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University of Toronto, Mississauga 2019
Foreword: Young, Inspired...and Inspiring

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I am absolutely delighted to be able to write the opening note to our first issue of Young Anthropology. This journal has been a while in the making and to see it come together brings a sense of pride to our department and faculty. We have long wanted to create a platform that would allow our students to showcase their work and demonstrate their passion for anthropology. Moreover, as faculty, we wanted to be able to highlight the achievements of our many excellent students, including our many wonderful alumni. Last, we looked for ways in which students could reflect upon the many opportunities anthropology offered them through experiential learning, study abroad, and internships. Young Anthropology, as a journal focused entirely on undergraduate work, offers all of that and much more. The journal is meant to gather original work from undergraduate students in anthropology, together with student and alumni profiles, interviews with anthropology students and faculty, and reflections upon different learning experiences. This first issue, we hope, is the first of many and displays students’ original ideas, their passion for anthropology, and the unique contributions they are already making to ongoing discussions in the field of anthropology. The journal incorporates all four fields of anthropology and thus will include articles focusing on sociocultural, linguistic, evolutionary, and archaeological anthropology. Many of our students conduct fieldwork, participate in labs, work in fieldschools or do extensive literature reviews as part of their coursework. Young Anthropology allows us to feature and celebrate some of the best work that students produced as part of these courses. And it is a true joy to see these final articles come to fruition and appear in a published format. A warm congratulations to all published authors!

This first issue features four wonderful articles addressing topics ranging from climate change and myths (Saghir), to conceptualizations of freedom and oppression among young women (Kotwal), analyses of pottery changes in historical Japan (Lun), and studies of drug overdoses in Nova Scotia (Shankar and Bowes). All based on original research, the articles demonstrate the interesting and important work done by our students. The interview with anthropology specialist and Forbes’ Under 30 nominee, Aleesha Singh, is inspiring to say the least and illustrates what anthropology can contribute to young people’s career goals. And Lydia Rehman’s reflection on her experiential learning trip to Japan (as part of Prof. Crawford’s course) speaks to how impactful international experiences and anthropological perspectives can be.

The contributors to this first issue of Young Anthropology are not only young and inspired; they are also incredibly inspiring. It is my sincere hope that other students read this work and understand what they too are capable of; that these articles, interviews, and reflections motivate and inspire students to explore their own interests in anthropology and possibly make a contribution to one of our future issues.

I truly hope you enjoy this exciting first issue of Young Anthropology just much as we enjoyed putting it together.

Happy reading,

Prof. Sarah Hillewaert
Associate Professor
Editor of Young Anthropology
Torrent and Tempest and Flood. An Analysis of the Flood Myth Across Cultures.

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Abstract
Disaster and Catastrophe myths are common in all cultures. Of these, the most widespread is the flood myth, which is found in one form or another in the folklore of every culture across the globe. This essay, treating the flood myth as a cross-cultural constant, analyses three prominent tales of the deluge from geographically disparate regions; the Mesopotamian tale of Utnapishtim, the Greek myth of Deucalion, and the Maori legend of Parawhenuamea. Four shared themes of these narrative accounts are identified and analysed to develop a typology of the flood myth. This typology is situated as part of a larger destruction-creation dialectic which characterizes both cultural mythology and natural ecology. This typology is applied in a critical examination of climate change discourse to position climate changes as a type of twenty-first century flood myth.

Keywords: myth, floods, climate change

1. Introduction

Floods are usually thought of as purely destructive phenomena. However, research shows that floods are not only destructive, but also productive. This precarious balance has made floods a vital part of human life and culture. In this article, I examine flood myths from around the world in order to understand how human beings conceptualize the deluge across cultures. Through an analysis of flood myths from Mesopotamia, Ancient Greece, and the South Pacific, I argue that flood myths are characterized by four shared themes and a “destruction-creation” cycle. Further, I apply this analysis to argue that climate change can be understood as a type of flood myth.

2. The Three Myths

One of the oldest known flood myths is the Mesopotamian story of Utnapishtim, found in Epic of Gilgamesh (c. 2100 BCE), widely believed to be the predecessor to Noah’s Ark. In this tale, Utnapishtim was the king of the ancient Iraqi city of Shuruppak on the Euphrates River, where the population multiplied and people grew so riotous that the gods declared that “The uproar of mankind is intolerable” (Withington 2013, 12), and decided to destroy mankind. The god Ea, however, wanted humanity to survive, and warned Utnapishtim in a dream to “abandon his possessions and build a boat” to be called the Preserver of Life, to carry “the seed” of all living creatures (ibid.). The day after the boat was completed, “torrent and tempest and flood overwhelmed the world”. After seven days of flooding, Utnapishtim’s boat settled on a mountaintop, the waters receded to reveal new land, and the righteous survivors repopulated the world (ibid.):

Utnapishtim’s deluge is remarkably similar to the ancient Greek myth of Deucalion (400 BCE). This myth begins with a Golden Age, in which all humans did right and prospered; after this time, however, society declined until humans reached the Age of Iron, when “all evil burst forth” (Withington,
News of this reached Jove, King of the gods, and when he came down to earth to see for himself, he was so appalled by the evil of mankind that he declared: “I must destroy the race of man” (ibid.). He brought down rain and instructed Neptune to release the rivers until “All [was] sea...without a shore” (ibid.). The only survivors were the righteous Deucalion and his noble wife, who had been warned about the flood by Prometheus, who instructed them to build a boat to survive the deluge (ibid.). When Jove saw the virtuous survivors, he stopped the flood and allowed the water to recede; with the help of the gods, the two carried on to repopulate the earth with pure men, women, and animals, some new to earth (ibid.).

The Maori of New Zealand have a similar flood tale; in this myth, as humans multiplied and diversified, they abandoned their worship of the creator god Tane (Peschel 1971; Withington 2013). Of the few righteous believers remaining were the prophets Parawhenuamea and his father, who tried to warn humanity of the error of its ways, but were rebuked (Peschel 1971). Finally, angered by the mockery and certain that Tane would punish it, the prophets built a boat onto which they were instructed to bring fern, sweet potato, dogs, and two other men and some women (ibid.). They then prayed for the promised deluge, and Tane brought down “devastating rains” which destroyed the entire earth and lasted eight months; at the end of the flood, only the righteous aboard the boat survived, and they disembarked onto the newly-formed island of Hawaiki, from where they repopulated the earth (Peschel 1971).

3. Cross-cultural Classifications of the Flood

Despite their cultural and geographical diversity, these myths are extraordinarily similar and indeed representative of the majority of flood myths around the world (Withington 2013). I thus use them to identify four shared features which constitute a cross-cultural repertoire of factors associated with the flood myth.

The first shared feature is that the flood is a conscious form of punishment by a deity or deities. In the story of Utnapishtim, the humans are destroyed by the gods for being too disorderly; in the myth of Deucalion, Jove eradicates the people for their evilness; and amongst the Maori, Tane decimates humanity for neglecting their faith. Thus, across cultures, humans bring the flood upon themselves through their wicked behavior, and punishment forms the core of the deluge (Withington 2013).

The second feature is that the flood is always prophesied or predicted; that is, one or more people are warned that it is coming, and also how to survive it (Withington 2013). Utnapishtim, Parawhenuamea, and Deucalion were all fully aware of the flood before it arrived. Further, both Utnapishtim and Parawhenuamea received clear and detailed instructions from Ea and Tane respectively, on how to build a large boat and exactly what to bring to preserve further life. Prometheus’s warning to Deucalion was limited to only building a “little skiff” (Withington 2013:17), and no additional people or items, but was regardless a key part of the deluge narrative. Thus, the flood is never a complete surprise; humanity is given the opportunity to survive. Further, the warner is always divine or semi-divine (Withington 2013), suggesting that humans cannot predict or survive the flood without some form of non-human assistance.

The third feature is that only a few people survive (ibid.). The largest number of survivors was present in Utnapishtim’s flood, with the number significantly lower in the other two myths. Importantly, only the “righteous” people survive. This connects to the “punishment” feature of flood myths; the small amount of people who live are the only “good” ones left. Thus, the small number of survivors is not only due to the massive scale of the flood, but also because mythology positions the flood as a mechanism to literally wash away evil (Kamash 2008; Peschel 1971; Withington 2013).

Lastly, each myth ends in the repopulation of the earth. Thus, the flood never ends in pure catastrophe and death, but rather serves as a springboard for the birth of a new era, once more full of “good” people (Withington 2013; Kamash 2008; Peschel 1971). This is part of a mythological construction of floods as both destructive and generative, which is discussed next.

4. Destruction or Creation?

Flood mythology positions floods as neither purely destructive nor productive, but rather part of a destruction-creation cycle. In each case, the flood
serves as a “cleansing” of the earth, as it is the very destruction of the “evil” people that enables the generation of a new group of people to repopulate the earth. In all three myths, only the only the “righteous” were saved and hence reproduced more righteous people, literally giving birth to a new human race. Through showing that “The flood dissolves the past and allows for regeneration and the establishment of a new era,” (Kamash 2008, 227) myths position the flood as inherently generative.

