulls, three left-side and two right-side (see Figures 4a and 4b), each exhibit different types and degrees of decoration, but carving does not extend onto the temporal bone. In one instance (2015/Nil 137), the cranium was not cleanly sectioned along the sagittal suture. One half-skull (2015/Nil 133) has the remaining orbit in-filled with resin or mud, while another (2015/Nil 134) has a row of seven small spikes (material unknown) situated between two carved curving lines just above the supra-orbital margin, as well as traces of an inorganic glue within the orbit itself

suggesting it was once filled as well. Each half-skull has a single drill hole perforation either at or posterior to the point of bregma, but the coloration and overall decorative motif varies.

2015/Nil 139 (see Figures 5a and 5b) is a complete cranium with both orbits infilled with dark resin or pitch and two cowrie shells, one in each orbit, as well as a thick steel loop ran through two drilled holes just posterior to bregma. Individual 2015/Nil 138 is missing the entire splanchnocranium and basicranium, although the mandible (with all teeth lost postmortem) is present, attached to the neurocranium via metal wires. Comparative examples of known Dayak crania with identical or similar decorative motifs such as these, now held by museums or in-situ within Dayak communities can be seen in Guerreiro (2012) and Winzeler (1999).

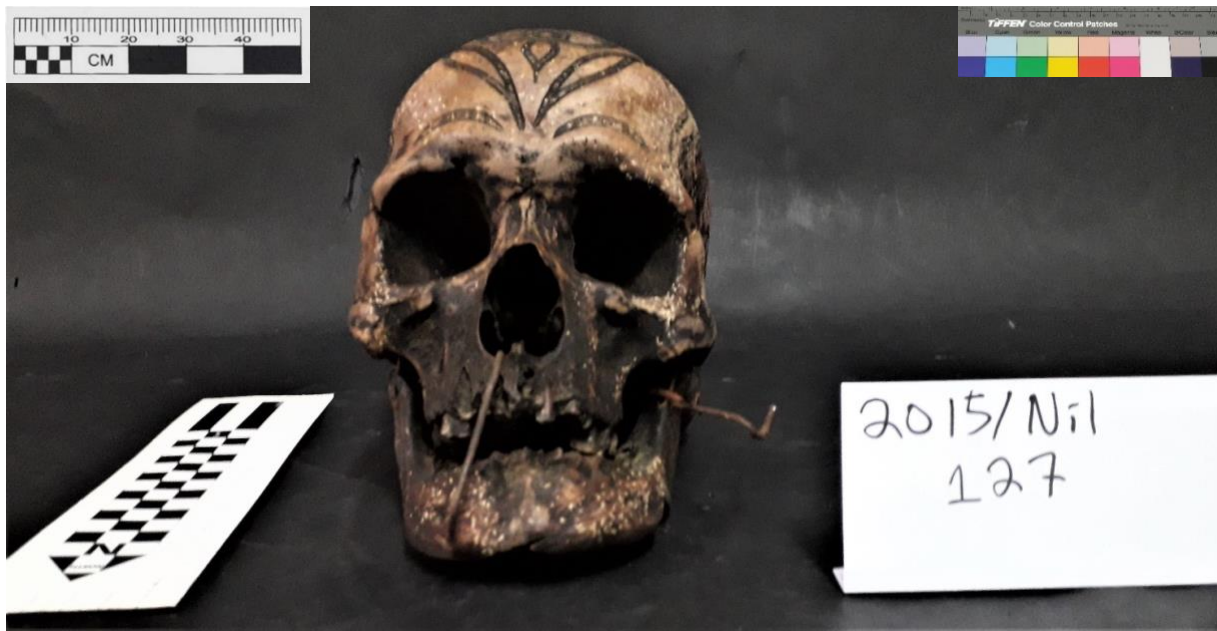


Figure 3a: Skull 2015/Nil 127 frontal view showing mandible loosely secured to maxilla with wire, soot and/or soil staining from the nasal aperture below, severe dental attrition and deep cuts along the mandibular border.



Figure 3b: Skull 2015/Nil 127 sagittal view showing depth and nature of the floral design applied, the polishing of the uncarved bone, and the wire securing the mandible wrapped around the left zygomatic arch (the wire was loosened to examine the teeth and mandible more closely).



Figure 4a. Half-cranium 2015/Nil 133, an example of a left-side semi-cranium showing infilled orbit, intricate infilled shallow incised designs, and adhering soil.



