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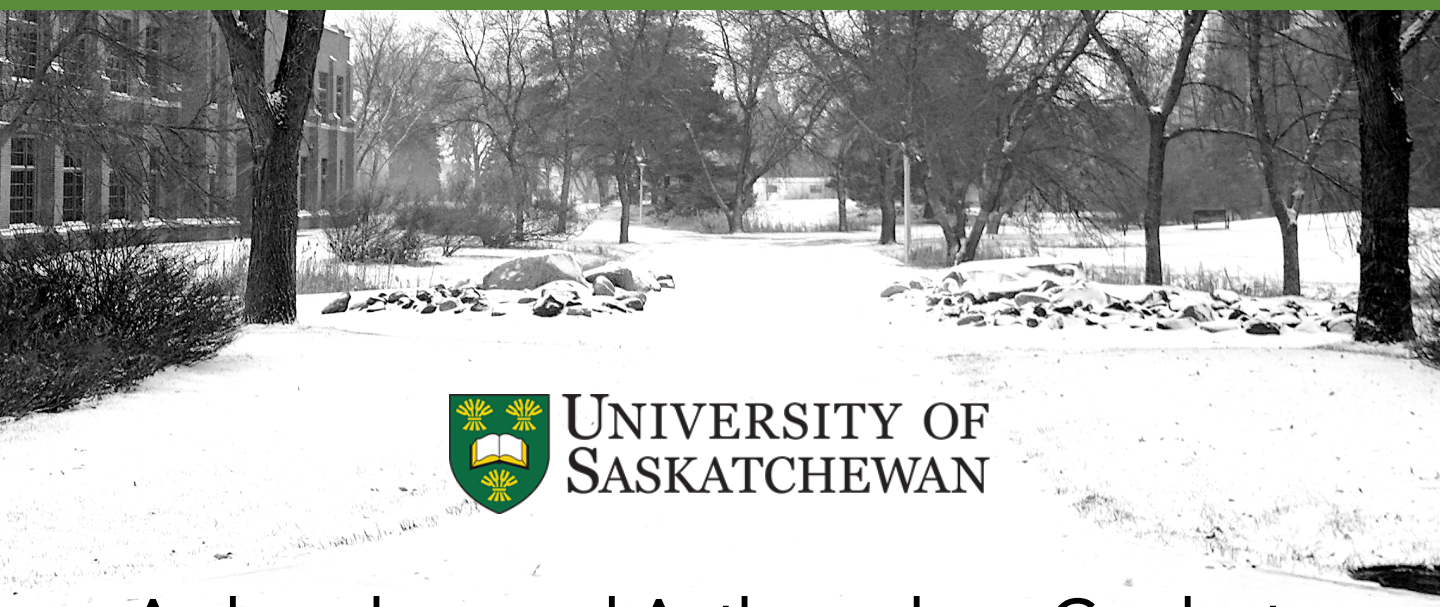
PATHWAYS



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Archaeology and Anthropology Graduate Student Journal

Pathways

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Pathways, University of Saskatchewan Archaeology and Anthropology Graduate Student Journal is run by the UofS Department Archaeology and Archaeology Graduate Students' Association (ARCHAIA) and provides a medium by which to activate the conversations that we graduate students have within our classes to showcase the admirable work that is being done throughout our department. We also aim to provide opportunities for professional development to better prepare our graduates for futures in academia or in the professional realm. We promote original research, review articles, book reviews, high-reaching class papers, commentaries, plain writing summaries of theses, photo essays, and other multimedia submissions from graduate or senior undergraduate students. These works will focus on the four fields of anthropology and contribute to ongoing conversations of scholarship and collaboration. We welcome submissions from students studying at the University of Saskatchewan and beyond.

Produced by the University of Saskatchewan Archaeology and Anthropology Graduate Students' Association (ARCHAIA) and associated with the University of Saskatchewan Department of Archeology and Anthropology.

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Pathways Editorial Board

Letter From the Editors-in-Chief

Dear Readers and Contributors,

We are delighted to introduce the inaugural volume of *Pathways,* presented by ARCHAIA, the University of Saskatchewan Archaeology and Anthropology Graduate Students Association. Born from discussions within our graduate seminar courses, *Pathways* provides a platform upon which to share the works of archaeology and anthropology students from the University of Saskatchewan and beyond. We are truly proud of the hard work that the editorial board and authors put forth reviewing and revising, in spite of the turbulent nature of the COVID-19 pandemic. We feel that now, more than ever, it is important to give students an outlet to present their research and support them through their scholarly experiences. Although the trajectory of many has been altered, our fellow students have shown resilience and determination in the face of adversity.

We hope that *Pathways* becomes a destination for outstanding pieces written by enthusiastic students looking to gain publishing experience and share their hard work with the public. Our inaugural volume contains works from undergraduate and graduate students from the University of Saskatchewan, the University of Toronto, and the University of Alberta. This volume contains topics spanning the disciplines of history, medical anthropology, socio-cultural anthropology, Near Eastern archaeology, and bioarchaeology.

In our journey to create this journal we relied heavily on the direction of many people. Beginning with the ARCHAIA executive committee wholeheartedly embracing this project, the feedback from the faculty of the UofS Department of Archaeology and Anthropology, and the support of our fellow classmates. To Liv Marken and DeDe Dawson, thank you for giving us invaluable advice and contacts to help facilitate the creation of this journal. More thanks go to the University of Alberta Libraries Journal Hosting and Publishing, most notably Sonya Betz and Sarah Severson, for fielding our endless questions and getting us off the ground. Finally, we would like to acknowledge our hard working team of reviewers, our copy editor Francine Wong, and our Faculty Advisors Dr. Tatiana Nomokonova and Dr. Susanna Barnes. The success of this volume, and *Pathways* as a whole, are a direct result of their extremely hard work. When met with the opportunity, they took it and ran, exceeding our wildest expectations.

We look forward to the bright future of *Pathways* and are excited to share our first volume with you!

Sincerely,

Rebecca Bourgeois & Rachel Simpson
Co-Editors-in-Chief

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RESEARCH ARTICLE

Colonial Continuum: (De)construction of a 'Canadian Heritage' at the Fort York National Historic Site

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ABSTRACT
The Fort York National Historic Site was chosen as the site of research to examine how tourist attractions are constructed through the use of certain images and narratives, which reflect existing socio-political power dynamics through the processes of selecting and excluding what is represented. Research into media representations of Fort York was first conducted on the websites of Fort York and the City of Toronto on May 15th and May 16th, 2018. Field observations were subsequently conducted at the Fort York National Historic Site on May 20th, 2018, from 3–5 p.m.; May 30th, 2018, from 2–4 p.m.; and June 2nd, 2018, from 3–5 p.m. The analysis illustrates how the social, cultural, and historical constructions of Fort York render Canada and Canadians as conceptually White spaces and bodies, thus reflecting how the Canadian settler state continues to normalize the erasure of Indigenous peoples, communities, identities, and cultures within the contemporary Canadian landscape. Application of queer Indigenous theories then helps to conceptualize how multiple uninterrupted strands of settler colonialism intersect to form a cohesive but variegated *colonial continuum,* or the tangible inertia of settler colonialism that self-perpetuates colonial heteronormativity. Queer Indigenous theories are thus argued to provide the framework through which colonized peoples can collectively dismantle the colonial continuum.

Keywords: settler colonialism, queer Indigenous theory, anthropology of tourism, symbolic capital, contact zone, power-knowledge, bureaucracy

INTRODUCTION

The Fort York National Historic Site is a local tourist attraction within downtown Toronto. The site was established in 1793 by the British colonial settlers[1] (Benn 2017; Temprano 2018) who built a military garrison on the territories "of the Huron-Wendat and Petun First Nations, the Seneca, and . . . the Mississaugas of the New Credit First Nation"

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[1] The terms *colonial settlers* and *settlers* are used interchangeably in this article to refer to both the past British or American settlers who have colonized North America, as well as all the contemporary non-Indigenous peoples who live and work within the territories and jurisdictions of the modern Canadian state. As individuals partaking in the current economic, social, cultural, and political systems that derive from the continued hegemony of the British-Canadian settler-colonial state, it is quite imperative for the purposes of this article to conceptualize colonialism and colonial identities not as historical, completed, or dead but rather as contemporary, on-going, or living.

(ISSU 2013).[2] Fort York largely fell into disuse after the War of 1812 until it reopened as a historic museum in 1934 when Toronto's residents sought to protect a remnant of the past from the destructive processes of industrialization and urbanization (Benn 2017; Temprano 2018). Today, the Fort York National Historic Site is managed by the City of Toronto with the aim to preserve Toronto's history, a legacy of the War of 1812, and the physical and cultural landscapes that represent the origins of the modern Canadian state.

Fort York was hence chosen as the site of research to examine how tourist attractions are constructed through the use of certain images and narratives, which reflect existing sociopolitical power dynamics through the processes of selecting and excluding what is represented. Research into media representations of Fort York was first conducted on the websites of Fort York and the City of Toronto on May 15th and May 16th, 2018. Field observations were subsequently conducted at the Fort York National Historic Site on May 20th, 2018, from 3–5 p.m.; May 30th, 2018, from 2–4 p.m.; and June 2nd, 2018, from 3–5 p.m. Lastly, due to the practical nature of this project, data collection through informal social interactions have been limited to the employees of Fort York.

In Part 1, the collected data is analyzed through the lens of *symbolic capital* (Bourdieu 1991) and illustrates that Fort York strives to construct a singular Canadian heritage by reproducing a British colonial perception of the land's history, culture, and people. First, Fort York asserts various images of the British military and a whitewashed narrative of the War of 1812 to construct the *tourist gaze* (Urry 1990) and *tourist rhetoric* (Löfgren 2004) that reflect its colonial origins. Next, Fort York emphasizes the historical *authenticity* (Bruner 1994; MacCannell 1999) of such colonial representations through the use of archaeological evidence, original and replicated artifacts, and historical re-enactors. Lastly, Fort York stages its physical site as a birthplace of the contemporary Canadian state by accentuating the sacrifices of the British soldiers during the War of 1812, thus representing Fort York as a *site of pilgrimage* (Graburn 2004) to which all Canadians can visit and pay tribute. Such social, cultural, and historical reconstructions of Fort York legitimize the colonial authority of the Canadian settler state by producing and presenting Canada and Canadians as conceptually White spaces and beings and simultaneously displaces more than ten thousand years of Indigenous histories, influence, and activities within Turtle Island.[3]

In Part 2, Fort York is further conceptualized as a *contact zone* (Pratt 1992) between the colonial institutions in its control and the individual tourists who similarly consume but differently digest the presented materials. Such analysis reveals the process of symbolic negotiations through which tourists can practice agency with their interpretations of the tourist site. However, application of the *power-knowledge* (Foucault 1980) nexus illustrates how the Canadian settler state uses a system of *bureaucratic authority* (Weber 1946) to monopolize the means of knowledge production at Fort York. Consequently, the limitation of Indigenous self-representations at Fort York continues to naturalize the *heteropatriarchy* (Smith 2010) or *heteronormativity* (Driskill et al. 2011) of settler colonialism that privileges White, British, heterosexual, masculine, and cismale representations and identities.

