An Osteobiography of 19th Century Chinese Salmon Cannery Workers of Kodiak Island, AK

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Introduction

The daily life of late 19th century to early 20th century Alaska salmon cannery workers entailed seasonal, strenuous labor combined with harsh living conditions. For the workmen of Chinese descent in particular, this life was framed by the context of anti-immigration legislation, Sinophobia, and the kinship affiliations forged within the Chinatown districts of the western United States (Lyman, 1974).

This research analyzes skeletal remains of cannery workers from the Chinese cemetery at Karluk, Kodiak Island, AK. This cemetery was excavated in 1931 under Aleš Hrdlička's direction. The remains of at least 64 individuals were transported to the Smithsonian NMNH. The majority of these laborers originated from the Guangzhou region of China (Schmidt et al., 2011). The focus of this research was to conduct a preliminary assessment of these individuals in order to construct an osteobiography that reflects their physical stress, the relationships of skeletal taphonomy with cultural burial practices, and the identification of a few of the pathological conditions that may help explain their health and deaths.

Fig. 1 – Chinese salmon cannery workers; (Google Images)

Fig. 2 – Alaskan salmon cannery; (Google Images)

Chinese Immigration to the Western United States

Late 19th century China was characterized by political unrest, largely stimulated by growing opposition to the minority Manchus controlling the Qing dynasty. This, combined with the allure of the rising gold rush industry and railroad expansion in the United States, may have been a motivation for many Chinese natives to emigrate to the western United States (Schmidt et al., 2011). Coinciding with the gold rush economic success was the rising salmon cannery industry, which tripled in profits over the span of several decades (Freeburn,1976). This led to many workmen, especially Chinese immigrants, filling this employment niche.

Fig. 3 – 19th century political cartoon depicting the hypocrisy of Sinophobic legislation; (Google Images)

The passage of the Chinese Exclusion Act of 1882 prohibiting incoming Chinese labor led to an increased reliance on the pre-existing population by labor contractors, while simultaneously influencing the preservation of cultural tradition and strengthening the development of Chinese-formed groups known as "tongs" (Masson & Guimary, 1981). Often determined by common surname or region, tong affiliations formed a network of mutual aid and solidarity. Despite these bonds, rivalry among factions often resulted in conflicts known as tong wars (Lyman, 1974). These rivalries may explain some indications of interpersonal violence reflected from the cannery workmen skeletal remains.

Assessment of the Chinese Karluk Cannery Workers

Age Average	Average Femur Max Length	Average Stature Range (in inches)
33.31	430.5	63.51 – 66.51

Fig. 4 – Collective demographic averages of Chinese cannery workers

The sample consisted of 42 nearly complete individuals, combined with additional commingled skeletal remains of at least 16 individuals. Pathological conditions, taphonomic changes, and skeletal metrics were recorded. These remains were all assessed to be male, their age averaging 33 years old - ranging from early 20's to the mid 50's. The average stature was 5'3"-5'5" (Fig. 4).

Fig. 5 – Map of southeastern region of China; (Google Images)

This demographic profile is consistent with the presumed "aging up" of the working population following the Chinese Exclusion Act, as well as with the overwhelming male majority of Chinese-American immigrants (Lyman, 1974). While most of the workmen are believed to originate from the Guangzhou region (Fig. 5), preliminary analysis of the craniometric data suggests that some individuals may have originated from a different region. Macroscopic analysis demonstrated that approximately 31% of the individuals exhibited stress markers or robust muscle attachments on the bone. Due to the seasonal nature of cannery labor, it is not possible to conclusively attribute these activity-related markers wholly to cannery labor. Rather, it is more likely to be a product of consistently strenuous labor year round.

Case Study: Individual No. 363714

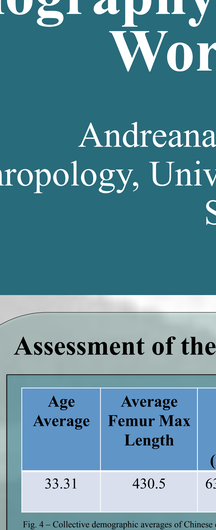


Fig. 6 – Individual No. 363714 in standard anatomical position; with essentially complete skeleton.