Figure 4b. Half-cranium 2015/Nil 134, an example of a right-side semi-cranium showing formerly infilled orbit, intricate more deeply incised designs, and adhering soil and glue or resin.



Figure 5a: Cranium 2015/Nil 139 frontal view showing modification of the orbits, peri- or postmortem fracture across the frontal and left parietal, shallow incised decoration, staining and iron suspension ring.



Figure 5b: Cranium 2015/Nil 139 sagittal view showing the suspension ring embedded behind the point of bregma.



Figure 6: Skull 2015/Nil 132 showing a decorative motif carved into the surface of a notched section removed from the ectocranial table of the distal left parietal, in addition to a notched cut to the posterior border or the left mandibular ramii.

DISCUSSION

Case studies such as this can provide rare insight into what trafficked remains actually “look like”, osteologically speaking. Thus, it is important to systemically analyse every possible aspect of the osteology and means of modification of such an assemblage, at least those approachable through non-destructive means, when afforded the opportunity. Doing so places a seized assemblage into the larger socio-cultural context of how the contemporary online trade of human remains (summarized above) works. Furthermore, the information provided by the contextualized osteological analysis of human remains alleged to belong to Indigenous communities is important to curators, descendant communities and law enforcement. Each of these stakeholders, for different reasons, are concerned with or responsible for separating cases representative of cultural heritage theft from those of “medico-legal import”, thus potentially connected to an active criminal investigation.

There are any number of ‘store fronts’ online for buying and selling human remains. Some of these are websites with digital shopping carts; some of these are Facebook pages with Facebook’s ‘marketplace’ feature enabled. Many are simply user pages on sites like Instagram, a photo of a skull or long bone or spinal column with the caption ‘DM [direct message] me for price, shipping options’, a sales policy that extends to person-to-person interaction within numerous private and secret groups on Facebook as well. Until

recently one could also find human remains easily on online auction sites like eBay (Vergano 2016; eBay n.d.). In the figures below, example screenshots of human remains for sale have been anonymized to respect the privacy of the individual involved. Although vendors placed these posts with the expectation of making a sale, and thus do not have a reasonable right to privacy, we have anonymized these posts out of respect that the vendors do not expect to be monitored.

Previous research indicates a wide range of dollar values for different kinds of human remains. Remains that are obviously ‘exotic’ (from a white, Western point of view) command the highest prices. Surveillance of these communities of traders and collectors conducted by DH and SG has begun to indicate that osteological and cultural knowledge amongst traders and collectors of what and “who” is actually being collected is relatively low (Graham et al. 2020). Our research has also begun to define the concept of “culturally fake, osteologically real”, in regard to the trafficking of potentially unprovenanced remains modified to resemble examples once created by Indigenous communities. We have observed in photographs numerous examples of what appears to be a real human skull but drilled and adorned with what are patently fake cultural modifications, in terms of what is known of pre- and post-contact human remains modification practices of the culture the skull is claimed to derive from. Sometimes the sellers admit as such.

On the other hand, we do see many examples circulating online of what are likely to be cranial showing cultural and taphonomic modifications accurately matching provenanced museum examples collected *in situ* primarily during the c. late 1800s-early 1900s from those numerous cultures worldwide that practiced post-mortem crania modification, including numerous Dayak groups (see Figures 7 and 8 below). The ability to obtain sex and age estimates, assess morphological or genetic population affinity or investigate the veracity of alleged production by a specific culture are all lost without the ability to perform careful hands-on research. In a separate study, we found reason to believe that in a sample of 28 photographs of general crania for sale, only seven seemed to correspond, in terms of stated sex estimate and population affinity, with what the vendors purported them to be (Graham et al. 2020). That study depended on comparing the unprovenanced crania with groupings of human skulls suggested by a neural network trained on photographs of crania that appear in the forensic literature or in secure museological settings.

The close study afforded by this seizure of trafficked human remains as described in this paper, remains that the seller and buyer both believed, or wanted to believe, were ‘culturally true’ (even if several show modifications made for sale), will enable us to better train machine vision systems to recognize natural and cultural taphonomic markers, or patterns of pathology common to looted or stolen remains likely to derive from specific times, places or cultural traditions. This will in turn enable us to begin to understand something of the scale and scope of human remains originating from this part of the world in the online marketplaces.