[2] *Indigenous* is used as an umbrella term without regards to the specific First Nations, Métis, or Inuit groups, unless otherwise clarified. It is still important to recognize the multiplicity of Indigenous cultures, nations, and identities that can be both complementary and conflicting with each other at different times.

[3] *Turtle Island* is a term deriving from native Algonquian and Iroquoian languages and refers to the whole continent of North America rather than to any individual modern nation-state that exists today. Turtle Island can be found in various North American Indigenous origin stories and represents the world and/or life in many Indigenous cosmologies. The term holds significance for Indigenous spirituality and symbolic sovereignty.

This is evidenced at Fort York through the dehumanization or *animalization* (Kim 2015) of Indigenous representations within the colonial *racial hierarchy* (Kim 2015) that dignifies White British male subjects as normal, rational, "full" human beings, but devalues Indigenous male subjects as abnormal, irrational, "less than" human beings. Similarly, within the context of global capitalism, the commercialization of appropriated Indigenous artifacts at Fort York exemplifies how reducing the multiplicity and diversity of various Indigenous peoples, nations, cultures, and identities into a single totalizing concept perpetuates symbolic assimilation and genocide. The Fort York National Historic Site thus demonstrates how the Canadian settler state continues to normalize the erasure of Indigenous peoples, communities, identities, and cultures within the contemporary Canadian landscape.

Lastly, Part 3 attempts to illustrate the ways in which multiple uninterrupted and entrenched strands of settler colonialism can be conceptualized to intersect and form a cohesive but variegated *colonial continuum,* or the tangible inertia of settler colonialism that self-perpetuates contemporary colonial heteronormativity. It further demonstrates how the *logic of Indigenous genocide* (Smith 2010) and the logics of settler colonialism entrap all Indigenous peoples, immigrant communities, and Canadian settlers within the colonial continuum. It then introduces queer Indigenous theories to begin to explore how Indigenous *intellectual sovereignty* (Warrior 1994) and the *subjectless critique of Indigenous theory* (Smith 2010) can allow us to engage in our *disidentification* (Muñoz, 1999) with the logics of settler colonialism and to participate in the *radical remembering of the future* (Meyer 2003). Queer Indigenous theories are thus identified to provide the framework through which colonized peoples can collectively dismantle the colonial continuum while reconstructing our *collective decolonial futures* (Driskill et al. 2011).

PART 1: COLONIAL RECONSTRUCTIONS OF THE TOURIST SITE

The data collected at Fort York is first analyzed through the conceptual lens of *symbolic capital* (Bourdieu 1991, 72, 106), which is adapted and defined here as the approximate level of value, prestige, or honour that is conferred by the tourist site upon the materials and subjects of its main concern. The conceptual lens of symbolic capital enables the analysis of how the social, cultural, and historical constructions of the tourist site reflect, whether intentionally or not, the dominant values and beliefs that are held by the social group in control of the site and Canadian society at large. The analysis here illustrates how Fort York attempts to construct a Canadian heritage by reproducing the British colonial perceptions of Canadian land, history, and culture, displacing more than ten thousand years of Indigenous histories and activities within Turtle Island.

The Tourist Gaze and Rhetoric

The work of Urry (1990) illustrates that a tourist site uses certain images and symbols to shape the visitor's perceptions within the intended *tourist gaze* (9). At the Fort York National Historic Site, images of the British military and symbols of Britain and Canada are used to construct a tourist gaze that accentuates the colonial British heritage of both Fort York and Canada. For example, various images of the British soldiers, generals, uniforms, and weapons are prominently featured as drawings and photographs throughout the websites of Fort York and the City of Toronto, specifically on their front pages, galleries, posters, and event advertisements. The same images are also displayed at the physical Fort York grounds and exhibits as photographs, artifacts, souvenirs, and costumes. Images depicting the British military condition the site's visitors to presume a tourist gaze that implicitly limits their comprehension of Fort York within its

connections to the War of 1812, and thus the history of its British colonial settlers. Similarly, the overt use of the British Union Jack and the National Flag of Canada—such as the ones flying side by side on the central flagpoles—compel their viewers to assume the presented links between the identities of Fort York, Britain, and Canada. The site's visitors are therefore encouraged to adopt the induced tourist gaze that not only limits their comprehension of Fort York within the bounds of its colonial history but also leads to the association of contemporary Canadian state and society to their British colonial heritage and identity.

The suggestive effects of the tourist gaze are made explicit by what Löfgren (2004) calls the *tourist rhetoric,* an overarching narrative that directly manipulates the visitor's interpretation of a tourist site (93–94). For instance, an article posted on the Fort York website and a short film presented to the visitors at the beginning of their tour both illustrate the War of 1812 as a story in which the heroic British military and their Mississauga and Ojibwe allies were forced to confront the Americans who had already assaulted the territories of the Ohio First Nations and were now invading Southern Ontario (Benn 2017). At the same time, Fort York omits from their narrative the story of Chief Wabakinine, a Mississauga chief who was murdered by the British military *after* the Mississauga's territories were acquired through a treaty agreement that the British later broke (Fiddes 2014). The presented history of Fort York and the War of 1812 thus creates an underlying narrative that configures the British colonial settlers as the moral protagonist and the American colonial settlers as the antagonist within their military conflict. It also constructs the British as a friend and ally of the Indigenous peoples while the Americans are constructed as their collective enemy. The colonial rhetoric at Fort York thereby positions the British as good and Americans as evil within the imaginaries of the tourists, which directly conditions visitors to identify themselves, Fort York, and Canada within the identities of the moral and rightful British colonial settlers.

Additionally, the omission of rich Indigenous histories within the Great Lakes and the delegation of Indigenous peoples as auxiliary to the British protagonist reconstructs the historical, social, and cultural landscapes of Fort York and Turtle Island as conceptually White and British spaces that were neither significant nor existing prior to the European contact. For example, the Fort York National Historic Site and the City of Toronto occupy Indigenous territories that are "the subject of the Dish With One Spoon Wampum Belt Covenant, an agreement between the Haudenosaunee Confederacy and the Confederacy of the Anishnaabek and Allied Nations to peacefully care for and share the resources around the Great Lakes" (ISSU 2013). However, by only introducing the War of 1812 as the period of significance, and British colonial history as the subject of interest, the tourist gaze and rhetoric at Fort York disregard and negate the significance of Indigenous human activities and histories that have shaped the Great Lakes region for centuries prior to the arrival of European and British colonial settlers.

Touristic Authenticity and the Site of Pilgrimage

The manipulative effects of the tourist gaze and rhetoric are magnified at Fort York through the certification of its historical and cultural legitimacy, or what Bruner (1994) and MacCannell (1999) refer to as *authenticity* (399–400; 14–15). For example, Fort York evidences that the battles of the War of 1812 took place within its physical site by displaying their surviving artifacts—such as the rifles and canons—coupled with archaeological research that together prove such claims. The originality of the artifacts and archaeology's academic authority are thus utilized at Fort York as legitimate certificates

of its historical authenticity (Bruner 1994, 399–400), which subsequently authenticates the site's colonial tourist gaze and rhetoric. Fort York's authenticity thereby strengthens its capacity to obscure the visitor's comprehension of the site and Canada within the presented British-centric narratives. Additionally, by replicating the British soldiers' barracks and employing historical re-enactors to verbally and physically engage with the tourists, Fort York creates the experiential cultural realism that certifies the site's authenticity as a British-owned and -occupied territory, both in its past and present (Bruner 1994, 399–400; MacCannell 1999, 14–15). The visitors at Fort York are thus more likely to trust and assume the presented tourist gaze and rhetoric that configure the identities of Fort York and Canada as spaces that exclusively resonate with its presumed British colonial heritage.

The Fort York National Historic Site subsequently uses the tourist gaze, rhetoric, and authenticity to present and legitimate itself as a Canadian *site of pilgrimage* (Graburn 2004, 27) and in the process exerts a singular, whitewashed British-Canadian identity upon the tourists. For instance, the tourists at Fort York are asked by the end of their visit to commemorate the deaths of heroic British soldiers who defended Canadian territories, identity, and autonomy from the Americans through their sacrifices. Fort York is thus simultaneously illustrated as a birthplace of contemporary Canadian state and society as well as the sacred place at which Canadians can forge interpersonal connections to their assumed colonial-historical origins and British-cultural identities. Hence, as Graburn (2004) suggests, the Canadian tourists at Fort York are physically removed from present reality as they enter the authentic-historic past, experience personal and symbolic transitions through the consumption of Fort York's tourist gaze and rhetoric, and are reincorporated back into society once their conceptualization of their Canadian self is associated with the colonial state's British history, heritage, and identity (26–29). Additionally, because Fort York assumes a singular Canadian identity based on its British-colonial origins, the authentic Canadians are conceptualized as exclusively White and British beings. The social, cultural, and historical constructions of Fort York therefore attempt to legitimize the colonial authority of the Canadian settler state by manipulating the tourists to imagine Canada and Canadians as conceptually White and British spaces and beings. This not only displaces the abundant histories and activities of Indigenous peoples within Turtle Island but also erases the continued impacts and presence of Indigenous peoples and ethnocultural minorities within the Canadian landscape who individually and collectively possess, influence, and shape contemporary Canadian identities, which are in reality flexible, dynamic, and multitudinal.

PART 2: THE CONTACT ZONE AND THE REPRODUCTION OF COLONIAL HETERONORMATIVITY

The conceptual lens of symbolic capital has allowed the analysis of the presented materials at Fort York and how their social, cultural, and historical constructions could manipulate tourists' imaginaries within the ideological values and beliefs of the Canadian settler state. Yet, further analysis of how individual tourists may actually interact with the tourist site and produce their own interpretations requires the use of Pratt's (1992) *contact zone* as another conceptual lens (4, 6). The term contact zone is adapted and defined here as spaces in which the individuals who possess different histories, cultures, identities, and perspectives come to meet, interact, clash, and re-establish their conceptualization of self and others in relation to each other, usually within the context of asymmetrical power dynamics such as settler colonialism. Examination of how different tourists with prior social, cultural, historical, and political values, beliefs, and understandings may come into ideological

contact with the Fort York National Historic Site subsequently reveals the unequal power dynamics between the tourist-consumers, colonial-producers, and the Indigenous communities who are continually being displaced within the ideological Canadian landscape.