In addition, “the flood’s destruction often leads to a…purified creation [that] is actually a recreation” (Peschel 1971, 116). Thus, the destruction-creation dialectic of deluge myths can be understood as a type of (second) creation myth. This is seen in the flood’s generation of new land in the Mesopotamian and Maori myths, and the creation of new animals and human beings following Deucalion’s deluge. Thus, the flood serves as a return to the “primordial sea” of many creation myths, as it serves to (re)generate life (Fagan 2009).

This dialectic is not relegated to myth, however; all civilizations were founded in flood-prone areas like floodplains, monsoon regions, and coastal areas (Fagan 2009; Humphries et al. 2016). While floods may destroy infrastructure and crops, in doing so they also fertilize soil and end droughts, allowing agriculture; thus, in reality as in myth, the very process of destruction also facilitates creation (Baldassarre et al. 2013; Doe 2006). This unique dynamic makes floods both feared and revered across cultures; Ancient Egyptians commemorated the annual Nile Flooding and even today people in South and Southeast Asia celebrate monsoon season (Fagan 2011). Thus, while floods can decimate civilizations, they can also generate them, and are thus “worth the risk” (Doe 2006). This real-life destruction-creation cycle likely formed the basis for myth.

5. Climate Change as Flood Myth

Today, we face a flood of our own, and it mirrors the floods of myth. The discourse and facts of rising sea levels and the resulting modern deluge fit well into the typology of the flood developed by this study. Much like Ea, Prometheus, and Tane warned humankind, climatologists have been predicting the global flood for decades, with the help of non-human scientific procedures (Doe 2006). Further, this flood is posited as a direct consequence (“punishment”) of the pollution, wastefulness, and unsustainability produced by global capitalism (Doe 2006; Salvador and Norton 2011). In addition, scientists predict that few people will survive; already we are seeing casualties of climate change (Doe 2006).

Thus, climate change discourse shares much of the repertoire of flood myths. It departs from cross-cultural mythical conceptions, however, in that narrations of climate change focus solely on the destructiveness of the deluge, ignoring the regenerative social and geological aspects (Salvador and Norton 2011; Webster 2013). This “apocalyptic discourse” (Salvador and Norton 2011) undermines activism efforts with its discouraging all-or-nothing approach; either we avert the flood, or we all die (Humphries et al. 2016; Webster 2013). Further, it focuses on stopping the flood rather than surviving it (ibid.); in contrast, preparation for the disaster, and adaptation to a new post-flood climate, played a major role in the flood myths discussed earlier in this paper. This modern fixation on aversion, rather than adjustment, hinders the recognition of generative aspects of the flood, preventing inclusion of questions of repopulation, acclimatization, and rebuilding in strategies to address climate change. Climate change is thus an “incomplete” flood myth; it focuses on the “destruction” aspect, and ignores the “creation” part, of the destruction-creation cycle. Discussion of creation and regeneration must be added to the discourse, not only to complete the myth but, more importantly, to modify our approach to combating climate change and thus increase chances of survival.

6. Conclusions

The three floods analysed in this paper demonstrate that cross-culturally, flood myths can be similarly classified based on four shared features. Further, deluge myths characterize floods as part of a cycle of destruction and creation, with a focus on the generative aspects of the flood. Through an application of this analysis to climate change discourse, I argue that it shares many of the fundamental features of flood myths, but focuses disproportionally on destruction; this discourse must be reshaped to more holistically represent the next Great Flood.
See the Kovacs (1989) translation of the Epic of Gilgamesh, as well as Withington’s (2013) analysis of Mesopotamian flood myth for more details and cross-cultural comparisons of the story of Utnapishtim.

Some versions also posit Zeus as the King of the Gods; see Smith (2014) for an in-depth analysis of different historical and modern interpretations of Deucalion’s Flood.

References


http://nzetc.victoria.ac.nz/tm/scholarly/teiWhi01Aci.html
Reconsidering the Oppression of Women in the West vs. the Rest

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Abstract
Many women in western contexts tend to understand “oppression” in a very specific, and rather limited framework. Many tend to think of physical and material subjugation to which they themselves are less likely to be exposed. Nonetheless, oppression can have very real, damaging effects on Western women as well. This article questions this seeming contradiction through the analysis of an ethnographic interview with a 21-year-old, cis-gendered, Caucasian woman. It explores Western women’s perspectives on “oppression,” and its impact on notions of free will, gendered behaviours, and their perception of traumatic life events. Using findings from this interview, this article argues that understandings of women’s oppression need to be further complicated to include more subtle workings of power. In so doing, the article brings ethnographic data into conversation with key thinkers in the anthropology of gender, including Janice Boddy, Saba Mahmood, and Judith Butler. This theoretical framework informs key interview findings, including considerations of the interviewee’s agency and the presence of societal expectations that set behavioural parameters and encourage self-responsibility in traumatic life experiences. The article demonstrates how both material and subtle, taken-for-granted forms of oppression exist in the West and need to be acknowledged.

Keywords: Gender, oppression, agency

1. Introduction
“I don’t think of what we go through as oppression, because real oppression looks far worse, where people in third world countries have their rights to safety and shelter taken away.” The certainty with which my interviewee, who is a 21-year-old Canadian woman, phrased her understanding of “oppression” captures how this concept is often understood in Western contexts. We are accustomed to framing “oppression” as only occurring when an individual is being explicitly coerced or forced into performing a certain behaviour. In fact, Janice Boddy (2016) explains that women in North America in particular negate the idea of oppression in the West, and instead conceive it as far more pervasive in other societies, like those in Africa. While Western women are accustomed to viewing oppression through these lenses, I argue that these often taken for granted understandings of oppression need to be complicated by taking into account political as well as material forms of oppression. These supposedly more subtle forms of oppression meaningfully impact Western women and the choices they make. To convey this argument, I will first explore the theoretical concepts of oppression, agency, performativity, and deconstruction, as well as how prevalent these concepts are for women in the West. I will then introduce my interviewee and contextualize her life experiences to reveal the material forms of oppression Western women face, and the implications of this oppression on ideas of agency/resistance, and notions of femininity. Lastly, I will demonstrate how the subtlety of oppression disguises its workings in in Western contexts, such that it often goes unrecognized.
2. Revisiting oppression

First, an in-depth, theoretical understanding of how oppression is viewed in the Western world, as well as the implications this domination has on performativity, deconstruction, and agency, is required. The concept of oppression needs to be put into the appropriate perspective to be able to discuss the all-important material and subtle forms of domination. Material oppression involves a tangible manifestation, occurring as a result of an individual being forced into a particular action. On the other hand, subtle oppression is the underlying workings of society that are politically charged and shape our behaviour without us even knowing.

To contextualize domination between different cultural settings, Boddy (2016) provides a thorough comparison between the practices of female genital cutting (FGC) among the women of Sudan, and female cosmetic genital surgery (FCGS) among American women. Boddy (2016) argues that these two practices are essentially similar to each other. For instance, one type of female cosmetic genital surgery in the West known as “The Barbie” even renders the appearance of the vagina similar to those of Sudanese women post-FGC. To further support her claim, Boddy (2016) shows that Western attitudes toward this Sudanese practice assume these women must have a lack of agency. Westerners assume Sudanese women are being oppressed, or socially forced against their will, to take part in FGC, and, particularly, in subsequent restichings post-childbirth. On the other hand, vaginoplasty is becoming more common among North American women. Rather than a result of coercion, these women explain their vaginal reconstruction as their own choice, as a means of empowerment and reclaiming their sexuality and thus the result of free will.

Saba Mahmood (2001) has problematized this claim to “free will,” as opposed to “oppression.” She argues that agency, in Western contexts, has been perceived as the ability to follow one’s own interests and desires against the pressures of tradition, custom, or other obstacles. This expression of a “free will” is often perceived as uniquely Western, whereas “other” women are viewed as oppressed by patriarchal norms. She suggests, however, that the idea of “free will” is the product of its own historical context. We are all, in some way, submitting to particular discourses and ideologies.

Mahmood’s argument directly links to Judith Butler’s notions of performativity and deconstruction. Butler’s “performativity” refers to the idea that individuals do not simply choose how they express their gender, but rather repetitively perform behaviours that conform to or resist societal gender norms, and thus that actively shape the gender of an individual (Butler, 1997). Thus, Westerners, including Western women, follow specific, gendered behaviours, but believe that this is their choice. Also, in accordance with Butler’s concept of “deconstruction,” Western women push back against the categories they live by in their physical bodies, while maintaining the view that it is their unique agency that allows them to do so (Butler, 1997). This notion of “resistance” by Butler shows that there are political aspects associated with the agentive behaviour Western women live by. Overall, Westerners deny the lack of agency in West, but also deny the lack of oppression in non-Western societies like Sudan. To look deeper into these politics surrounding agentive behaviour, as well as the emphasis on the self as showcased by Western women, I conducted an ethnographic interview.