Help en info Veilig handelen Inloggen Berichten Meldingen Plaats advertentie


Marktplaats Alle groepen... Postcode Alle afstanden... Zoek

Terug naar resultaten Home > Verzamelen > Overige Verzamelen > Advertentie m1263925402

Schedel mens, menselijke schedel

89 x gezien 11 x bewaard (sinds 11 mrt. '18, 19:22)

Bewaar



€ 350,00

Levering
Ophalen of Verzenden

Bericht

Bieden

Plaats een bod

DC € 325,00 11 mrt. '18

Anderen bekeken

Zelda Breath of the Wild Luminart Canvas Light
€ 25,99
Heel Nederland

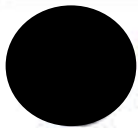
Wetenschap & Spel - Ontdek Het Menselijk lichaam Clementoni
€ 9,95
Heel Nederland

Kenmerken
Conditie : Gebruikt

Beschrijving
Mooie gegraveerde mensenschedel!
Leuk dat hij opgehangen kan worden!

Deel via: <https://link.marktplaats.nl/m1263925402> Bewaar

Figure 7: An alleged Dayak skull with design and decorative motifs similar to authentic Colonial-era examples described above. Image is screen-captured from Marktplaats.nl, posted on 11-03-2018. Text below the image reads (paraphrased): “Description. Beautiful engraved human skull. Nice that it can be hung.”



1 July 2016

Thanks for the add.

This is my favourite piece: a late 1800's Iban trophy skull, ex Coppens collection. Still some skin and hair on it underneath his "hat".



Like



Comment



19

Figure 8: An alleged old Iban Dayak crania with reed cap (ketapu) and remnant skin and hair. Image is screen-captured from a Facebook group, posted on 01-07-2016.


The primary conclusion to be reached from the osteological analysis of this assemblage above and its socio-cultural context are that these crania mostly represent “culturally fake, osteologically real” specimens. That is, they are made from real human bone but, with perhaps one exception, do not correspond with known Colonial-era examples of the decorative motifs and methods of modification known to have been performed by each Dayak group. In this case, these crania were possibly smuggled into Sarawak from West Kalimantan, then carved somewhere in Sarawak according to designs found in classic ethnographic publications, before being smuggled out of the State. It is likely that sophisticated equipment such as dentist’s tools or mechanical chisels were used in the carving of some of these skulls, especially the most elaborate ones. The nature and depth of the indentations on the external surface of the bone reflects how the skulls were engraved.

Some of the skulls’ decorative motifs reflect the traditional flowery/vegetal patterns common to the Bidayuh related groups of West Kalimantan living along the border with Sarawak as indicated above, within the area associated with number four in Figure 1. While other skulls and half-skulls sport ‘invented designs’ loosely

inspired by Dayak decorative patterns, we noted above that the latter consistently appear to be rather crudely made. By ‘invented designs’, we mean decorative motifs not known to match any documented example retained by Dayak communities, nor in a provenienced museum collection, nor any published catalogues of early private collections (e.g., Alpert et al. 2000). Other crania in the assemblage are also broken or otherwise in poor condition. There is a possibility that at least some of these crania originate from the victims of riots against Madurese people that took place in West Kalimantan during the late 1990s, especially in the Sambas and Sanggau areas in 1996, 1999, and the early 2000s. A thousand or more victims, including men, women, and adolescents, were killed and hundreds decapitated during the riots (Aglionby 1999; Davidson 2008; Davidson and Kammen 2002; Giring 2004; Guerreiro 2008). The fact that almost all the skulls in the seized assemblage are most likely to be male (11), in addition to two females and three juveniles as indicated in Table 2 above, would also support that hypothesis. Only via conducting more in depth morphological and DNA analysis of seized remains such as this assemblage could resolve this question.

Traditionally, the West Kalimantan regions bordering Sarawak (Lundu/Bau/Kuching/Tebedu/Serian areas) are prone to smuggling and illicit trafficking across the porous border (Hsia and Saat 2020). However, some of the crania in this assemblage (Nil 2015 #128, #130, #135, #138, #140) do appear more ‘used’ or taphonomically altered. This may have been due to their being first buried and then stolen from graveyards, either Muslim or Christian, and then cleaned to some extent and transformed into “authentic” Dayak modified crania. The general features of these skulls prove that they have been either carved recently or recarved. Authentic Dayak trophy skulls tend to show rather thin lines shallowly engraved into the soft bone, except for those from the Melawi area which have deeper incised lines. The patina and colour of the bone are also relevant criteria; some rare authentic skulls exhibit a uniform light ivory colour, but usually they exhibit irregular-colored patches. Older skulls which have been recarved display deeper lines with marked indentation due to the harder bone surface, indicative of the use of mechanical, possibly electric drilling tools.