Privileged Knowledge Production within the Bureaucracy

While Fort York presents the same materials and experiences to all its visitors, each tourist possesses the ability to practice agency within their own interpretations of the tourist site. For example, a British-Canadian tourist from Ontario is much more likely to accept the presented colonial gaze and rhetoric and is also more likely to reaffirm their conceptions of self, Fort York, and Canada within the offered British colonial heritage and identity. On the other hand, a non-British, non-White, or Quebecois Canadian tourist may feel alienated by the same materials that are presented, and thus be more likely to reconceptualize their own identities, values, and beliefs to fit within the British colonial heritage and identity. In contrast, these tourists may be compelled to reject these suggested notions and ideas altogether. Fort York can thus be viewed as an ideological contact zone in which tourists can participate in symbolic negotiations; however, while the tourists all ingest the same materials and experiences, they each may digest them differently based on their pre-existing values and beliefs that conflict and interact with the site's presented materials (Pratt 1992, 4, 6).

Yet, the application of Weber's (1946) *bureaucratic authority* and Foucault's (1980) *power-knowledge* nexus as conceptual lenses illustrates how the Canadian settler state uses its legal and political systems and authority to monopolize the means of knowledge production at Fort York and thus perpetuate the asymmetric power dynamics that reduce the authority and legitimacy of the tourists' interpretive agency and their produced knowledge (196–198; 51–52). For example, the legal and political authorities of the municipal, provincial, and federal governments of Canada empower the selective few bureaucrats to curate the official histories and narratives of Fort York but strictly within the rules, procedures, and regulations set by the City of Toronto. Meanwhile, the tourists must consume the official versions of Fort York's histories and narratives to recreate their own personal and informal interpretations. The Canadian settler state thereby uses its bureaucratic authority to monopolize and control the production of true knowledge and official histories and thus undermines the tourists' ability to produce knowledge that can be considered valuable and legitimate through their symbolic negotiations within the contact zone.

Colonial Heteronormativity and Its Effects

The settler state's monopoly on official knowledge production simultaneously displaces Indigenous communities' rights to self-identification and sovereignty and hence continues to perpetuate what queer Indigenous scholars Driskill et al. (2011) and Smith (2010) call the *heteronormativity* or *heteropatriarchy* of settler colonialism (19; 610).[4] The heteronormativity of settler colonialism refers to the naturalizing of colonial social hierarchies that privilege heterosexuality, masculinity, the cismale gender, White and European identities, and systems of British-Canadian colonial governance above the sovereignties, identities, values, beliefs, and practices of all colonized peoples, especially those of Indigenous heritage (Driskill et al. 2011, 19; Smith 2010, 61). At Fort York for instance, its images and narratives of war, honour, and violence are dominated by White, cisgender, heterosexual British male subjects—such as male soldiers and generals—while the discussion and representation of British female subjects are

[4] Heteronormativity and heteropatriarchy are used synonymously throughout this essay.

confined to the kitchen where traditional domestic work is conducted. Furthermore, in the rare and brief instances in which non-White peoples–specifically those of Black and Indigenous heritage and identities–are the subject of discussion, their representations are exclusively limited to those of cisgender men of colour.

More troubling still is that the only anthropomorphic representation of all Indigenous peoples at Fort York is the wax figure of a male Anishnaabek "warrior," portrayed as angry, yelling, violent, and intimidating. On the other hand, the wax figure of a male British "soldier," which parallels the Anishnaabek warrior, is portrayed as calm, gentle, peaceful, and approachable. The limited portrayal of Indigenous peoples as a man who is violent, frightening, less significant, and different from the "normal British man" exemplifies the continued dehumanization or *animalization* (Kim 2015, 43) of Indigenous peoples in which Indigenous peoples are seen and regarded as less civilized and less human than their European counterparts. At the same time, it exhibits the privileging of Europeans within the colonial *racial hierarchy* (Kim 2015, 43) where non-British and non-White peoples are, in that order, placed below White British people who inherently possess greater abilities, values, and civility within the colonial imagination. Therefore, the lack of self-representation from visible minorities at Fort York, especially from the members of Indigenous communities that can accurately describe and thus humanize traditionally marginalized and misrepresented peoples, allow the perpetuation and normalization of British heteropatriarchy within the lived histories and current realities of Canadian settler colonialism.

Furthermore, deconstructing the process of souvenir commodification at the Fort York gift shop illustrates how the dehumanizing influence of settler colonialism is amplified within the context of global capitalism. For example, the tourists visiting Fort York are bombarded by the site's Union Jack key chains, British soldier costumes, toy guns and rifles, British-Canadian history books, and Victorian houseware items, as the tourists must transit through the gift shop to access the historic grounds. As Urry (1990) and Löfgren (2004) suggest, these souvenirs repackage Fort York's tourist gaze and rhetoric into small, digestible pieces so that the tourist-consumers can easily and perpetually reconsume and reaffirm the presented colonial histories and ideologies (13; 100–101). And as Schwenkel (2006) and McMaster (2014) demonstrate, such souvenirs are used within the global tourism industry to not only further accumulate economic capital through the material commodification of tourist experiences but also to exacerbate the scale and speed of legitimization and dispersion of Fort York's colonial tourist gaze, rhetoric, and authenticity within the globalized capitalist economy (20–22; 5, 24).

Likewise, a small corner of the gift shop houses the Indigenous themed souvenirs, such as dream catchers, copper jewelries, bead works, toy bows and arrows, fur accessories, and arrowhead replicas that have mostly been mass-produced in China for consumption by the tourists. Consequently, such commodification of Indigenous artifacts and aesthetics reduces Indigeneity—which includes diverse nations, groups, identities, spiritualities, cultures, beliefs, and practices—into a simple and one-dimensional concept that can much more easily be consumed by the tourists (Driskill et al. 2011, 8; Smith 2010, 59). The simplification of Indigeneity at the Fort York gift shop then illustrates how the settler state historically and continually perceives authentic Indigenous peoples as non-existent, vanished, dead, and/or assimilated, and it simultaneously reproduces Indigenous lands as invadable, resources as extractable, identities as absorbable, and cultures as freely useable (Driskill et

al. 2011, 19; Smith 2010, 53, 61–62). Furthermore, the displacement of Indigenous peoples from the production of their own cultural commodities leads to the loss of new opportunities for them to accumulate economic capital as well as the inability to properly represent their own individual nations, cultures, histories, beliefs, and practices to diverse foreigners[5] (Grove 2002, 54; Jalais 2005, 1761–1762; Kirtsoglou and Theodossopoulos 2004, 146, 152; Schwenkel 2006, 20–22). Hence, the settler state's monopoly on the production of knowledge and cultural commodities at Fort York exemplifies the symbolic genocide of Indigenous peoples through the erasure of self-identified Indigenous nations, histories, cultures, and identities within the totalizing Canadian landscape.

PART 3: QUEERING SETTLER COLONIALISM FOR COLLECTIVE DECOLONIZATION

The use of the contact zone as another conceptual lens in the analysis of Fort York has demonstrated how the asymmetrical dynamics of knowledge, power, and control perpetuate the attempts to dehumanize, devalue, exploit, and assimilate Indigenous peoples within the hegemonic and colonial Canadian landscape. While the conflictual and dynamic nature of the contact zone has allowed the broad recognition and examination of Canadian colonial heteronormativity, its further interrogation and scrutiny require the distancing and alienation of the totalizing logics and realities that perpetuate colonial heteronormativity, within which much of North America is entrenched.

For instance, the Fort York National Historic Site reinforces *the logic of Indigenous genocide* (Smith 2010) by presuming the Canadian settler state as the natural and permanent form of national identity, social organization, and political governance (Smith 2010, 50, 53; Driskill et al. 2011, 2–3). The conceptualization of the settler state as natural forces Indigenous peoples—as well as all non-Indigenous peoples—to accept the realities of settler colonialism within the present, to accept the sovereignty of colonial governance in order to legally exist, and thus in the extreme sense, to accept the death of Indigenous identities and sovereignties through any form and degree of assimilation within the Canadian settler state (Smith 2010, 53). The notion that the settler state is natural also compel all Canadian citizens, immigrant communities, temporary residents, and Indigenous peoples to embody the heteronormative norms of settler colonialism within their lived realities in order to properly live and exist within such contemporary Canadian landscape (Smith 2010, 50; Driskill et al. 2011, 2–3).

In order to further recognize, examine, and interrogate the entrenched heteronormativity of settler colonialism, the individual instances of colonial heteronormativity are proposed here to be conceptualized as *a strand* of settler colonialism while the cumulative whole in which multiple strands of settler colonialism intersect is conceptualized as forming a cohesive but variegated *colonial continuum,* or the tangible inertia of settler colonialism that has historically self-perpetuated and continues to self-perpetuate colonial heteronormativity.

To elaborate, settler colonialism is thought to manifest at the levels of individual, group, community, institutions, and nations through each iteration of thoughts, actions, speech, and governance that mimic past instances of colonial heteronormativity (i.e. racist segregation laws, actions, comments, and representations). Each manifestation of colonial heteronormativity possesses the ability to further spread and reinforce the power and logics of colonial heteronormativity through its wider socialization and accumulation of colonial social capital. However, individual instances or strands of

[5] The term *foreigners* is used to indicate any persons who do not belong to the same Indigenous nation or culture group and not to indicate only those who are legally not Canadian or ethnically non-Indigenous.

settler colonialism can also be much more easily identified, scrutinized, and dismantled by different individuals and groups, rather than when settler colonialism is conceptualized as an immense immaterial and impersonal ideology. Thus, the formulation of colonial strands can help to incrementally dissect and dismantle settler colonialism and its ability to self-perpetuate within the existing social, political, legal, and economic systems. In the case of Fort York, conceptualizing each image, story, artifact, souvenir, and re-enactment as individual instances of colonial heteronormativity facilitates the recognition and subsequent removal of the colonial ideals and narratives that they exhibit. By scrutinizing and removing each strand of setter colonialism, we could reduce or even eliminate the colonial social capital that self-reinforces its currency and power within the constructed colonial reality, thus dismantling the colonial continuum that exists at Fort York.

Nevertheless, the conceptualization of colonialism and its ideologies should be careful as not to determine settler colonialism as either a passive *or* an active social force. This is because on the one hand, to conceptualize settler colonialism as only a passive social force can lead to the reducing of contemporary settler colonialism as the unintentional and unfortunate remnants of past imperialism and fails to hold account of individuals and groups who actively attempt to reproduce and reinforce settler colonialism. On the other hand, to conceptualize settler colonialism as only an active social force can lead to the undermining of individual agency, which can lead to resistance to, and conversion from, the logics of settler colonialism. It also would assume settler colonialism as the dominant and punitive social force that cannot be changed or renewed within our lived realities.

With that in mind, it is also imperative to highlight here the works of queer Indigenous scholars who can provide the framework through which all colonized peoples could jointly question, deconstruct, resist, and reform the logics of settler colonialism and achieve our *collective decolonial futures* (Driskill et al. 2011, 18). For instance, Warrior (1994) calls for the restoration of Indigenous *intellectual sovereignty* that would position Indigenous knowledge and peoples as the producers of intellectual theories, concepts, and methodologies (123–124). Indigenous intellectual sovereignty would then allow what Smith (2010) calls the *subjectless critique of indigenous theory,* or the use of the multiplicity and complexity of Indigenous ontologies, epistemologies, and pedagogies to identify, question, and deconstruct the logics of settler colonialism (43–44). Indigenous intellectual sovereignty and the subjectless critique of Indigenous theory subsequently allow us to reimagine our futures that are free from the strands of colonial continuum—a process that Meyer (2003) calls the *radical remembering of the future* (54).