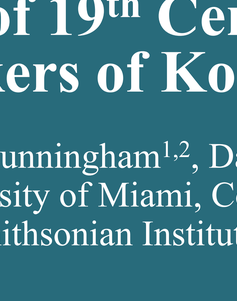


Fig. 7 - Individual No. 363714's skull with rod inserted to depict bullet trajectory

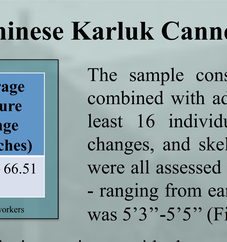


Fig. 8 - Computed Tomography scan of skull

This individual is phenotypically a male who died in his late thirties. The cause of death was quite likely a gunshot wound to the skull. The bullet trajectory is unclear, but wound characteristics suggest that the individual was shot from behind; the entrance wound is on the lower portion of the posterolateral right parietal and the exit wound is through the right eye orbit (Fig. 7). He exhibits additional signs of trauma, including a healed blunt force wound to the frontal bone and healed rib fractures. Although not definitive, this incidence of interpersonal violence may provide evidence of tong or kinship conflicts occurring among the workers. This individual also exhibited musculoskeletal stress markers, such as os trigonum of the tali. An ectopic tooth (Fig. 8) is embedded in the nasal region, serving as an individuating feature.

Figs. 9 & 10 – Forensic reconstruction of Individual No. 363714 in left three-quarter view and front view. Created with FreeForm Modeling Pro and Adobe Photoshop graciously provided by NCMEC and guidance from Joe Mullins.

Skeletal Pathologies and Anomalies

Fig. 11 - Skull with lytic lesion on frontal; individual most likely suffered from syphilitic illness

Fig. 12 & 13 – Individual with tuberculosis manifested on scapula and right humerus (left), and fusion of sternal body and first rib (right)

Surprisingly, few pathological conditions were found in the skeletal elements. The most common findings were neural arch defects, including 35% of the individuals exhibiting spina bifida (Fig. 14). Several individuals exhibit skeletal signs of disease, including tuberculosis (Fig. 12,13), and a lytic process, possibly syphilis (Fig. 11). Other conditions noted include fractured ribs, fractured metacarpals, and tibial periostitis. Most of the individuals exhibited no skeletal pathology that could indicate cause of death.

Fig. 14 – Sacrum exhibiting spina bifida

Staining as Evidence of Mortuary Practice

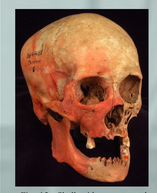
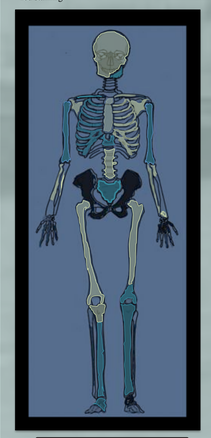


Fig. 15 –Skull with concentrated red staining

Fig. 16 –Skull with concentrated indigo staining

The vast majority of the individuals (an estimated 91%) have documented staining in at least one area of the skeleton. Varying in concentrations and colors, the stains were found most frequently on the occipital bone, the pelvic girdle, and the tarsals (Fig. 17).



of Staining Occurrences per Bone
0
1-5
6 - 9
10-12

The staining can be attributed to dyed cloth in which the individuals were buried. The localized concentration of green staining (Fig.18) is related to copper or brass clothing buttons or other types of fasteners in the burial fabric. The staining patterns correspond with literature detailing Chinese funerary practices, such as placing a cloth over the face or tying the feet with colored string (Watson & Rawski, 1988).

Five individuals exhibited extensive, vibrant skull staining, including concentrated hues such as red and indigo (Fig.15,16). The small number of workmen with this particular dispersion pattern suggests that the burials of these individuals were afforded differential treatment.

Fig. 18 - Left femur with localized green staining, with corresponding metal green button

Fig. 17 - This chart depicts the collective dispersion pattern of staining found on the workmen skeletons. The pelvic girdle and left metacarpals have the highest total occurrences.

Interpretations/Conclusions

Literature describing the Chinese custom of "secondary burial" (Chung & Wegars, 2005) in which eventual exhumation of the skeletal remains that are then sent back to China, is at odds with the individuals that were left behind at the Karluk cannery. It is unclear why these individuals' remains were never recovered. There are notes in Hrdlička's diary that there were burial bricks in several of the graves suggesting that an eventual return to China was expected.

The overall lack of pathological conditions manifested on the skeletal remains limits the ability to determine the cause of death for the majority of the individuals. The differential mortuary treatment of certain individuals' burials indicates a relationship between significant Chinese practices and taphonomic staining, but the explanation for the connection cannot be positively identified. Future research conducted beyond this preliminary investigation about the cannery workmen can address these questions further.

Acknowledgments/ References

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