This is particularly obvious on crania showing Kayan – Kenyah type motifs such as spirals, scrolls (*kelawit*) and *aso*’ figures (2015/Nil 125). Traditionally, these communities did not engrave the cranium itself. Instead, they decorated trophy skulls using wooden ears, charms, and palm leaves. In the process of creating forgeries, a red dye or pigment is applied in order to soften or hide recent cut marks; a task done more or less successfully by any given forger. These reddish-brown, or more rarely, blackish-grey pigments or dyes, applied to the bone surface and within the fresh cuts are meant to give the impression of an ‘older’ skull. Some are even polished until smooth as a third step. However, the application of dyes and polishing tends to appear uniform and noticeably plain, covering the entire cranium’s or half-cranium’s surface. Recently, ‘Dayak trophy skulls’ exhibiting holes of various shapes carved through the cranial table, obviously done with an electric chisel symmetrically on both sides of the frontal bone, with the remaining bone stained with a yellow dye have begun to appear on the market. This specific ornamentation was not encountered before the 2000s. Regarding this assemblage specifically, future research could attempt to source the wire used to bind the jaws of 2015/Nil 127, 132, and 139 via trace element concentration analysis and comparison to a sufficient database of raw reference samples taken from hardware shops and mechanics in Pontianak, Kuching, surrounds, and possibly further afield (*sensu* Dettman et al. 2014). That none of the reference samples will be distinct enough to suggest a unique source or supplier is, however, a possibility.



Carved Kenyah Human Skull
 \$1,535

This is a real, contemporary, decorated human skull from the Kenyah peoples of Borneo! They have a long tradition of adorning human skulls with intricate carvings.

This would make an incredible addition to any collection, and can be shipped worldwide! We are asking \$1875CAD (~1535USD), buy it now on [redacted] or in-store Friday-Sunday (12-6pm) at [redacted]



Message Seller

Like Comment

3

Figure 9: An allegedly 'contemporary' Dayak cranium exhibiting decorative motifs somewhat similar to Kayan-Kenyah examples resembling kelawit and aso' figures, but not in alignment with Colonial-era examples. Image is screen-captured from a Facebook group, posted on 13-09-2017.

Numerous modern forgeries of Dayak whole and half-crania surfaced in the “tribal art” markets of Belgium, France, and the Netherlands from c. 1997 to 2004 (Coppens 1999), and continue to surface and circulate online from many alleged sources today (see Figure 9 above). One of us (AG) documented several crania of this category sold to collectors via art galleries or at auction during the same period, while DH and SG continue to document and screen-capture numerous examples of authentic or alleged Dayak modified crania across social media and e-commerce platforms, among many other categories of human remains for sale, trade, or auction. In the case of forgeries of Dayak and other Indigenous modified crania, carving and coloring the cranium adds value to it, thus commanding a higher price. The production and release onto the market of numerous forged Dayak ‘trophy skulls’ that often look alike, smeared with a reddish-brown pigment (Jones 1990; Schefold 2002) suggests a smuggling network between West Kalimantan and Sarawak was active at the time, and that the seized crania analysed above were originally produced as a part of this recent effort to export ‘processed skulls’ out of Malaysia.

CONCLUSION

Frequently, the medico-legal question that remains when an assemblage of crania is seized from the market is “where do the skulls come from?” Deciphering the nature of this alleged assemblage of Dayak modified remains in the manner discussed above supports the notion that all purported ethnographic modified human remains seized should be evaluated against the ethnographic record itself, to the extent that it speaks to how, why, and for whom remains were modified in the culture in question during the Colonial era and how curio markets began with contact. In addition, the biological profile of each individual should be ascertained to the extent possible given the condition and nature of the remains (especially when the remains seized are whole or partial skeletons). The data obtained should be compared to more accurately provenanced and provenienced examples of the cultural tradition to which the seized material is said to belong to, often held in larger Western museums. Ideally, spectrographic analysis of pigments, stains, and artificial material such as resin or glue would accompany DNA and stable/radiogenic isotopic analysis of bone or dentin collagen and enamel to obtain the most complete biological profile for the unprovenienced remains possible (Watkins et al. 2017). When a full analysis is not possible due to funding or the need for relevant information to be provided quickly to secure forfeiture, then non-destructive analysis such as the above can be a crucial first step. In conclusion, we attest that the systematic investigation of this unique assemblage within its historic, cultural, and digital/criminological context, illuminates previously poorly known aspects of the trade or forgery of Dayak modified remains.

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