Queer Indigenous theories could therefore empower all colonized peoples to collectively escape the logics of settler colonialism, to recognize the artificiality of our colonial realities and thus begin to diverge from the colonial continuum, or what Muñoz (1999) calls *disidentification* (11–2). As Smith (2010) suggests, queer Indigenous theories provide "a critical framework for not simply representing the interests of indigenous peoples, but deconstructing Western epistemology and global state and economic structures in the interests of building another world that could sustain all peoples" (63). At the same time, queer Indigenous theories highlight the need for us to move beyond transactional identity politics towards compassionate politics in which collective action against hegemonic power is taken not only because it can benefit the individual or their social group but rather society as a whole (Driskill et al. 2011, 2–3; Smith 2010, 50, 62–63). We could collectively dismantle the colonial continuum through constructing "alternative modes of national belonging that

are not definitionally exclusivist" (Smith 2010, 63), and by engaging in multiple confrontations that incrementally remove the various strands of settler colonialism (Driskill et al. 2011, 2–3; Smith 2010, 50, 62–63).

CONCLUSION

Analysis of the Fort York National Historic Site reveals how the tourist site operates within the logics of settler colonialism. It demonstrates how the settler state continues to normalize the dehumanization, devaluation, and assimilation of Indigenous peoples, nations, cultures, and identities by naturalizing the conceptualization of Canada and Canadians as White and British spaces and beings. Furthermore, multiple uninterrupted strands of settler colonialism intersect to form a cohesive but variegated *colonial continuum,* or the tangible inertia of settler colonialism that self-perpetuates the logics of settler colonialism upon Turtle Island. Within the context of the colonial continuum, queer Indigenous theories provide the framework through which all colonized peoples could collectively recognize, deconstruct, challenge, and replace the totalizing logics of settler colonialism.

The presented analysis is, however, limited by the lack of data intensity and variety. For instance, further research should engage with the tourists at Fort York to understand how different individuals–such as British-Canadians, French-Canadians, Indigenous peoples, immigrants, and foreigners–are actually influenced to produce their own interpretations of the site's materials. This work should also investigate the system of bureaucratic governance using methods such as *institional ethnography* to fully comprehend how the state controls the Fort York National Historic Site's materials, representations, and history. Moreover, further research should compare Fort York with diverse tourist sites around Turtle Island to find their commonalities and differences. Future inquiry could also investigate the ways in which online virtual spaces extend the dynamics of settler colonialism, empower Indigenous peoples to produce and distribute genuine self-representations, and allow the development of a new collective consciousness that is informed by the queer Indigenous framework. Lastly, further research should engage with the Indigenous communities, such as the members of the Mississaugas of the New Credit First Nation, to develop the right framework through which to study and critique the mechanisms of settler colonialism on Turtle Island. The research should similarly explore the ways in which other non-European ontologies, epistemologies, and pedagogies could aid in the reconstruction of our collective futures.

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RESEARCH ARTICLE

Healing Waters and Buffalo Bones: Using Women's Histories to Challenge the Patriarchal Narrative of Lac Ste. Anne, Alberta

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ABSTRACT
Most historical narratives have overlooked women's roles in and Indigenous peoples' relationships with the Roman Catholic church, such as that of Lac Ste. Anne, a 19th century Roman Catholic community in Alberta. Lac Ste. Anne was the first permanent Catholic mission west of the Red River settlement and frequently appears in historical documents and missionary histories. Women and Indigenous peoples, however, are scantily mentioned. In contrast to the dominant patriarchal narratives built from decades of male-based stories, I propose that women's accounts from the settlement illuminate life and relationships between its inhabitants. Drawing on historical sources left by three Sisters of Charity (Grey Nuns), who maintained the chapel and founded the school and hospital in 1859, and oral histories from Victoria Callihoo, a Métis woman who lived in the settlement as a young girl, I will argue that the Catholic Fathers conflated women's lives at Lac Ste. Anne into one over-simplistic patriarchal narrative. Additionally, when re-examined with a 21st century lens, these stories can inform the anthropological study of women at Lac Ste. Anne including their roles and responsibilities, living conditions, physical and social mobility, and relationships with colonialism.

Keywords: history, women and gender, Alberta, religious, Indigenous, anthropology

> Early colonization occurred in areas of significance to Native people, in places like Manito Sakahigan. The early missionaries realized that these places would be good bases to work from . . . Manito Sakahigan was God's lake, a healing lake. (Simon 1995, 3)

INTRODUCTION

In the past, women's roles in and Indigenous peoples' relationships with the Roman Catholic church have only been superficially discussed. The contributions of women have been generally overlooked by early missionary histories from the Canadian Prairies and thus represent a significant paucity in research. Since the founding of its Roman Catholic mission in 1843, Lac Ste. Anne, or *Manito Sakahigan,* has been an important place of religious worship and evangelism for Indigenous communities in Alberta and, as such, brought (and continues to bring) diverse

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groups of people to the area (Simon 1995). The site is about 100 km northeast of the modern city of Edmonton, Alberta (Figure 1) and played a prominent role in the early settlement of the province (Palmer and Palmer 1990, 26–27). In 1889, Fr. Joseph Lestanc founded the annual pilgrimage at Lac Ste. Anne, which has grown into the largest Catholic gathering in Western Canada (Simon 1995). Although a great deal of attention has been paid to the religious history entangled with the site, little focus has been paid to the Lac Ste. Anne settlement, which was a nineteenth century Roman Catholic community founded around the mission that largely consisted of Métis and Stoney Nakota inhabitants. Stories from several women at the Lac Ste. Anne settlement help illuminate the patriarchal narratives that have shaped the history of the area and reveal aspects of life in the settlement.

This research began as part of a larger archaeology project investigating Métis places in Alberta and Saskatchewan; however, the illuminating stories found at Lac Ste. Anne warranted their own historical research paper. In regard to methods, I scoured the Provincial Archives of Alberta (Edmonton, AB), Musée Héritage Museum (St. Albert, AB), Sisters of Charity Archives (Montreal, QC), and the Library and Archives Canada (Ottawa, ON) for materials relating to the women of the Lac Ste. Anne settlement.

From this literature review, two distinct sources from different temporal periods of the Lac Ste. Anne settlement were examined for this essay. First, in 1859, three Sisters of Charity (Grey Nuns) were sent from Montreal

FIGURE 1—*Map depicting the location of the Lac Ste. Anne settlement (indicated by a star) within the Canadian Province of Alberta. Created by William Wadsworth in ArcGIS Pro using available data from Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NRCan, and Parks Canada.*

to Lac Ste. Anne to assist with the running of the mission. Sisters Zoé Leblanc Emery, Adéle Lamy and Marie Jacques Alphonse arrived in Lac Ste. Anne not knowing how to speak Cree or Michif and helped run the mission (Emery to Deschamps 1859). They sent progress reports in letters of correspondence to their Mother Superior in Montreal, informing researchers of their daily lives. These documents are still available as several Lac Ste. Anne-related fonds in the Sisters of Charity in Montreal Archives (Alphonse, n.d.; Emery to Deschamps 1859); however, this paper uses partial English translations published in E. O. Drouin's (1973) *Lac Ste-Anne Sakahigan*. Nevertheless, although the diary was of a personal nature, one should be cautious about making strong assumptions about the Sisters' opinions of life in the settlement from the letters since they were reporting to their Mother Superior. Second, as an elderly Métis woman, Victoria Callihoo's (1960) recollections about her early life were recorded and published by the *Alberta Historical Review* in the 1950s. Born in 1862 to Alexis and Nancy Belcourt in Lac Ste. Anne, she later married Louis Callihoo in 1879 when she was seventeen (Anderson 1985). The young couple first lived in Lac Ste. Anne before moving to the Michel Reserve where they raised twelve children and owned a sawmill. Tragically, one of their sons, John, was killed in a sawmill accident, and the family moved back to Lac Ste. Anne (Anderson 1985). Callihoo later died in St. Albert at the age of 104 years old. Two considerations should be kept in mind when analyzing her stories. Somewhat obvious is the role that additional authors likely played in editing her story for publication and changing her voice. Furthermore, some authors have commented on memory's erasure with age, and Victoria was in her nineties when her recollections were recorded (Van Dyke 2008). Nevertheless, these documents can shed light on the dominant patriarchal narratives of Lac Ste. Anne.

Before embarking on this journey, it is important to discuss my relationality to this topic. I (Wadsworth) am a man and am not attempting to "give" these women their voice back. By writing this historical essay, I am merely trying to draw attention to inaccuracies that have pervaded the literature and further highlight how important these narratives could be to modern projects. In most instances, I quote the women as best that I can so that their own voices come through this paper. Furthermore, I am not going to be using feminist theory to examine and interpret these historical papers, although I suspect this would be highly productive, but I will be approaching these documents with the sensitivity and respect afforded from a twenty-first century lens. Prior to discussing how these women's narratives change our conceptions of the history at Lac Ste. Anne, it is imperative to review the historiographical context of these writings and the current narrative at the site.

HISTORIOGRAPHICAL CONTEXT

The challenge of this paper is that it draws from three distinct historiographies. Firstly, many historians have published widely on women's histories from the northern Great Plains (Laegreid and Mathews 2011). Secondly, although limited or overly hagiographical, Catholic Sisters in western North America have also received growing interest (Butler 2012). Finally, following the *Daniels v. Canada* decision, the field of Métis studies has grown exponentially and more in-depth debates concerning the roles of women have been investigated (Brown 1983; Macdougall 2016). To present an in-depth account of each of these historiographies would be extremely difficult and exceed the confines of this paper. Instead of attempting this difficult endeavour, this study draws on the work of historians Elizabeth Jameson and Jean Barman as they challenged the efficacy of overarching women's histories and argued for a shift in focus toward "little" histories or individual biographies

(Barman 2008; Jameson 2008). These more nuanced histories can then be used to reconstruct and inform grander perspectives on history (Barman 2008; Jacobs 2017; Jameson 2008). This approach has been particularly effective in coaxing out Indigenous and non-Indigenous women's histories that were often overlooked or ignored by paternalistic historians writing regional or national narratives (Albers 2011; Barman 2008; Jacobs 2017; Jameson 2008). The following Lac Ste. Anne case studies hope to grow the productive corpus of little histories from Alberta and help to change problematic narratives. A central debate in Great Plains women's history has also been whether the "West" was good for women (McPherson 2000). This question has influenced the framing of this paper as the Reverend Fathers described women's roles as marginal due to the fact they were not suited to "isolated" prairie life (Drouin 1973). Other studies have challenged this assertion, but these have predominantly focused on white women as agricultural homesteaders (i.e., Jacobs 2017).