3. The ethnographic interview

The purpose of my ethnographic interview was to explore views on oppression by Western women. Specifically, I wanted to understand how their views of oppression affect other aspects of their life, including their experience of free will and gendered behaviour. Lastly, I wanted to see how views of agency and oppression played a role in how Western women perceive traumatic life events.

My interviewee Grace was a 21-year-old, cis-gendered, Caucasian female completing an undergraduate degree as a CCIT (Communication, Culture, Information and Technology) and Professional Writing double major at the University of Toronto, Mississauga (Canada). I chose to interview Grace in particular because she shows a strong belief in her own agency, self-responsibility, and the presence of choice in regard to her life experiences. As she dealt with and overcame issues with body dysmorphia and an eating disorder in her adolescence, I wanted to understand how Grace saw her own traumas and body dysmorphia in relation to questions of choice or external, societal pressures. I
especially wanted to learn more about Grace’s thoughts on notions of oppression, free will, and performativity in analyzing these experiences, and how she would address the presence of subtle forms of oppression in the West.

Grace’s responses addressed various inquiries surrounding domination, and displayed how material oppression is definitely present in her life. Upon asking how she understands the concept, Grace framed oppression as being a material, recognizable force with profound, negative effects on an individual’s behaviour in society, while still acknowledging the possibility of unseen, subtler forms of domination being present. However, Grace emphasized that only explicit, clearly negative action (material) can be given the label of oppression in confidence. This was apparent when she stated:

“The word oppression seems very severe and for me, means being forced to do something against my will. All I know is that I’m more comfortable using the word oppression when people have severe things like human rights taken away.”

Interestingly, this wording and conceptualization of oppression by Grace ties into an argument of Leila Ahmed (1982), which brings the Western origins of this form of thinking to the forefront. Ahmed (1982) explores the assumptions Westerners make about the supposed “backwardness” of Islamic societies, and the alleged physical and material subordination of Arab women by men (Ahmed, 1982). Ahmed (1982) shows that this stereotypical view of oppression derives largely from Western perceptions of how men in non-Western, Islamic cultures treat women. Thus, Western society has been trained to recognize only material forms of visibly inhumane activity and subordination as oppression. Nonetheless, this material form of oppression is something Grace suggested as being present in her life as well. When asked where her body dysmorphia and eating disorder stemmed from, and if she faced any domination that lead to these occurrences in her life, Grace provided details that are in line with the ideas expressed by Ahmed (1982).

Grace explained that from a very young age, she always received attention from boys. One instance Grace speaks on is shopping for a raincoat with her father at the age of 10. Grace picked out a black raincoat from the boy’s section, specifically because it was less visually bright and disturbing than the options in the girl’s section. However, Grace’s father forced her to get a pink jacket instead, because he felt that clothes with stereotypically female colours, such as pink, would be more appropriate for Grace.

Ultimately, Grace admitted the presence of material oppression in her life. She explained:

“The only type of thing I feel comfortable calling oppression is the male gaze that was on me ever since I was a little girl … my parents expected me to be more and more girly which meant things like wearing pink even though I didn’t want to … people were telling me what I can and can’t do, and what to do to be more ‘feminine’ and please the male gaze.”

From this example, it is evident that it was Grace’s parents who enforced a certain gender norm onto her, even though she initially did not even consider her gender’s role in this situation. Individuals like Grace’s parents enforced specific, recognizable (material) restrictions on her ways of being as a gendered individual, so she could be more likeable to boys, and in a way, more acceptable for the male gaze. In summation, the male gaze was the material oppression that surrounded Grace, and it influenced her life in ways that resulted in the placement of visible restrictions around her choices.

Reflecting on her life experiences, Grace shows that material oppression was not only present in her life, but it also had a profound effect on other important aspects of her life such as her views of her own femininity, the choices she made, and her performance of gender. For example, Grace recalls not feeling able to wear dresses or the colour pink after investing more heavily into male behaviours, mentioning:

As soon as I identified as a tomboy, I couldn’t wear pink or dresses because now, after I started acting differently to resist the male gaze, I signed myself up for a whole new set of norms. But my free will was still restricted by this gaze and by the norms around me.
Therefore, responding to her material oppression, the male gaze, led Grace to perform key, gendered actions, including acting as a tomboy. This response placed a new set of parameters around Grace’s agentive behaviour, and if she could follow typically feminine norms. Clearly, the presence of material oppression, the male gaze, and performing actions in relation to this gaze, steered Grace in a direction that had ramifications on her notions of femininity and agency. Although this discussion of material forms of oppression is necessary, it needs to be further complicated by considering the workings of subtler forms of oppression as well.

In fact, the understated, political mechanisms of domination are prominent and often most powerful, yet frequently go unnoticed. Michel Foucault made this argument in his theorization of the workings of power, and his example of the panopticon (Browne, 2015). The panopticon, as a prison watchtower, explains how people willfully subject to the workings of power, as docile bodies. Foucault argues that prisoners surrounding a central watchtower are under the conception that they are being continuously watched by the watchtower’s guards (Browne, 2015). Thus, Foucault suggests that under the perceived idea of constant surveillance, the prisoners will diligently perform their best behaviour to avoid the repercussions of deviance (Browne, 2015).

These notions of constant surveillance and resultant docile bodies – the subtly shaping of individuals’ behaviour – can be extended to the behavioural patterns of Western women as well. However, Western women fail to recognize this indirect domination as even being oppression at all. For instance, in her interview, Grace claims that oppression is a concept that is quite foreign to the Western world, saying,

“I don’t think of what we go through as oppression, because real oppression looks far worse, where people in third world countries have their rights to safety and shelter taken away.”

Through Grace’s claims, several important points become apparent. First, there are distinct influences as to why Western women do not identify the subtle expectations integrated into Western culture surrounding gender norms and the subordination of women, as oppression. In the case of Grace, this is partly because she has a heightened appreciation for the power white, educated women have in Western society. Because of this increased privilege and control, Western women like the interviewee do not see themselves as being forced to conform to gender norms, as there is no explicit loss of rights or control, for example. This increased awareness of privilege and control displays the self-awareness women in the Western world have. This need to critically monitor their behaviour among these women is similar to the actions of the prisoners described in Foucault’s watchtower (Browne, 2015).

Interestingly, when discussing Grace’s experiences with her eating disorder, several influences of subtle, political oppression became even more apparent. Grace explained that with respect to the body dysmorphism she developed, her athletic lifestyle placed extreme stress on her body, as well as how she perceived her physical health. One specific instance Grace recalls is her father patting her on the back and jokingly asking, “Is that a roll?” Grace also describes another occurrence, when her mother compared how different Grace’s body type was from her sister’s:

Comments people would make that I would take it too seriously…Dad said patting my back, “is that a roll? I took this too seriously even though he was just joking …I always had a different body type than my sister, who mom called, “the skinny one.” So I asked myself what that makes me?

Intriguingly, as Grace began to think more critically on such dialogue with others she recognized how this played a significant role in her becoming much more body conscious.

However, when asked if she felt her eating disorder was a personal choice, or a result of other pressures like gender norms, Grace also explains it occurred largely because she could not properly understand how to balance an active lifestyle with a healthy calorie intake, leading to issues in body-perception. Grace specifically stated:

I wasn’t forced into anything, I just didn’t know about how your body uses energy just to live, so I took extraordinary measures that at the time I didn’t even see as extraordinary measures …. It was a very self-centered disease; the only time I compared myself to others was because I couldn’t tell what I actually looked like, so gender norms didn’t really affect me.
From Grace’s descriptions, both general surveillance (apart from the attention from males mentioned previously) and personal influence played a critical role leading up to Grace’s body dysmorphia and eating disorder. This example exemplifies how in a society where surveillance is subtle yet constant, the emphasis and responsibility is placed on the self; it is the consequence of your own choices. On the other hand, the people in society watching, just like the watchtower guard watching the prisoners in Foucault’s panopticon, are hard to see or definitively locate (Browne, 2015).

Also, by avoiding placing the blame for the occurrence of her eating disorder and dysmorphia on anyone other than herself, Grace gave responses that were very politically correct. This idea is apparent when she says,

“I acknowledge my privilege and act accordingly to not point fingers at anyone or generalize my experiences with others or offend people. Whenever women in our society speak out, even accidentally, we get called a menace because I guess we’re not submissive enough or something.”

Thus, Grace displayed a sense of carefulness here, as if in fear of being socially shunned by an invisible, yet all-seeing, judgemental force.

These invisible, yet omnipresent workings of oppression, and the damage they cause, can be put into context through a look at Popenoe’s work (Popenoe, 2005). Popenoe (2005) speaks on alternate perceptions of body ideals as practiced by Arab women in Niger. In this culture, Popenoe (2005) highlights that Nigerian women are not blamed for not achieving female body ideals. Instead, poor external factors are seen as the culprit. However, this idea is in stark contrast with the negativity and judgement women feel for straying from acceptable gender norms and societal codes of conduct in the West. Living in this fear of being publicly eschewed can be damaging and play a hand in the development of a variety of traumas. Thus, these societal expectations, which are charged politically to promote a particular set of norms to women, correspond with a form of subtle oppression that can be quite damaging to the lives of women like Grace.