During the eighteenth and nineteenth centuries, Catholic Sisters were sent ahead of European settlers to evangelize Indigenous groups in western North America (Butler 2012). The Sisters' endeavours in establishing convents, churches, schools, and hospitals were usually recorded by the missionary Fathers (Drouin 1973; Duchaussois 1919). Although informative, these accounts are steeped with "fatherly concern," specifically in regard to the nuns' accomplishments and hardships they faced in the West (Butler 2012, 4–5). Although far fewer studies about Catholic Sisters have been undertaken in comparison to Women's histories in general, these too are increasing in number. Convent histories exist but are limited in their utility because they have been written by nuns and were typically framed in hagiographical rhetoric as they had to first be approved by the Church (Butler 2012, 5). This essay draws inspiration from Anne Butler's (2012) work on Catholic Sisters in the American West, where she argued that these women found purpose in doing God's work, which challenged institutional narratives written by priests. Meanwhile, fewer scholarly works have focused on the Grey Nuns in Canada with the most influential work being Lesley Erickson's *At the Cultural Religious Crossroads*, which is an account of Sara Riel's life (Erickson 2011). Similar to the American Catholic Sisters, Sara Riel and the Grey Nuns challenge our understanding of western development and oversimplified models of colonialism by demonstrating the ability for Indigenous women to overcome racial boundaries and become nuns (Erickson 1997). In doing so, these religious women both served and transformed Indigenous landscapes and Indigenous-Settler relationships in Western Canada (Erickson 1997).

Similarly, Métis women's roles in shaping Indigenous histories of Western Canada are being increasingly realized (Kermoal 2016). These studies have contributed to the growing trend toward the incorporation of decolonization theory within women's history, which has attempted to disrupt power narratives, change research questions, and build a more inclusive Indigenous history. Brown (1983) argued that Métis women played a central role in fur trade society when marriages built kinship networks between European traders and Indigenous communities. She further argued that future studies into intergenerational gender and familial relationships would shed light on Métis social history (Brown 1983). Additionally, Payment (1996) and Kermoal (2016) have contributed to the understanding of Métis women's sense of place by arguing for their essential (yet difficult) roles within communities. Following the little histories theme, this essay has drawn inspiration from other biographic depictions of Métis women, such as Sara Riel, Marie Rose Delorme Smith, and Isabella Clark Hardisty Lougheed, who navigated the gender, race, class and religious

boundaries that existed in Western Canada (Erickson 1997; MacKinnon 2018). These women have helped challenge the patriarchal narratives that shape Great Plains histories and have informed this essay's methodology.

DOMINANT HISTORICAL NARRATIVES

One of the oldest history books about the area, *West of the Fifth: A History of the Lac Ste. Anne Municipality*, begins with Lac Ste. Anne's "prehistoric history," which is comprised of a detailed description about the geological and paleontological information of the area (ACLSAHS 1959). As a side note, it is stated in *West of the Fifth* that Indigenous peoples (including Cree and Métis) also inhabited the area. They are, however, only infrequently mentioned throughout the rest of the book. The history of Lac Ste. Anne "began" in 1801 when David Thompson marked Lake Manitou on his map. *West of the Fifth* then asserted that the Métis and Indigenous communities moved into this "empty" area with the Hudson's Bay Company (HBC) and missionaries in the early 1840s. It is asserted in *West of the Fifth* that, "Neither of these [early explorers] made any mention of settlement of Métis or of a single Métis family on any of the lakes in the vicinity of the [Lac Ste. Anne], which had there been any, they most certainly would have mentioned" (ACLSAHS 1959, 12).

Fr. Jean-Baptiste Thibault, an Oblates of Mary Immaculate priest, arrived at Manito Sakahigan on August 7th, 1843 (Drouin 1973). Captivated by the beauty of the lake and the number of its inhabitants, Fr. Thibault committed to establishing a mission along its shores which he named after the "grandmother saint" to parallel the Indigenous grandmother figure. Another Oblate priest soon joined him, Fr. Joseph Bourassa, and hey made a deal that Thibault would travel around the countryside and evangelize the Indigenous groups while Bourassa remained at Lac Ste. Anne to look after the Métis settlement (Drouin 1973). While Fr. Thibault evangelized the nearby groups, Fr. Bourassa organized the construction of a new church to be completed in 1852 (Drouin 1973). The Lac Ste. Anne church was the first to exist west of the Red River settlement, and it was significant as it created more ministerial jobs. Also in 1852, Fr. Albert Lacombe, a historical figure for evangelizing many First Nations in the Northwest Territories, arrived in Lac Ste. Anne to join forces with Fr. Bourassa (Hughes 1911). After arriving, Fr. Lacombe attempted to convert the Métis settlement into a farming community. It is explained that these efforts failed because of poor soil conditions, bad weather, and the unwillingness of the Métis to adapt (Drouin 1973).

In 1859, the Oblate priests convinced the Mother Superior of the Sisters of Charity (Grey Nuns) in Montreal to send three nuns to Lac Ste. Anne to assist the priests in running the mission (Drouin 1973). While there is little reference to the arrival of these women in *West of the Fifth*, the chief concern of the Reverend Fathers appears to be the well-being of these isolated nuns (Murphy et al. 2007, 101). Between 1862 and 1863, the Oblate Fathers and Grey Nuns moved the mission to St. Albert, taking a great portion of the settlement with them. Various reasons were given in *West of the Fifth* for the move to St. Albert, most of which relate to resource instability due to disappearing buffalo and lack of farming due to the Métis moving around the landscape, and these were ultimately interpreted by the priests as desertion (ACLSAHS 1959). At this point, there is a discontinuity in Lac Ste. Anne history, and there are few documents between 1863 and 1889, from when Fr. Joseph Lestanc returned to the lake to initiate the annual pilgrimage (Figure 2; Simon 1995). Today, pilgrims still flock to the shores of Lac Ste. Anne during July for healing, renewal, and reconnection. A literature review has shown that this patriarchal narrative can be

FIGURE 2— Photograph of Lac Ste. Anne taken during the Lac Ste. Anne Pilgrimage in 2019 (Photo Credit: Rebecca Bourgeois)

considered as the generally accepted history of Lac Ste. Anne.[1] However, historian Raymond Huel has demonstrated that the priests at Lac Ste. Anne had (in general) a hard time evangelizing the Indigenous inhabitants (Huel 1996). Although women and Indigenous actors make brief appearances in stories about the site, their contributions are short-lived, infrequent, and not fully considered. Using perspectives obtained through the Grey Nuns' documents and Victoria Callihoo's account, the following paragraphs present a more nuanced account of their lives at Lac Ste. Anne, specifically their responsibilities, well-being, mobility, and influence in and by colonialism, to challenge the aforementioned patriarchal history.

[1] In 1973, E.O. Drouin's (Oblate) work, *Lac Ste. Anne Sakahigan* was the first "comprehensive" history of Lac Ste. Anne to be published. As such, it has been reproduced (sometimes verbatim) in other histories of the site such as Davison's (1982) *Lac Ste. Anne Spirit and Trails* and Anderson's (1985) *The First Metis… A New Nation.* Although *Lac Ste. Anne Sakahigan* is descriptive, Drouin primarily drew on the work of early Oblate writers (such as Father Lacombe and Bishop Vital) who wrote down the chronicles of these communities. Currently, there are no histories that properly engage with the documents left behind by the Grey Nuns or the Métis history of the site (although Anderson attempted this). All current websites and popular literature seem to support the current narrative of the site as well.

FOUR WOMEN AT LAC STE. ANNE

Roles and Responsibilities

When the Sisters came to Lac Ste. Anne, they had a very clear understanding of their roles. In letters written to Mother Deschamps, who was Mother Superior of the Grey Nuns in 1859, Sister Emery knew that they had come to the place that they would one day be buried (Figure 3; quoted in Drouin 1973). In the meantime, without fear, the women set upon their duties to God and became key figures in the settlement. Although Grey Nuns often received training in education and health care at the mother house, the limited biographical information about Sisters Emery, Lamy, and Alphonse makes it impossible to say whether they had prior experience with the roles they fulfilled at the settlement (Erickson 1997, 48). It was also revealed in Sister Emery's letters that as the eldest nun (31 years old), she assumed the position of Superior and established the first hospital in Alberta, which operated from their log cabin (Figure 3; quoted in Drouin 1973, 27–32). Sister Alphonse (22 years old) started the first school at Lac Ste. Anne and taught the settlement's inhabitants how to read, write, and recite prayers. Finally, Sister Lamy (23 years old) took care of the chapel and the priests' vestments. Each of the Sisters shared household duties, tended the mission's livestock, and were taught Cree for one hour a day by Fr. Lacombe (to better communicate with the Indigenous people). Emery wrote to Deschamps in 1859 that the Sisters travelled around the Lac Ste. Anne area acting as the local physicians to provide medical care for the Indigenous communities (quoted in Drouin 1973).

FIGURE 3— *A portrait of Sister Emery (Zoe Leblanc) Foundress and Superior at Lac Ste. Anne (1859–1863), Grey Nuns Archives.*

It is impossible to separate these women's roles and responsibilities from the institution that they represented. As Erickson summarized from the existing literature, the Reverend Fathers associated the Grey Nuns' roles in education and health care with "women's duties" and, as such, paternalistically looked down on them (Danylewycz 1999; Erickson 1997, 28–34). That being said, these roles allowed the nuns to function somewhat independently of the male religious hierarchy and cross boundaries within settlements (Erickson 1997, 28–34). There are currently no documents from the Lac Ste. Anne Métis concerning how they perceived the Grey Nuns' roles in the community. Although Erickson found that the Métis resented Sara Riel's attempts to teach them English, it is difficult to extend this to Lac Ste. Anne given that the French-speaking Grey Nuns appear to have been well-received and accepted by the French Métis community as indicated by Sister Emery's letters (quoted in Drouin 1973, 29–32; Erickson 1997, 129). As will be discussed later, since the day they arrived, the Métis community had welcomed and supported the nuns. On October 10th, 1859, Sr. Alphonse recorded that she had forty-two students of various ages in her

classroom, who she taught for one hour per day (quoted in Drouin 1973, 30). The Sisters also took it upon themselves to help children they deemed in need (it is unknown how the Métis reacted to this). As Sister Emery noted:

> A few days after our arrival we visited every single family. All appeared so pleased to see us. We have now taken in two girls, one ten and the other twelve. If the mission were rich enough, we could take in many more as it would be the best way to educate them. (quoted in Drouin 1973, 32)

Independent of the priests, it is impossible to deny that the Grey Nuns played an important role in the community of Lac Ste. Anne. That being said, it is difficult to say how these roles would have overlapped with those of the Métis women.