4. Conclusion

Western women are used to thinking of oppression as something visible, tangible, and material. But in actuality, it can be subtly built into the very nature of how these women live their lives. As evident through an analysis of the ethnographic interview with Grace, the impact of subtle, in addition to visible, material forms of oppression, are clear. Furthermore, comparisons to experiences of women in other cultural contexts demonstrate how women in the West are often exposed to much more extensive forms of domination than is often recognized. Concepts like agency and domination can therefore never be understood as some view of the West vs. the Rest, but rather require nuanced and contextualized approaches to forms of oppression.
Alternatively, some may find it helpful to conceptualize “material” oppression as “explicit,” wherein the dominant party *expressly* imposes an ideology upon the subordinate party, and “subtle” oppression as “implicit,” wherein the behaviour of the dominant party *suggests or pressures* the subordinate party to conform to an ideology, but does not state it outright. However, I prefer “material” and “subtle” as “explicit” carries a connotation of being exclusively verbal, while “implicit” carries non-verbal connotations, both of which are not necessarily accurate.

ii. This is a pseudonym to protect the interviewee’s privacy.

References


Pots and Plants: Statistical Analysis on Pottery Changes from Epi-Jomon to Okhotsk, Kuril Islands.

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Abstract
This study examines the relationship between pottery and food procurement strategies in northern Japan, focusing on the Epi-Jomon and Okhotsk cultures. Using these two cultures as loose representatives of different subsistence strategies, the study attempts to explore possible relationships between pottery type/decoration (namely cord marking) and agriculture. This over arching hypothesis is supported by three smaller hypotheses for statistical analysis: 1) testing the independence between decoration and cultural phase using the chi-squared test; 2) thickness (mm) of pottery through different time periods using the Kruskal-Wallis test; and 3) thickness of pottery depending on pottery types using the Kruskal-Wallis test. The first test showed that pottery type and cultural phase are not independent of each other ($\chi^2 (36, N=295) = 608.35, p < .001$). The second test showed significant difference in thickness measurements between time periods ($H \chi^2 (5, N=343) = 27.13, p<.001$). The third test also revealed similar significant difference in thickness measurements between pottery types ($H \chi^2 (16, N=476) = 63.44, p<.00$). In combination, results suggest a statistical correlation between pottery and subsistence strategies, specifically cord-marked pottery and intensified food production. Further research, ideally between Jomon and a more agricultural society such as Satsumon, is needed to clarify this relationship.

Keywords: archaeology, subsistence, cord marking

1. Introduction
There is an arguable correlation between pottery and agriculture, in how the former changes and relates to the latter (Craig et al. 2011). One of the more nebulous trends in pottery we find is that of cord marking, in the sense that cord markings are more prevalent in societies which did not primarily focus on agriculture as a food way practice (Crawford 2000). Though this phenomenon is not particularly well studied and based mostly on observations, some link between the two variables seem to exist within Japanese pottery, during the transition between Jomon culture (~14,000–300 BCE) to later Yayoi period (~300–300 AD), which was prompted by colonization from the (now Korea) mainland (Crawford 2000). Cord marking is a characteristic trait of Jomon pottery, and they were known to have a unique food pathway system that did not rely heavily on agriculture (Crawford 2011). They practiced a mix of hunting, foraging, some crop cultivation, and use of marine resources (Craig et. al 2013) that was successful for thousands of years which could be defined as niche construction (Crawford 2016, Crawford 2018) or low level food procurement/producing (Smith 2001) that never fully embraced our traditional concept of agriculture. As the period turned over to the Yayoi and its more substantial agricultural practices, cord marking drastically decreases in frequency in the archaeological record, and this is a trend that does not seem to be exclusive to this region alone - North American cord marking pottery from Woodland and...
Princess Point was also replaced by incised pottery by the later Iroquoians (Crawford 2000). The cross-regional nature of this trend makes for a worthwhile study of what may be the underlying mechanisms behind pottery and agriculture.

In this context, the main hypothesis this paper addresses is whether or not agriculture (or perhaps more broadly a different subsistence strategy) has any discernible effect or correlation on the use of cord marking on pottery. This hypothesis is based on three assumptions (a possible confounding factor to be discussed later): 1) the intensity of agricultural practices impacts the manifestation of pottery, such as in dimensions (thickness) and pottery type. Elements of this first assumption have roots in studies such as Craig et al (2011)'s research on culinary practices and agriculture. 2) The Jomon culture, though not completely devoid of crop cultivation, has less intense association with the practice and the cultural phase is therefore - for the purposes of this paper - used as a reference for such. 3) By contrast, in this paper, Okhotsk time periods represent a period where agriculture is comparatively more intensified, as it was described as having crops (such as barley) and domesticated boar though their subsistence relied heavily on marine resources and does not follow the traditional dichotomy between hunter gatherers and farmers (Crawford 2011; Leipe et. al 2017).

2. Materials and Method

The data is derived from Gjesfjeld's (2014) dissertation on the pottery production and social networks within the Kuril archipelago, which was in turn collected by a third party from the Institute of the Earth’s Crust at the Russian Academy of Sciences. The two datasets provided included descriptive measurements, decoration type, cultural phases/occupation (mostly Jomon and Okhotsk) and radiocarbon dates, organized by site (KBP-Pottery: Descriptive Measurements: tDAR id: 393044; doi:10.6067/XCV89C6ZCQ). The author does not distinguish between technique, surface treatment, and motif/decoration, instead collapsing them into one group (Decoration Type), because it is not clear in the original dataset how the three categories can be distinguished. Therefore, for the purposes of this paper this group will be renamed "Pottery Types" to avoid confusion with the term "Decoration", and be analysed altogether.

The aforementioned main hypothesis is investigated using three smaller hypotheses that will hopefully build up and strengthen the argument. The first hypothesis examines whether or not pottery type and cultural phase (with Jomon phases assuming little agriculture) are independent variables with no association between them. Given the nominal, categorical nature of the data, the best test chosen was the chi-squared test. The Chi-squared test allows us to examine the independence between two categorical variables (Drennan 2009). Contingency test tables for both observed and expected tables were created, as well as Cramer's V to test the strength of the association and Yate's Continuity Correction since over 20% of the data from the previous expected frequencies table were less than 5. Only data with both pottery type and cultural phase/occupation values were utilized, and among that, missing data ("N/A" values) in any of the categories were removed.

The second hypothesis examines how thickness of pottery changes through time. Pottery wall thickness is often known to be associated with cooking practices and other functional purposes (Braun 2010, Gjesfjeld 2014). Changes in thickness through time (as it relates to cultural phases) may indicate a shift towards certain practices, especially during the Epi-Jomon/Okhotsk transition, which may imply, for example, intensified, purposeful agricultural practices. Data with both thickness (mm) and date values were used, with "N/A" values removed. Because the calibrated dates listed on the main dataset by Gjesfjeld contained many overlaps, they were combined as best as possible into individual categories. Summary statistics were conducted on segregated thickness data based on age (date range; BP - before present). Shapiro-Wilk Normality test and QQ plots were then separately done on each date range's dataset (Appx. 1), to determine whether a parametric or nonparametric test should be conducted. As some of the date ranges were not normally distributed (Ranges 750 - 1000; 1400 - 2000; 2720 - 4500), a Kruskal-Wallis test was then conducted to test the significant differences between samples. Following this, post-hoc pair-wise tests were performed to identify which date ranges
were driving the significant differences between samples, with Bonferroni corrected p-values table used to determine significance.

The final hypothesis is focused on how pottery type affected thickness. Similarly to the test described above, data with both thickness and pottery type values were used, "N/A" values were removed, and summary statistics were applied to the dataset from separated groups. As with above, a Shapiro-Wilk Normality test was performed to ascertain which test should be used (Appx. 2), and due to the data not all being normally distributed a Kruskal-Wallis test was conducted. A series of post-hoc tests with Bonferroni corrected p-values were used to further examine in-depth the differences between pottery type. All statistical tests were conducted at an alpha value of 0.05.

3. Results

Hypothesis 1: Independence between Pottery Type and Cultural Phase

The results of the Chi-squared test conducted on the frequencies in Appx. 3 shows that pottery type and cultural phase are not independent, χ² (36, N=295) = 608.35, p < .001. This means that there is an association between decoration and cultural phase. This result is also consistent with the Yate’s Continuity Correction to account for the fact that many of the cells in the contingency table consist of frequencies below 5. To further investigate this association, Cramer’s V was used to measure the strength of the relationship or effect size between decoration and cultural phase. Since the value obtained is close to 1 (Cramer’s V = 0.72), this indicates a strong association between the two variables.