Like in many Indigenous societies, Métis women played foundational roles within their communities. These women likely obtained this central organizational role during the fur trade, when marriage alliances were made between Indigenous communities and European traders (Van Kirk 1999). Brown (1983) suggested that this practice created the matri-organization that has been found in other Métis community studies (for example, Batoche; Payment 1996; Supernant 2018). These women are scantily mentioned by current ethnocentric narratives that have conflated Indigenous men and women into one group that needed to be saved (ACLSAHS 1959; Drouin 1973). Although Victoria Callihoo did not explicitly comment on women's roles at Lac Ste. Anne, she did explain their essential roles in operating the buffalo hunt.

For much of the year, the Métis families survived on buffalo meat and sold buffalo robes obtained through the annual hunt (Callihoo 1953). This practice developed after the merger between the HBC and North West Company in 1821, which resulted in the unemployment of many Métis traders (Supernant 2018). These people were forced to redefine themselves, and they began to hunt buffalo in kin groups and adopt a highly mobile lifestyle (Macdougall and St-Onge 2013). There has been much written on the Métis hunt, but few articles have focused on the role of Métis women (Macdougall and St-Onge 2013). Starting when she was thirteen, Victoria Callihoo remembered the four buffalo hunts she participated in as a young girl (Callihoo 1960, 24–25). The Lac Ste. Anne Métis were typically the families who began the hunt, being that they were the furthest away from the buffalo herds. The hunt was a gendered activity, and although it was organized and carried out by Métis men, women had a vital role in the operation of the hunt. Callihoo accompanied her mother, a well-known medicine woman, and helped set broken bones and apply medicines to wounded hunters (Callihoo 1960, 24–25). After the kill, the Métis women would process the meat and prepare it for storage and cooking. The buffalo hunts can also be thought of as a social affair and opportunity for reconnection among family members. Although it was a time of hard work, it was also a time of happiness and celebration (Callihoo 1960). The Lac Ste. Anne Métis women's roles as doctors, organizers, and maintainers of their social organization during the hunt is similar to other studies of Métis communities (Kermoal 2016; Macdougall and St-Onge 2013). Therefore, it is plausible that these women had similar responsibilities at home, which works to dispel the ethnocentric and over-simplistic narrative of the Oblate Fathers.

Health, Diet and Living Conditions

In contrast to the assumed struggles these women faced at Lac Ste. Anne, the Grey Nuns seem to have enjoyed a fairly comfortable life compared to the rest of the settlement. In preparation for their arrival, a log cabin was commissioned by Fr. Lacombe for the nuns

(Drouin 1973, 31). In a 1859 letter to Mother Superior Deschamps, Emery explained that their house had five rooms and was substantially larger than any of the Métis living spaces (quoted in Drouin 1973, 31). The largest bedroom was about two by three meters and housed two Sisters. Emery also stated that the other rooms in the house were used as a classroom, prayer room, community room and chapel (quoted in Drouin 1973, 31). They also had a detached kitchen a few meters from the house, however, Emery divulged that they had to evict the Métis family who had been living there to use it (quoted in Drouin 1973, 31). Furthermore, the nuns' eating and sleeping arrangements vastly differed from the Indigenous inhabitants who were doing these activities on dirt floors. In the following quote, Sister Emery described in the 1859 letter that the Sisters were well fed and slept on feather beds with all the accoutrements:

> This year the barley and potato crops have been good. As to wheat . . . let's forget about it; we have already lost our taste for bread. The garden has furnished its share of cabbages, onions, turnips, carrots, etc. We eat fresh meat, pemmican, fish and rabbit in winter. Fish constitutes more than half our total fare. **Many families have but fish boiled without salt and without sauce of any kind.** We have as many potatoes as we desire, sometimes too some barley bannock . . . **we never suffer from indigestion! Sisters Lamy and Alphonse have never been as plump, I am the only one to remain slim**.
>
> I must also, my good mother, tell you a word of our beds . . . Despite our repeated refusals, we have been forced to accept the beds of the Good Fathers. They have but animal skins to sleep on. **We have a feather bed, a pillow and a blanket each**. (quoted in Drouin 1973, 31; emphasis added*)*

In many ways, it is clear that when Sister Emery penned this letter, the three Sisters were in a good state of well-being. Fr. Lacombe credited the mission's move to St. Albert to the Métis' inability to farm, which had created inhospitable conditions (Drouin 1973, 37). Interestingly, as described by Emery, the Grey Nuns appear to be supported by the Métis of Lac Ste. Anne, whose diet consisted of dried meat, pemmican, bannock, and a few garden vegetables and tubers (Callihoo 1953; quoted in Drouin 1973, 31–32; Huel 1996, 65). The clergy even owned a number of animals, including fifteen horses, seventeen cattle, ten dogs, and ten cats. Unlike male authors who described the Sisters' diet as meagre, documents from the Sisters suggested they were healthy and that they worried for the struggling Métis (Drouin 1973; Duchaussois 1919; quoted in Drouin 1973, 31).

According to the clerical community, the Métis of Lac Ste. Anne might as well have lived in impoverished conditions (Callihoo 1953). Simply, the luxuries that the clergy was afforded were not necessary for the Métis to live. They either pitched tipis or lived in one-room log cabins that averaged around eight by five meters in their entirety (Burley and Horsfall 1989; Callihoo 1953). Since the Métis were Roman Catholics, they tended to have large families, which resulted in cramped living spaces. Each home usually had two windows that were covered with stretched animal skin. Floors consisted of compacted dirt or hewed logs placed tightly together. Dried bark was used to shingle the roofs of these cabins. The Métis used open fireplaces in the corners of the cabin to cook food and heat their homes (Callihoo 1953, 22). Around these stoves, the floor was often plastered to keep the cabin from catching on fire. It is well documented historically and archaeologically that

the Métis relied on the HBC store for much of their goods (Supernant 2018). Callihoo (1953, 22) recalled that all the tools and supplies they needed for day-to-day life were obtained at their local trading post. Callihoo's family slept on the floor and each morning their bedding was gathered, folded, and placed in one corner of the house. Their bedding consisted of duck and goose feather mattresses, pillows, buffalo robes, and HBC four-point blankets. Despite these closed quarters, the Métis were still known to hold many parties (Callihoo 1953, 23, 25–26; Supernant 2018; Weinbender 2003). Throughout the year, people commonly held dances in their homes, which drew family and friends from surrounding communities.

Although there were likely times of shortage, Callihoo's account calls into question the starvation narrative promoted by the clerical community when she did not recall her family ever being short on food (Callihoo 1953, 22–25). After the buffalo disappeared, the Lac Ste Anne Métis more heavily relied on the fish from the lake, which was a phenomenon seen in other Métis communities (Supernant 2018). Furthermore, by the 1860s and 1870s, many Métis families had begun to farm (just like Victoria's family had), raise livestock, and supplement their diet with hunted moose, deer, and bear (Anderson 1985; Callihoo 1953). The only grievance Callihoo mentioned was that, at first, the Métis did not care for beef. They learned to like it once they realized they only needed to butcher one or two cows to sustain a family through the winter. Like the Grey Nuns, Victoria Callihoo's recollections of Métis life and living conditions adds compounding evidence against the existing patriarchal history of Lac Ste. Anne.

Women's Physical and Social Mobility

There is no clear "rule" of how women's physical and social mobility was changed by colonialism and the West (McPherson 2000). The women at Lac Ste. Anne seem to fall into the category of increased physical freedom compared to their counterparts in "civilization." The Grey Nuns from Lac Ste. Anne possessed some autonomy in order to accomplish their religious duties. Emery indicated in her 1859 letters to Mother Superior Deschamps that it only took the Sisters a few days upon their arrival to visit every family in Lac Ste. Anne, and they travelled frequently through the countryside to care for Indigenous families (quoted in Drouin 1973).

As previously mentioned, Erickson (1997) found that in some communities, nuns found incredible social mobility independent of the Catholic priests (24–28). In general, the Sisters seem to have been well-received by the Lac Ste. Anne inhabitants. Emery reported that at least thirty people came out to welcome them when they first arrived (quoted in Drouin 1973, 29). Since the founding of the first mission in 1843, the settlement had grown, and Sister Emery realized that the locals were too numerous for the small church as they would often be lined up outside to attend holy communion (quoted in Drouin 1973, 30). If the Sisters had not been as holistically accepted by the devout Métis community, their experiences likely would not have been as positive. Despite these unequivocally good experiences, there were still difficulties in navigating the social world of Lac Ste. Anne. In her daily journal, Sister Alphonse recognized the difficulty in communicating with the "medley of nations" at Lac Ste. Anne (quoted in Drouin 1973, 30). To accommodate for this, the Sisters had been learning Cree from Fr. Lacombe. As their roles differed from the priests (whose goal was evangelism), it is likely that the nuns were viewed differently and had a different understanding of life in Lac Ste. Anne.

Many studies have emphasized the incredible physical and social mobility of the Métis during the late- to post-fur trade time periods, and the Lac Ste Anne Métis were no exception (MacKinnon 2018; Van Kirk 1999). Often settlers and missionaries had a hard time finding the Métis due to their tendency to move.

Fr. Thibault chased Piché (the man who requested a permanent Catholic mission) around Alberta before finally finding him near Rocky Mountain House (Drouin 1973). Similarly, the Métis are famous for travelling vast distances to hunt buffalo (Macdougall and St-Onge 2013). Furthermore, during the buffalo hunts, one Métis man would be elected to go to the Red River settlement to obtain supplies that were not readily available (e.g. plows and garden tools) and usually came back with more families who aimed to settle at Lac Ste. Anne (Callihoo 1953). If that was not enough cart travel for one season, after the hunt was over, some people would then travel to Morley, Alberta to trade horses with the Blackfoot (Callihoo 1953, 25). The Lac Ste. Anne settlement's proximity to St. Albert and Edmonton permitted families to visit each other frequently and attend social events held in nearby communities. Some Métis families kept ponies or dog trains for fast travel to events such as weddings or dances or for urgent matters like fetching the priest in case of sickness (Callihoo 1953, 21–26). Simply, Métis men and women were not averse to long-distance travelling in order to get the items they needed or desired. Callihoo (1953) commented on the travel back from buffalo hunting in southern Saskatchewan,

> The homeward journey was slow, but who cared? The nice sunny days in the fall, Indian summer, made travelling rather fascinating. Occasionally we would run into bad weather, but we were accustomed to it and did not mind as long as we had plenty of the best and most nourishing food I ever ate. (25)

Given this wide range of interaction between settler and Indigenous communities, it is pertinent to also consider Métis women's social mobility. Despite often being pillars of their communities (Brown 1983; Van Kirk 1999), it is important to emphasize that Métis women did what they had to in order to survive. MacKinnon described two accounts of Métis women who hid their heritage to progress in society, and this was not uncommon (MacKinnon 2018, xii–xxviii). In Lac Ste. Anne, following her son John's and husband's deaths, Callihoo owned and operated a hotel and bar for several years to provide for her family (Anderson 1985). Like the Grey Nuns, the Lac Ste. Anne Métis are painted as rooted in place by the dominant narratives, but in reality, these women exercised their freedom and physical and social mobility.