The graph in Fig. 1 clearly shows the association between certain pottery types with a cultural phase. Early Epi-Jomon and Epi-Jomon are dominated almost entirely by cord marking, whilst this type of pottery is completely absent in the later Okhotsk periods. Likewise, the pottery types present in Okhotsk is absent in Epi-Jomon phases, and also show higher diversity of type. The graph of Fig. 2 offers an alternate arrangement of the data that shows which cultural phase exhibited each pottery type. Cord marking almost exclusively appears in Epi-Jomon associated phases.

Hypothesis 2: Vessel Thickness throughout Time

Along the same vein as the first test, the Kruskal-Wallis test conducted on thickness measurements when divided by date (Appx. 4) shows significant difference between time period/date ranges; H χ² (5, N=343) = 27.13, p<.001. This implies thickness varied significantly between time periods, with a general trend of increasing thickness as time passes. Support for this is seen in the Bonferroni corrected p values (Table 1) which highlights difference between individual sets of date
ranges and emphasizes the significance especially between early and late time periods. We can therefore reject the null hypothesis that states there is no significant difference in thickness between each date range.

The graph in Fig. 3 shows the variance between thickness measurements found in each time period. Half the groups (0 - 700 BP, 1100 - 1300 BP, and 1400 - 2000 BP) contain outliers. The overall trend shows an increase in pottery sherd thickness with time, though it is not consistent - the maximum average peaks at 1100 - 1300 BP, then subsequently decreases, though the averages of the later time periods are still higher than before. Also, the standard deviations and ranges (Appx. 4) does share significant overlap.

Table 1. Bonferroni corrected p values table for date ranges on thickness

<table>
<thead>
<tr>
<th>BP</th>
<th>0-700</th>
<th>750-1000</th>
<th>1100-1300</th>
<th>1400-2000</th>
<th>2100-2700</th>
<th>2720-4500</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-700</td>
<td>0.94</td>
<td>0.20</td>
<td>0.36</td>
<td>0.32</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>750-1000</td>
<td>0.05</td>
<td>0.10</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>1100-1300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1400-2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.89</td>
<td>0.05</td>
</tr>
<tr>
<td>2100-2700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.07</td>
</tr>
<tr>
<td>2720-4500</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3: Vessel Thickness based on Pottery Type

Results of the Kruskal-Wallis test performed on thickness measurements based on pottery type (Appx. 5) reveals similar significance of difference between sample medians $H \chi^2 (16, N=476) = 63.44$, $p<.001$. More in-depth examination of the Bonferroni corrected p values (Appx. 6) shows significant difference between cord-marking and two other pottery types (incisions and none), emphasizing the disconnect between the common pottery types found in each time period and cultural phase. We can thus reject the null hypothesis that states there is no significant difference in thickness between each pottery type.

The variety and dissonance of thickness measurements is highlighted in the boxplot generated (Fig. 4), revealing to us the possible association between thickness and pottery type. Four groups (applique, cord marking, incisions, and none) contain outliers, in which two of them (cord marking and incisions) seem correlated with distinct cultural phases (Epi-Jomon and Okhotsk, respectively). Though the ranges overlap, the average and majority of thickness measurements in incision pottery style is higher than cord marking.

4. Discussion

The results of the first test showed there is a strong association, according to Cramer’s V, between pottery type and cultural phase, which can already be seen by looking at the data alone. The bar charts (Fig. 1, Fig. 2) on the raw data shows cord marking is almost exclusive to Epi-Jomon culture, and is completely absent in the Okhotsk period. In fact, the cultural occupations share almost no decorative style. This marks a ready and strong statistical connection between agriculture and cord marking. Based on this finding, we can infer the association may have arisen from the introduction of agriculture or, at the very least, other cultures, which marked the decrease of cord marking on pottery vessels.

The second test shows that thickness of the vessel is significantly different across data ranges. The boxplot (Fig. 3) seems to convey that thickness increases to the more recent era, albeit slightly and with many outliers. Examining the Bonferroni
corrected values (Table 1), however, we can see that most of the significant differences come from more opposing date ranges - i.e. more recent date ranges are more significantly different than older dates, and so the idea that thickness increases with time is better supported. From the statistical association we can infer a number of things - wall thickness relates to function, most often in the realm of cooking (Braun 2010, Gjesfjeld 2014). While change in thickness, and therefore cooking practices, cannot be directly attributed to intensification of agriculture, Gjesfjeld (2014) had noted that wet rice agriculture became more established in Northern Honshu at 1800-1500 BP. In the Bonferroni corrected values table (Table 1), this date range marks a significant difference with newer dates, which may speak to how cooking or other heat retention functions of pottery became more intensified and varied, or how agriculture itself became more the norm in terms of food pathways. Additionally, this also marks the period where we see, afterwards, an increase in the mean at 1100-1300 BP, an increase that contains the highest mean thickness of all the data groups. The very least we can conclude from this is that some difference or event triggered the increase of wall thickness that was relatively stable before - perhaps a displacement of, or change in, pottery form/technique.

The third test revealed that the thickness of pottery vessels are also significantly different between pottery types. The boxplot (Fig. 4) shows that the mean thickness of cord marking (albeit with many outliers) is lower than all the more recent date ranges (0-1300 BP) but about the same or more than older ranges (1400-4500 BP). This loose statistical correlation can be connected as thus: assuming wall thickness increase is prompted by an event, such as agriculture, the absence of cord marking at later periods and also smaller wall thickness values implies an association between agriculture and cord marking, with wall thickness acting as the medium between the two. We can see in the boxplot (Fig. 4), however, that wall thickness
seems to heavily vary across all pottery types, so this association, already admittedly loose, is looser still. Incisions on pottery, which is more associated with the Okhotsk, has a higher wall thickness range and mean average, which may support our argument. Though the Bonferroni corrected p-values table (Appx. 6) show little significance between pottery types, cord marking is highlighted by its significance with incisions and no pottery type. Another avenue of interpretation departing away from the agricultural assumption is that pottery type could be related to subsistence strategies, considering how the Okhotsk culture is primarily associated with a marine subsistence (Naito et. al 2010). The practical response could be seen in wall thickness as well, which may have affected processing of their food resources, though exactly how needs further research.

There are a number of issues one should be aware of that is inherent, inevitably, in this paper. The most direct issue first of all is that a statistical association does not necessarily reflect a true, archaeological association, only a basis for us to derive assumptions for our argument. Even with strong statistical associations, we could not extrapolate direct causal relationships between variables. Secondly, there are the assumptions and the amount of indirect testing required to support the main hypothesis, which are confounding variables that may have led to bias in how results were interpreted. Subsistence strategies and cultural change was not as clear cut as this paper posits, and assuming Jomon has little agricultural practices whilst Okhotsk has more intense practices is an oversimplification of the true processes that took place during these cultures and evokes the arguably harmful binary of hunting-gathering/ agriculture required to create such hypotheses. The "level" of agriculture in Okhotsk may not actually be substantially "higher" than Epi-Jomon, and both could possibly fall into the spectrum of low level food production described by Smith (2001). Even if their practices differed to a comparable extent, the differences in pottery type could simply be a product of two different cultures instead of a transition from one to another - though we would still be able to argue that pottery types share a correlation with subsistence strategy. If the data were to contain pottery measurements from the Satsumon period, however, the more prevalent continuity from Jomon to Satsumon (Crawford 2018) would strengthen the original assumptions. The lack of a clear cultural transition therefore weakens the paper's argument.

This leads to the uncertainty in arguing that change in pottery type is directly related to agriculture because there is a possibility it may have been a tradition brought in by a whole other distinct culture. Okhotsk is not a culture descended linearly from Jomon, so despite what interactions may have occurred between them, a clear transition cannot be defined. Most of the data came from different sites, making it difficult to compare when trying to find a consistent trend. Further, the original dataset itself is missing many details for our purposes. As mentioned before, the dataset required the analyses to be done without differentiating between technique, surface treatment, and motif/decoration, which are distinct categories that merit their own individual statistical analyses. By calculating them all in the same group, we risk analysing traits that are incomparable and inconsistent, since they do not represent the same process in ceramic crafting. For instance, wall thickness could be affected differently depending on surface treatment and technique, and by analyzing them all together we lose the nuance of this variation. A thinner wall could be because of cord markings, or it could be due to the technique used to create the vessel, or both. Secondly, there is no (or almost no) variation in pottery type within the same cultural phase. While homogeneity supports our argument, it also means more powerful statistic tests such as a two way ANOVA, or any parametric test, are inhibited from use as the data cannot support that type of test. A two-way ANOVA would have been especially useful in this case to examine the relationship between pottery type and cultural phase. Groups used in the second and third hypothesis also vary in size, sometimes by over hundreds, and the date ranges are not of consistent space (though that is in issue with the original data). Categorical data such as that mainly used in this study restricts us from finding regressions and correlations, and the nonparametric measures
utilized due to both the categorical and generally non-normally distributed nature of the data further inhibits better testing. All this makes for a relatively weak argument in regards to the main hypothesis, but that only means there is much room for improvement.

5. Conclusion

We can overall conclude that although obscure in how the two are connected, cord marking/pottery type and subsistence strategy do seem to share a relationship, and that thickness dimensions seem related to pottery type as well. It is important to keep in mind, however, that although the data show significance of difference, the assumptions set up as well as the nature of the data puts into question whether the hypothesis can be answered definitively. Much more research and data will need to be conducted to truly outline this relationship and clarify the many points of contention and assumptions laid out to test it. Much more data is needed to conduct the kind of test (such as a two-way ANOVA) that would be beneficial to the hypothesis of this study, especially data between cultures with a stronger lineage. The importance of this study lies in its universality and ubiquity - not only is this phenomenon not exclusive to this region, but the appearance and changes of pottery and dietary pathways can be seen everywhere in the archaeological record. The potential for broad comparisons makes such phenomena worth studying, because what we share with other people, what archaeological cultures share with each other, is what connects us and is what may shed light on some fundamental truths and similarities in human and cultural evolution. Of course, we should always consider the perils of over-generalizing, but if not in theory, then in technique - examining pottery and subsistence relationships in other assemblages could provide us with insights on how the two interacted and changed each other. We are at a point in archaeology where there is an abundance of pottery and botanical/ecological/dietary data to be examined together, to offer new perspectives of the past.

Acknowledgements

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Gjesfjeld, Erik W. 2014. *Of Pots and People*:
Investigating Hunter-Gatherer Pottery
Production and Social Networks in the Kuril Islands. PhD diss., University of Washington.


Appendices / Supplementary Information

Title: “Pots and Plants: Statistical Analysis on Pottery Changes from Epi-Jomon to Okhotsk, Northern Japan”
Authors: Casey Lun

Appendix 1. Shapiro-Wilk Normality Test Table for Thickness based on Age

<table>
<thead>
<tr>
<th>BP</th>
<th>AGE 0-700</th>
<th>AGE 750-1000</th>
<th>AGE 1100-1300</th>
<th>AGE 1400-2000</th>
<th>AGE 2100-2700</th>
<th>AGE 2700-4500</th>
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<tbody>
<tr>
<td>N</td>
<td>18</td>
<td>88</td>
<td>64</td>
<td>72</td>
<td>65</td>
<td>33</td>
</tr>
<tr>
<td>W</td>
<td>0.93</td>
<td>0.97</td>
<td>0.99</td>
<td>0.88</td>
<td>0.96</td>
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<tr>
<td>p(nor)</td>
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<td>0.81</td>
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<td>0.02</td>
<td>0.69</td>
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</table>

Appendix 2. Shapiro-Wilk Normality Test Table for Thickness based on Pottery Type

<table>
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<tr>
<th>Pottery Type</th>
<th>Early Epi-Jomon</th>
<th>Epi-Jomon</th>
<th>Late Okhotsk</th>
<th>Middle Okhotsk</th>
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<td></td>
<td></td>
<td></td>
<td>5</td>
<td>6</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Geometric</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>Relief</td>
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<td>1</td>
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<tr>
<td>Ridges</td>
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<td>Total</td>
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<td>7</td>
<td>4</td>
<td>15</td>
<td>171</td>
<td>295</td>
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Appendix 4. Summary Statistics for Thickness based on Ages

<table>
<thead>
<tr>
<th>BP</th>
<th>AGE 0-700</th>
<th>AGE 750-1000</th>
<th>AGE 1100-1300</th>
<th>AGE 1400-2000</th>
<th>AGE 2100-2700</th>
<th>AGE 2720-4500</th>
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</thead>
<tbody>
<tr>
<td>N</td>
<td>18</td>
<td>88</td>
<td>64</td>
<td>72</td>
<td>65</td>
<td>33</td>
</tr>
<tr>
<td>Min</td>
<td>6.1</td>
<td>5.7</td>
<td>5.44</td>
<td>5.1</td>
<td>4.98</td>
<td>5.57</td>
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<tr>
<td>Max</td>
<td>13.46</td>
<td>14.79</td>
<td>15.08</td>
<td>17.84</td>
<td>14.3</td>
<td>10.84</td>
</tr>
<tr>
<td>Sum</td>
<td>161.22</td>
<td>798.78</td>
<td>615.03</td>
<td>617.02</td>
<td>553.93</td>
<td>255.47</td>
</tr>
<tr>
<td>Mean</td>
<td>8.956667</td>
<td>9.077045</td>
<td>9.609844</td>
<td>8.569722</td>
<td>8.522</td>
<td>7.741515</td>
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<tr>
<td>Std. error</td>
<td>0.4311756</td>
<td>0.2185015</td>
<td>0.2355846</td>
<td>0.2457222</td>
<td>0.2616751</td>
<td>0.2256586</td>
</tr>
<tr>
<td>Variance</td>
<td>3.346424</td>
<td>4.201377</td>
<td>3.552008</td>
<td>4.47315</td>
<td>4.450801</td>
<td>1.68042</td>
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<tr>
<td>Stand. Dev.</td>
<td>1.829323</td>
<td>2.049726</td>
<td>1.884677</td>
<td>2.085022</td>
<td>2.109692</td>
<td>1.29631</td>
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<tr>
<td>Median</td>
<td>8.585</td>
<td>8.76</td>
<td>9.65</td>
<td>8.255</td>
<td>8.01</td>
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<td>75 prcntil</td>
<td>9.8175</td>
<td>10.53</td>
<td>10.935</td>
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<td>0.3147763</td>
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<tr>
<td>Kurtosis</td>
<td>1.273158</td>
<td>-0.09541889</td>
<td>0.07531634</td>
<td>5.755657</td>
<td>-0.08460147</td>
<td>-0.3264226</td>
</tr>
</tbody>
</table>

Appendix 5. Summary Statistics of Thickness based on Pottery Type

<table>
<thead>
<tr>
<th></th>
<th>Applique</th>
<th>Cord Marking</th>
<th>Denticles</th>
<th>Depression</th>
<th>Everything</th>
<th>Geocord Marking</th>
<th>Geometric Impressions</th>
<th>Incisions</th>
<th>Peak</th>
<th>Punctures</th>
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Appendix 6. Bonferroni corrected p values for pottery type on thickness

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The Benefit of Autopsies in Suspected Drug Overdose Cases, as seen in Nova Scotia, CA.

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Abstract

The current opioid crisis in Canada calls for accurate information on drug overdose deaths (DOD) to help formulate effective public health policy (Health Canada 2018). The effect of the lack of standardization on the comparability of mortality statistics in Canada has not be studied. One of the major issues regarding accuracy of DOD is whether suspected DOD should undergo an autopsy (Kelsall and Bowes 2016). This research analyzes the impact of performing an autopsy on the accuracy of determining the cause of death (COD) as drug overdose, by comparing putative COD with post-autopsy COD for each drug related death investigated by the Nova Scotia Medical Examiner Service (NSMES) in 2015 – 2016. The McNemar test results show a statistically significant difference between putative COD and post-autopsy conclusions ($\chi^2 = 16.17$, d.f.=1, p < 0.0001). The research concludes that determination of COD in suspected DOD without an autopsy could misrepresent DOD statistics. This study suggests that autopsies are necessary for the accurate classification of drug-related deaths and that a standardized nation-wide approach to this problem could be of significant benefit.

Keywords: forensic anthropology, opioid crisis, autopsy

1. Introduction

According to a National Report by the Government of Canada, the number of opioid-related deaths are growing in the country. There were 3,017 apparent opioid related deaths in 2016, 4,034 in 2017 and 3,286 in the first nine months of 2018 (Health Canada 2018). In the United States, from 1999 to 2017, 70,237 drug overdose deaths (DOD) have been reported by National Institute of Drug Abuse (NIH 2018). This growing crisis calls for accurate reporting of statistics to understand the magnitude and distribution of the issue to inform actions that reduce opioid related harm and deaths (Health Canada 2018). The availability and quality of relevant information is critical for public health policy to have a positive impact on illicit drug related mortality. Canadian Forensic Scientists have expressed concern about the integrity of mortality data and highlighted a need for improving the quality of medico-legal death investigations in the country (Kelsall and Bowes 2016). The final outcome of a death investigation is an opinion on the cause and manner of death, for which international guidelines are available. However, these practices are not adopted uniformly across Canada (Pollanen et al 2014).

One of the areas of concern is the lack of standardization in the decision to perform an autopsy in deaths that are unnatural or unexplained, and specifically whether all suspected DOD should undergo autopsy. These investigations are a provincial or territorial responsibility and the decision to perform autopsy varies across Canada (Kelsall and Bowes 2016). Across jurisdictions, there is a variation in the rate of deaths investigated annually from 7% - 45% (Kelsall and Bowes 2016). As well, there is a wide variation in autopsy rates (Kelsall and Bowes 2016). Cases where autopsies
are not conducted, and deaths are classified as “undetermined” may misrepresent statistics of DOD (Kelsall and Bowes 2016). Such misrepresentation can negatively impact the development of effective strategies to prevent drug related deaths.