Women and Colonialism

Although the Grey Nuns occupied a different role than the Oblate Fathers, Erickson (1997, 108) argued that they still shared the belief that Christianity and a sedentary lifestyle would benefit Indigenous people. In the translated documents left by the Sisters, there is little to suggest that they were active agents in colonialism. Nevertheless, the Grey Nuns likely subconsciously propagated an independent form of colonialism that was different from the Oblate Fathers (Erikson 1997). They evangelized with the hopes of creating a new Catholic West (Butler 2012; Huel 1996, 65). Furthermore, Sr. Alphonse documented in her journal that she taught French to the Indigenous people at Lac Ste. Anne but does not mention how it was received (quoted in Drouin 1973, 30). In a way, the nuns' silence on the matter may speak volumes about their relationship with the community as proponents of colonialism.

While notable that the Métis could function at higher classes of both Euro-Canadian and Indigenous society (MacKinnon 2018), Callihoo (1953) subtly re-emphasized a particular distinction:

> Métis from Lac Ste. Anne and St. Albert often visited each other, that is once or twice a year. **These two settlements were of the same**

> **people, and they were related mostly**. There would be a man or a family from Lac La Biche or Slave Lake who would come and live in the settlement. **The two Settlements were all Catholics, L'Hirondelle, Belcourt, Gladu, Plante, Laderoute and Gautheir, were of French descent.** (23; emphasis added)

> We used to see Battle River people, off and on. Since they were Métis of French extraction like us, good fellowship prevailed, and some marriages took place. **We did not come in contact with the Métis at Victoria, their being of Anglo-Saxon descent and of a different denomination, no visits, to my knowledge, were ever made to them**. (26; emphasis added)

She noted that ethnic and religious categories created social boundaries that were not crossed in Métis society. Simply, French Catholic Métis men and women only had relationships with similar families. These linguistic and religious boundaries were also noted in the journals of the bishops who were concerned with the growth of Protestantism in the region, promoted by English speakers and the HBC (Grandin 1989). With this in mind, the Catholic pilgrimage to Lac Ste. Anne would have been an opportunity to meet other French Catholic families and arrange marriages and partnerships (Simon 1995). Although, this separation has not gone unnoticed by historians, who have attempted to make a distinction between the French "M**é**tis" and English "M**e**tis /half-breeds," Callihoo has demonstrated the reality of this boundary.

This social boundary is significant to how colonialism impacted Métis social structure in Lac Ste. Anne and the surrounding area. Carter (1997) argued that colonialism refers to the asymmetrical relationships and impacts that were created by highly varying administrative forces as a result of colonial rule (19). Similar to Frits Pannekoek's argument for social structures among the Red River Métis, the Lac Ste. Anne Métis (at least by Callihoo's account) seemed to internalize differences created by religious organizations, which subsequently influenced how they interacted with different Indigenous communities.[2] The Métis of Lac Ste Anne held significant economic power given their role in supporting the mission; however, the clergy encouraged colonialism by guiding inter-settlement interaction, further cementing religious boundaries. In the same area, this religious boundary is also seen in the nearby Alexis Nakota Sioux and Paul First Nations, which formed after Catholic and protestant members of the same group split from each other in 1880 (Andersen 1970). This finding is significant as it gives insight into how the religious narratives that this essay is challenging created new identities and realities for Indigenous peoples at Lac Ste. Anne.

CONCLUSION

The Greys Nuns and Callihoo have shed light on aspects of women's life in the Lac Ste. Anne settlement. If the arguments and opinions set out in the existing literature are taken as fact, then this site would support the assumption that women were unhappy, isolated beings living in a place lacking the

[2] There is a central debate in Métis history about the origin of Métis social structure at the Red River settlement, which Irene Spry and Frits Pannekoek have argued about. Spry argued that the Red River Métis society was organized around a distinct economic class structure, which was a position later widely adopted in Métis studies. In contrast, Frits Pannekoek argued that this class society originated from and was ratcheted by the clergy. Please see, Nicole St-Onge and Carolyn Podruchny, "Scuttling Along a Spider's Web: Mobility and Kinship in Metis Ethnogenesis." in *Contours of a People: Métis Family, Mobility, and History,* eds. Carolyn Podruchny, Brenda Macdougall, and Nicole St-Onge*,* (Norman: University of Oklahoma Press, 2012), 59–92.

comforts suited to their gender. Yet, when first person perspectives or "little histories" from the Grey Nuns and Callihoo are considered, narratives of life at Lac Ste. Anne change drastically. Specifically, their responsibilities, living conditions, mobility, and relationships with colonialism have exposed issues with the current religious history. The Métis community economically supported the nuns, and the nuns (albeit whose goal was to Christianize) took care of their congregation through physical and spiritual healing (Callihoo 1953; Huel 1996). Although the Grey Nuns' letters are brief, there is no reference to any hostile attitudes towards the Métis or Indigenous communities. Instead, the Grey Nuns passively advocate for the Métis in their writings to their Mother Superior, suggesting a more complicated reciprocal relationship, or at least one where power was still somewhat shared between the Métis and the missionaries. Like Erickson, this finding is not meant as an alibi for colonialism but to highlight the entanglements that existed within these religious racially mixed communities (Erickson 2011, 134). Similarly, having lived on the Northern Plains for generations, the Métis did not need to be "saved" as patriarchal narratives may suggest. Differences in lifestyles abounded in the Lac Ste. Anne settlement, and the religious community often did not understand Métis practices, such as the buffalo hunt. In the settlement, gender divisions were clear, and the Grey Nuns and Métis women had important responsibilities for the upkeep of the settlement. They embraced these responsibilities as they allowed them to be physically mobile across the landscape and defy "isolated" assumptions. Although Sister Emery admitted in her letters to Deschamp that she sometimes found herself quite lonely, she was also inspired by her purpose to do God's work (which included caring for the Indigenous communities; quoted in Drouin 1973). Despite what appeared to be productive relationships, inequality existed within the Lac Ste. Anne settlement. The Grey Nuns lived in a multi-roomed house, were well fed by the community, and had lots of livestock, while the Métis lived in much more modest conditions (quoted in Drouin 1973). As articulated in the historiography, one debate in western women's history has been whether the "West" was good for women (McPherson 2000, 75–86). Broadly speaking, the West appears to have been good for Lac Ste. Anne women; however, upon a more nuanced look, it is equally true that the settlement was better for some women than others.

Women's histories have exposed the issues with and cast doubt upon the dominant religious narratives at Lac Ste. Anne. These narratives marginalized both white and Indigenous women and perpetuated stereotypes to justify colonial actions (Albers 2011). White women were treated as second-class citizens that needed to be protected against the wilderness and its severities, while Indigenous women were almost completely left out of histories besides a few accounts that depicted the missionaries saving children from unfit mothers (Carter 1997; Drouin 1973). Both the Grey Nuns and Callihoo's accounts argued against these pejorative narratives. Simply, these women did not need saving and were understood as valuable members of the Lac Ste. Anne community entrusted to be teachers, doctors, farmers, and hotel owners, supporting the findings concerning women's roles seen elsewhere in fur trade era and post-fur trade era Canada (Racette 2012; Van Kirk 1999). Additionally, the Lac Ste. Anne case study has provided an example of how site-specific or "little histories" approaches can challenge a patriarchal narrative from subaltern perspectives (Barman 2008; Jameson 2008). Given the limited scope of this essay, it is difficult to extend this biography-specific approach to a national history, and even more speculative to extend this to a transnational history. Nevertheless, in the future, this topic would greatly benefit from a comparative analysis of

women's histories from other sites across the Prairies and on both sides of the border.

This essay has only focused on two case studies from the Métis community at Lac Ste. Anne, and given the existence of many recorded family and life stories, this research is far from complete (Anderson 1985; Davison 1982). Lac Ste. Anne was a complex community with missionaries subverting the autonomy of indigenous inhabitants through evangelism. That being said, relationships were not antagonistic as the missionaries depended on the Métis to survive in the Northwest. Reciprocally, the Métis needed priests and nuns to fulfill their religious needs, as well as educate their children and act as local doctors. These case studies have supported the notion that Métis communities were not isolated, but rather were part of specific kinship/religious/ linguistic networks that were regularly maintained by these families and influenced by the different clergies. Although this study was limited by its geographic and temporal focus, it is significant because the Grey Nuns' and Callihoo's stories have changed our view of Lac Ste. Anne, and thus have changed our understanding of colonial relationships and bias in the historical record and lent the site for future comparative studies.

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REVIEW ARTICLE

The Akkadian Cylinder Seal – Metonym for Life in Akkad

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ABSTRACT
Akkadian cylinder seals, though tiny physical objects, were useful and significant to the Akkadians. This work explores those uses and significances in order to understand the cultural complexity reflected in these small items. Religious scenes on cylinder seals detail the spiritual beliefs and practices of the time. The deeply intertwined relationship between religion and state power in Akkad is also present in the decorations of some cylinder seals. The materials from which cylinder seals are made indicate trade with distant groups and signal the passage of both materials and cultural influences between groups. These cylinder seals also reflect the complexities of daily life; politics, distribution of resources, the specialization of craftspeople, and art can all be read in these minute cylinders. As well, the making of cylinder seals was a technologically complex process, demonstrating sophistication of technique and of material choice that points to the sophistication of the people who made them. Ultimately, these physical and social properties of cylinder seals indicate that they had multiple meanings in the life of Akkadians.

Keywords: cylinder seal, Akkad, religion, trade, daily life, technology, culture

INTRODUCTION

In humanity's ancient quest to distinguish between "yours" and "mine," the people of the Ancient Near East developed the cylinder seal (Gorelick and Gwinnett 1981, 17). During the years of the Akkadian period in Mesopotamia (2350–2150 BC) the cylinder seal took on new meanings influenced by the cultural context of Akkad (The Metropolitan Museum of Art 2004). The Akkadians and their culture assigned various significances to cylinder seals and, through using them, connected the seals to the larger world outside of Akkad. Indeed, Akkadian cylinder seals are more than just a physical item to denote ownership; they reflect the cultural complexity of the Akkadians. By examining art, religion, trade, and social significances in the form and function of cylinder seals, this essay demonstrates that Akkadian cylinder seals are an excellent metonym for life in the domain of Akkad.

Akkadian cylinder seals are a well-researched topic, dating back to Sir Leonard Woolley's excavations at the Royal Cemetery of Ur in southern modern-day Iraq between 1922 and 1934 (Irving and Ambers 2002, 206). While Ur is the primary site at which Akkadian cylinder seals have been found (Porada 1960, 116), others have been discovered at Umma (Sax 1991, 91) and Mari (Kantor 1966, 147). Some researchers devote their careers to studying these information-rich items. Margaret Sax (1991) published numerous papers on the technological aspects of cylinder seal-making (Sax, Collon, and Leese 1993; Sax, McNabb,

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and Meeks 1998), and Edith Porada was posthumously called "the world's leading expert on Mesopotamian seals" (Possehl 2006, 42). While both women are experts in the field, their approaches to understanding Akkadian cylinder seals differed.