There are differing views on performing autopsy in apparent drug related deaths. Conducting an autopsy, however, is a resource-intensive process, requiring substantial finances and human effort. In the United States, a significant increase in DOD has put stress in jurisdictions where autopsies are mandated as the maximum workload levels of pathologists are prescribed to meet accreditation requirements (Fowler 2017). Advocates of conducting autopsy in DOD cases argue that one of the challenges in determining DOD is post-mortem drug redistribution or the movement of drugs within the body after death (Fowler 2017). Some drugs can be falsely elevated in post-mortem blood and others may be falsely depressed and analysis of this material can thus be misleading (Fowler 2017). The difficulty of interpreting post-mortem blood concentrations without an autopsy illustrates the importance of autopsy in DOD investigations (McIntyre and Escott 2012).

Considering the increase in drug-related deaths in Canada, and the considerable resources necessary to perform autopsies, this paper investigated whether conducting autopsies improved the accuracy of cause of death conclusions in apparent drug related deaths in Nova Scotia. This research analyzes the impact of performing an autopsy on the accuracy of determining the cause of death (COD) as drug overdose, using Nova Scotia Medical Examiner Service (NSMES) data.

At the NSMES by longstanding practice, all deaths that are suspected as DOD during initial investigation, undergo autopsy. The NSMES is guided by the Fatality Investigations Act (FIA). The procedure for every autopsy is the same: a full external examination is followed by a full examination of all organs, which are removed, weighed, and examined (FIA 2001). The extent of the exam may vary depending upon the specifics of the case, and the decision is made by the medical examiner (FIA 2001). Additionally, ancillary testing such as toxicology, supplements the case information (FIA 2001). Toxicology reports are considered when writing the final death report, once a complete autopsy has been performed (FIA 2001). Toxicology reports can provide information on whether a deceased individual had drugs present in their system at the time of death, and in what amount (Watkins, Anderson and Rondinelli 2013).

The death investigation process at the NSMES begins with the case investigator attending the scene of death. Based on this initial investigation, putative COD is determined. All deaths with putative COD classified as “drug related”, undergo autopsy. Confirmation of death as DOD or not is made on the basis of autopsy with supplemental information from ancillary test reports.

2. Study sample

The sample selected for this study included all death investigations that underwent autopsy at the NSMES between January 1, 2015 and December 31, 2016, the two-year period with most recently closed cases. The number of cases in this sample was 1,498. These included cases that were suspected as DOD during initial investigations; confirmed as DOD post autopsy; as well as cases that were neither suspected nor confirmed as DOD post autopsy.

Data for this research was extracted from the Medical Examiner Application (MEA) database at the NSMES. The MEA maintains case information of all death investigations conducted by the NSMES. It contains reports and documentation from various agencies including the police and medical experts. Documents that are scanned and securely stored in the MEA include the decedent’s medical records, emergency hospital records, paramedic reports, and ancillary test reports. The MEA database is also used to record over 100 fields of data for each case. These fields of data summarize information from the scanned documents and records. The fields extracted from the MEA for this study were “year of death”, “death class”, “case status”, “autopsy performed indicator”, “final manner of death”, “immediate cause of death”, “anteceendent cause of death”, toxicology report summaries (blood alcohol, blood drug, blood carbon monoxide, urine alcohol, urine drug, vitreous alcohol, liver drug screen, stomach drug screen) and “other significant conditions”.

In the MEA, putative COD is recorded under the category “death class”. Deaths that are suspected to be drug related are classified as “drug related” under this category. There are five sub categories under “drug related” deaths: drug related alcohol; drug related - illegal drugs; drug related- polymorphic; drug related - prescribed drugs; and drug related - unspecified.
Cases that were included in the sample were classified as drug related - illegal Drugs; drug related – Polymorphic; drug related – Prescribed Drugs and Drug related – Unspecified were included in the sample. All cases classified as drug related – alcohol was excluded from the analysis. These cases were excluded as many of these deaths are due to the chronic effects of alcohol like cirrhosis of the liver. Since this study aims to address only acute drug overdose deaths, this category of deaths is not relevant. The variables used for analysis were “death class”, “immediate cause of death”, “antecedent causes of death”, “other significant conditions” and “final manner of death”. All cases that did not undergo autopsy were excluded.

The selection of the sample was done by first extracting all the cases for which autopsy had been performed and were classified as “drug related” with the exclusion of “drug related – alcohol”. A list of immediate and antecedent causes of death, as well as other significant conditions was prepared to help identify cases considered DOD by NSMES. For each case, a comparison was made between the investigative findings “death class” and the post autopsy COD “immediate cause of death”. Statistical analysis was done to investigate if there was a variation in initial COD findings and post autopsy COD conclusions. Additionally, a qualitative analysis was done for all cases in which there was variation in putative COD and post-autopsy conclusions. For the qualitative analysis, causes and manners of death were identified for cases that were suspected to be DOD during initial investigation and not confirmed post autopsy. As well, putative COD was identified for cases that were not suspected to be DOD but confirmed post-autopsy to be DOD the putative COD.

A limitation of this study was that only closed cases were analyzed for 2015-2016. Some of the cases that were open could have been drug related. While the rationale for not considering drug related – alcohol cases from the MEA has been discussed, there could be some cases of drug overdose that may have been missing from the data. Absence of both open cases and alcohol related cases would introduce sample bias.

3. Ethics

The reference number of the completed Ethics Review form for the University of Toronto, Mississauga (UTM) is 2017-044 and was filed with the Research and Graduate Office on the UTM campus. Approval for conducting this research electronically was given by the NSMES followed by signing a Confidentiality Agreement. The researcher and the NSMES Research Supervisor signed an agreement, which allowed the researcher to remove notes and documents from NSMES under the conditions stipulated. The study complies with the NSMES ethics approval protocols. The NSMES allowed the researcher ‘read only’ access to MEA through government computers at NSMES premises. The confidentiality of all case files was protected by saving all raw data on a password protected USB at the NSMES. The data was then encrypted into an Excel file using a non-identifying numbering system, preventing identification of individual cases by the researcher. Only summary data could be reported, and computers used for research as well as the specific files for analysis were password protected.

4. Methods

Since the COD decisions before and after autopsy for each case form a matched pair, the McNemar paired test was conducted to test the significance of differences in decisions. The McNemar test is used for categorical variables where each variable has only two possible outcomes (Koletsi and Pandis 2017). Categorical variables represent data like ancestry, hair colour, and gender. In this study, each of the two categorical variables, putative COD and post-autopsy COD, have two outcomes: DOD or not DOD.

The McNemar test is a non-parametric statistical test; a type of a chi-square test that uses paired data (Adedokun and Burgess 2012). The test assesses the extent of change in the dichotomous dependent variable from pre-intervention to post-intervention (Pett 2015). The null-hypothesis is rejected if the proportion of changed outcomes in one direction is sufficiently larger than what can be expected by chance (Pett 2015). It has been used for measuring the impact of interventions like the effectiveness of home monitoring in hip replacement surgery patients and to evaluate the impact of individualized lifestyle intervention on the obesity and metabolic syndrome of children (Pett 2015).

In this study, the objective was to examine the impact of autopsy on improving the accuracy of assessment of cause of death. It was important to understand the extent of difference in suspected cause of death as being drug overdose death before
undergoing autopsy and cause of death being drug overdose death post autopsy.

5. Results

Analysis of all cases in the two-year period shows that 136 cases were putative DOD (Table 1). Of these cases, 125 were confirmed as DOD, 11 confirmed as not DOD. Of the rest 1362 cases that were not initially suspected as DOD, 41 were confirmed as DOD at autopsy. The McNemar test results ($\chi^2 = 16.17$, d.f.=1, $p=0.00006$) show that there is a statistically significant difference between the putative COD and post-autopsy conclusions. Of the 166 confirmed DOD, 41 cases or approximately 25% were not suspected as DOD initially but confirmed at autopsy. The observations also show that 9-10% of the putative DOD had an anatomical cause of death and did not include intoxication.

Table 1. Number of cases that were identified as DOD or not DOD at initial investigation and autopsy

<table>
<thead>
<tr>
<th>Post Autopsy COD</th>
<th>DOD</th>
<th>Not DOD</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Putative COD DOD</td>
<td>125</td>
<td>11</td>
<td>136</td>
</tr>
<tr>
<td>Not DOD</td>
<td>41</td>
<td>1321</td>
<td>1362</td>
</tr>
<tr>
<td>Total number of cases</td>
<td>166</td>
<td>1332</td>
<td>1498</td>
</tr>
</tbody>
</table>

There were 41 cases that were not suspected as DOD during the initial investigation period but were found to be DOD after an autopsy was performed. These cases were classified under various Death Classes, with 42% of these cases under Medical and 37% were initially Undetermined (Table 2, Figure 1).

Table 2. Death Class of cases not initially thought to be DOD but confirmed after autopsy

<table>
<thead>
<tr>
<th>Putative COD: Death Class</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphyxia - Gas/Chemical</td>
<td>1</td>
</tr>
<tr>
<td>Asphyxia- Suffocation</td>
<td>1</td>
</tr>
<tr>
<td>Drug Related - Alcohol</td>
<td>4</td>
</tr>
<tr>
<td>Fall</td>
<td>2</td>
</tr>
<tr>
<td>Medical</td>
<td>17</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td>Undetermined</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
</tr>
</tbody>
</table>

Figure 1. Death Class of cases not initially thought to be DOD but confirmed after autopsy

Of the 11 suspected DOD that were concluded as not DOD after autopsy, the COD was mostly related to natural diseases (Table 3, Figure 2). The manner of death for 73% of these 11 cases was Natural.

The final cause of death for cases that were putative DOD but confirmed as not DOD after autopsy were: acute lobar pneumonia, atherosclerotic coronary artery disease, complications of blunt leg trauma, hepatic failure, hypothermia, hypoxic-Ischemic encephalopathy, Intraparenchymal hemorrhage, ischemic heart disease, myocardial infarction, pneumonia, and sepsis.

Table 3. Final manners of death for putative DOD cases that were confirmed as not DOD after autopsy

<table>
<thead>
<tr>
<th>Manner of death</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>2</td>
</tr>
<tr>
<td>Natural</td>
<td>8</td>
</tr>
<tr>
<td>Suicide</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
</tr>
</tbody>
</table>

Figure 2. Final manners of death for putative DOD cases that were confirmed as not DOD after autopsy

Natural 73%
6. Discussion

The statistical analysis of this study showed that approximately 25% of cases that were not suspected as DOD were confirmed as DOD after the performance of an autopsy. The results have a relevant implication on drug related investigations in Canada due to lack of standardization across jurisdictions (Kelsall and Bowes 2016). Drug related death investigations are complex and there is need for testing after the initial investigations, to improve the accuracy of DOD estimates. The initial investigation, if not supplemented by adequate testing can result in misreporting of DOD. The 41 cases would not have been correctly classified had the forensic pathologist not chosen to perform a complete autopsy and supplement it with ancillary testing. As well, 9-10 % of the putative DOD that did not include intoxication would have overestimated the number of DOD if autopsy had not been performed. Decision on autopsy and ancillary testing may vary across jurisdictions. Considering the variation in testing decisions after initial investigations, DOD statistics at the national level may not be accurate.

Another observation in this study is that the putative COD for a large proportion of deaths confirmed as DOD at autopsy was “undetermined”. Medical examiners are concerned that the classification of drug overdose cases as “undetermined” when an autopsy is not performed, impedes efforts to prevent DOD (Davis 2014).

The need for accurate statistics is critical in designing effective public health policies and making efforts to reduce drug related harm and deaths. Effective public health policies have been shown to make an impact on reducing drug overdose harm. Examples from supervised injection facilities in Vancouver and a pilot study where injection drug users were trained in San Francisco, show that drug overdose fatalities can be reduced (Kerr et al 2006; Seal et al 2014).

In this study, the McNemar test was uniquely used to compare before and after autopsy results and the analysis indicates the possibility of significant errors. This research is limited to the DOD investigations at the NSMES. A larger sample size, especially representation of more densely populated provinces and territories would be required for developing standards across the country. Analysis of a larger sample of cases can also help identify how the initial death investigation process of drug related cases can be improved. By understanding the specific ambiguities faced while determining the putative COD, training of investigators can help improve accuracy during the initial investigation.

Acknowledgements

The authors wish to thank an anonymous reviewer for the valuable comments and suggestions. We also thank Dr. Tracy Rogers, Director of the Forensic Science Program, Dr. Lauren Schroeder, Assistant Professor of Anthropology, Emily Schleihau, and the staff in the Department of Anthropology, at the University of Toronto Mississauga.

References


Interview with Aleesha Singh
Winner of the Dean’s Excellence Award and Anthropology Specialist

By Areesha Imaan Siddiqui

I had the wonderful experience of interviewing Aleesha Singh, a 5th-year Anthropology student. Aleesha won the Dean’s Excellence Award for Research and Experiential Learning in April 2019 and was selected as one of Forbes Under 30 Scholars.

When did you know that you wanted to study Anthropology?
I started off in a Biology major stream but when I reached my third year, I realized that it wasn’t something I wanted to do anymore. I had already taken and loved Anthropology as my minor and decided to make it my major. My gateway course was ANT208 The Culture Machine: The Anthropology of Everyday Life; particularly the discussions on how political messages are embedded into media.

Can you tell me why you won the award, and what it means to you?
I won it due to a group assignment for my experiential learning course. We created a children’s app that is an interactive garden in which kids can interact with different aspects of food, learn what their benefits are, and how to use them in a healthy diet. This app could be used to instill healthy living habits in young children. The award represents leadership and opportunity: a reminder that you should put yourself out there and have the confidence to ask for things.

What interested you about experiential learning?
I have always been a hands-on learner and needed an environment in which I could physically interact with the information and apply my scientific knowledge to real situations. I’ve always known I wanted to create my own technology and this course fueled my interest in the many entrepreneur opportunities available.

What would you tell undergraduate students who are considering experiential learning courses (particularly students in Anthropology)?
You have to go with an open mind and remember that nothing is a stupid idea. You need to be creative but also have the capacity to take constructive criticism. Anthropology really helps with being open and allows for different
perspectives, which is useful in experiential learning.

**Why did you attend the summit?**
I was selected as a Forbes Under 30 Scholar and was invited. I’ve always been interested in entrepreneurial workshops and I knew the summit would be an amazing opportunity that I was grateful for.

**What were the most interesting aspects of attending the Forbes under 30 summit?**
The three most interesting aspects were networking, the technology and entrepreneurial panels, and being able to participate in a Hack-athon. I was able to find out about so many different opportunities. The different panel sessions helped me understand how to be innovative. My group came 4th for our creative solution to the harmful algae blooms in Lake Erie; use AI to trace the levels of algae and use an app to notify companies when to address the problem.

**Why is studying Anthropology important to you?**
It allows you to make the unfamiliar familiar. You learn to be more open-minded and less judgmental. I love the concepts and open-minded perspective that is applicable in everyday aspects; the relatability of the discipline drew me in.

**Do you have specific career goals in mind?**
I’d like to take time off to travel the world. It’s important to see the world to know what you could change and to help people better. Tying into my plans after graduation, I want to work a full-time entry-level job at a tech company like Shopify. One day, I would love to create my own technology company so I can be the representation for future generations, a woman of colour running her own technology company.

**What is your current focus? Is there anything specific you would like to share?**
I want to focus on honing down the craft; I’d like to improve my coding skills to create a versatile tool kit that can be applied better.

**Thank you very much for talking to Young Anthropology! We wish you all the best with your future endeavours.**
Thoughts on Hokkaido
An experiential learning trip in Japan (ANT 414)

By Lydia Clarke Rehman

Visiting Hokkaido, Japan this past October, 2019 marked one of the most humbling educational experiences. I am truly grateful to have participated and travelled with my peers and colleagues. The title of the course (ANT 414) and its integrated experiential learning experience sparked my initial interest in the trip: “Plants, People and Prehistory.” My prior knowledge in archaeobotany was minimal and this opportunity allowed me to learn an understudied, new subfield of anthropology. This trip deepened and broadened my understanding of anthropology.

This trip was largely based on learning about the Ainu. The Ainu are the Indigenous people of Northeastern Japan. We learned about the issues surrounding this diminishing population. We went to many museums, such as Nibutani Ainu Culture Museum and the Saru River Museum. These museums illustrate how the Ainu would have lived their traditional life. It was amazing to see the settlement patterns and cultural traditions, such as ceremonial clothing, dwellings, and cultivated plants of this population. I have gained a broader perspective of the Ainu’s ways of living over the last hundred years, and the cultural traditions that have been carried forward to today. The Ainu are a marginalized group, who have faced years of assimilation, prejudice and discrimination.

The Ainu living in Japan today struggle to receive proper legislative rights from the Japanese government. Learning this was vital because the Ainu of Japan are a largely unknown people. Taking time and learning more about them from Indigenous elders and activists – as our group in Japan did – brings attention to the issues Indigenous peoples face globally. Naturally, we grew an appreciation for the parallels between the Indigenous people of Japan and Canada.

At Hokkaido University, where we were introduced to welcoming, talented students. They were ineliminable from making our experience in Japan enjoyable and enriching. On campus, we were able to visit Sakushu-Kotoni-Gawa River Site, an archaeological site that had been occupied by the predecessors of the Ainu. The plant remains found on this site are currently being analyzed in the lab. Being able to visit the site provides a wonderful context for completing research projects in archaeobotany and anthropology.

Throughout the duration of the trip, I was able to explore life in Japan, visiting different regions such as Otaru, Ebetsu, Nibutani. These collectively showcased a variety of museums to gain a deeper understanding of the history and archaeology in Japan. I was able to immerse myself in Japanese culture and food, alongside a wonderful group of peers, support staff and a phenomenal professor, Dr. Gary Crawford. Notably, Professor Crawford gave us insight into the importance of archaeobotany and why learning more about the relationships between plants and people is both enriching and significant.