The research on Akkadian cylinder seals has been done with a variety of methodologies. Some researchers used highly technological approaches, such as Sax (1991) who used air-path X-ray fluorescence and energy-dispersive X-ray analyzers on minute paint samples present on some seals (91). These analytical tools survey the relative concentration of particular elements found in the paint used on seals through the reflection of secondary or fluorescent X-rays, providing information about material composition that can hint at other variables like age and provenance (Pessanha et al. 2019, 7). These types of X-rays are well-suited to examining the ancient and delicate cylinder seals as they are non-destructive (de Viguerie, Solé, and Walter 2009, 2015). Later Sax, Collon and Leese (1993) analyzed the crystalline properties of seals using X-ray powder diffraction and Debye-Scherrer cameras (78). X-rays travel through a powdered crystalline sample, and the dispersed reflections of those rays are analyzed from up to 20 different angles to reveal clues about the crystal's structures, properties, and makeup (Dutrow and Clark 2020). As used by Sax, these types of technology can provide information about a cylinder seal's material properties, its provenance, its trade routes, and the technology used to craft it. X-rays of many varieties are helpful research tools for unlocking the secrets held by cylinder seals.

In contrast, Porada (1960, 117) used both her extensive background knowledge and an in-depth visual analysis of the Sargonid cylinder seal to draw her conclusions. The Sargonid seal was a particularly noteworthy example of Akkadian cylinder seals, found by Sir Leonard Woolley in his excavations at the Royal Cemetery of Ur, and is thought to have been made during the reign of King Shar-kali-sharri (Porada 1960, 116). Porada engaged by studying the deeply thematic and artistic aspects of the seal and relating them to historic contextual clues from other Akkadian artifacts. By using visual and thematic analysis, Porada accessed different types of data than did Sax, poring over motifs and significances that were deeply entrenched in Akkadian context and culture. In this way, cylinder seals can be read as texts that, through the art of interpretation, can tell stories of the Akkadian people. While existing research touches on many aspects of Akkadian cylinder seals, the methodologies used to understand these amazing and miniature bundles of information can be as diverse and beautiful as the objects and as the culture that created them.

DEVELOPMENT OF AKKADIAN CYLINDER SEALS

As the history of research shows, the cylinder seals of the Akkad period are complex items, rich in cultural significance. They reflect a long tradition of technological development stretching back into the Paleolithic period where bead making in the Ancient Near East first began (Gorelick and Gwinnett 1981, 17). The development of stone beads eventually led to the distinctive shape of the cylinder seal, and ornamentation gradually became the varied and visually rich depictions of complex scenes characteristic of Akkad (Gorelick and Gwinnett 1981, 19). On the surface, these seals were intended to denote ownership of goods by rolling the seal through the clay that was used to seal packages. However, the seals also had other uses, such as being religiously significant, providing protection through magic, or being beautifully decorative (Gorelick and Gwinnett 1981, 19). Seals developed alongside other methods of marking items of material significance, such as stamp seals and hollow clay bullae containing incised clay tokens (Gorelick and Gwinnet, 1981, 19). As a result, the cylinder seal reflects the growth of urbanization that

had been slowly growing in the Ancient Near East since humans first began the process of agriculture. The history of the Akkadian cylinder seal demonstrates that these seals developed apace with Akkadian culture and that the growth of human life in Akkad is mirrored in the development of the cylinder seal, making the seals a wonderful metonym for Akkadian life.

AKKADIAN ART, RELIGION, AND CYLINDER SEALS

When looking at cylinder seals from Akkad, a common feature is their beautiful and richly detailed carvings. Kantor (1966) notes that the Akkadian style is easily identified by the accuracy of the physical details in the carvings' figures (146), while Porada (1960) points out that Akkadians distinctively focused on naturalism in their figural representations (116). The subject matter depicted on these seals can range from scenes of quotidian existence to views of the gods and the fullness of Akkadian religious life (Kantor 1966, 147).

One seal, as shown in Figure 1, demonstrates a religious scene, with gods and goddesses arrayed around lush landscape elements that would not have been typical of Mesopotamia at the time. The principal god figure sits on a throne of mountains, surrounded by verdant vegetation and flowing streams, a stark contrast to the alluvial plains and fields of agriculture typical of the area (Kantor 1966, 147). The Akkadian focus on naturalism, as depicted in the art of the cylinder seals, was a direct reflection of their desire to dominate the natural world (Kantor 1966, 147). In addition, the multi-layered horns on the deities of this seal are emblems of divinity and a signal to the authority held by the gods (Süring 1984, 330). These horns are also associated with the bull-god cult and directly relate to the expansionist views of the kings of Akkad, attempting to unite "the totality of the countries" under their rule (Lewy 1971, 735). No one better exemplifies this mix of religion and politics than the first king of Akkad, Sargon.

King Sargon of Akkad sought to create political unity when he seized control of what came to be Akkad, and carvings on seals from the time demonstrate his success by portraying the power the Akkadian gods had to legitimize both their domain and their rulers (Heinz 2007, 67). It was important for Sargon to spread

FIGURE 1—*Drawing of a seal from Mari (Kantor 1966). Reproduced with permission from the Journal of Near Eastern Studies, University of Chicago Press.*

material proof of his divinity and fitness to rule as he had made sweeping changes to Akkadian life in order to reinforce his claim to religious authority. One such change was a shift in religious focus away from An, the creator god, to the goddess Inanna, whose domains were love, sexuality, and war. In this shift, Sargon made his daughter the high priestess for Inanna in the city of Ur, thus giving her significant political and cultural influence with which to support her father (Schneider 2011, 22). By consolidating religious power within his family, Sargon was using religion to legitimize his rule. Though Sargon claimed to be descended from ancient Mesopotamian kings and had the birthright to be ruler, he was not actually of royal blood and could therefore have been considered a usurper, or someone illegitimately claiming royal power (Nigro 1998, 85). To keep the populace from rising against him, he engaged heavily in propaganda to give himself airs of legitimacy. Most of this propaganda is famous in Mesopotamian archaeological circles, such as the impressive Stele of Ishtar and Sargon's Stele; their size and intricate detail gave them archaeological celebrity. The cylinder seals bearing religious scenes of beauty and power are also propaganda because they send a subtler message about Sargon's right to kingship. The divine authority of the gods was demonstrated in the lushness of their carved surroundings, and by associating himself with that authority, Sargon proclaimed himself chosen by the gods and thus the legitimate ruler of Akkad (Nigro 1998, 86). Thus, the cylinder seals from this time reveal the fascinating dynamics of political legitimacy and the conquering of the natural world within the religion of the Akkadian period.

It is within this complex interplay of political legitimacy, religious power, and artistic motifs that cylinder seal's metonymic qualities can be seen. These beads demonstrate important factors of daily Akkadian life, as ancient Akkad and its quotidian rhythms were permeated with religion. Religious personnel worked both in and out of temples, and religious myths were regularly told to provide structure and guidance in everyday situations (Schneider 2011, 6). Cylinder seals are often adorned with religious themes because of how pervasive religion was in daily Akkadian life. In addition, the political structure of Akkadian life was just as omnipresent in regular Akkadian affairs. As king, Sargon used his political will in a way that would have had an immediate impact on the life of Akkadian citizens, such as dictating local architecture, deciding the administrative and physical organization of towns, and forcing populations to relocate if he so chose (Heinz 2007, 67). The political forces of Akkad could be felt in the regular lives of Akkadian citizens and therefore became common themes in cylinder seals. The depictions of religion and politics on cylinder seals are an accurate reflection of life for ancient Akkadians, making the seals an excellent metonym for the power of gods and kings in Akkad.

TRADE, AKKAD, AND CYLINDER SEALS

Cylinder seals from Akkad reflect the deep importance of trade to Akkadian life. Sargon of Akkad had changed the economic basis of his domain by shifting economic control over the far-reaching networks of trade through his palace and away from the priesthood (Heinz 2007, 68). This secular change in economics was accompanied by a shift in materials used to create cylinder seals, a change precipitated by trade. As Sax, Collon, and Leese (1993) note, Akkadian cylinder seals were made of extremely hard stone, like serpentinite and greenstone, that are not found natively in the lands of the Akkad domain and were likely imported (79). When the Akkadian "empire" was interrupted by the Gutian invasions, the existing trade network dissolved and subsequent historical periods are characterized by softer stones that were sourced from an area closer to home (Sax, Collon, and Leese 1993,

80). Other materials were also used to create cylinder seals in the Akkad period such as shells from coastal areas, lapis lazuli from Afghanistan, and rock crystal of unknown provenance, which demonstrates the existence of strong trade networks within Akkad (Sax 1991, 91). These examples point to the influence of trade on cylinder seals within Akkad, but Akkad also influenced other groups through trade.

Trade saw the exportation of Akkadian influence to additional Mesopotamian groups. The Hurrians resided north of Akkad, and Akkad's presence was heavily felt by this group living in the Anatolian plains. Traded obsidian of a foreign source was found in a Hurrian palace, and the stone was heavily incongruent with Hurrian practices, suggesting Akkadian influence in the region (Frahm and Feinberg 2013, 1123). In this palace a cylinder seal impression was found, bearing a legend that gave tribute from the Hurrian leader to the Akkadian king Naram-Sin and his daughter. There may have been an alliance between this daughter and the Hurrian king, suggesting that the Akkadians were trying to exert control over Hurrian trade, possibly resulting in the influx and importance of obsidian (Frahm and Feinberg 2013, 1123). The traded obsidian was used to create fine tools, mostly flake and blade. Obsidian, when handled properly, can produce a very sharp edge and can become tools that would have been extremely useful in the creation of cylinder seals (Frahm and Feinberg 2013, 1124). Even outside of Akkadian-made cylinder seals, the importance of trade is intertwined with these tiny yet informative objects.

Hurrian tools were not the only example of Akkad's enormous hunger for trade. Ten Akkadian cylinder seals were found at the citadel of the Anatolian site of Seyitömer (Bachhuber 2013, 504–505). As their primary purpose was to denote ownership, the seals at this site suggest at least some level of Akkadian administrative control in these northern areas of Mesopotamia. However, seals at the Seyitömer site could also have been used for decoration or amuletic protection. Regardless of the ultimate purpose of those seals, their presence in Anatolia points firmly to an established network of exchange between Akkad and the cultures that surrounded it (Bachhuber 2013, 506). The metonymic properties between cylinder seals and Akkadian life can be seen in the trade that helped to create the seals.

By demonstrating the economic connections between Akkad and the various groups with whom they had trading relationships, cylinder seals reflect the economic life of Akkadians. Ancient inscriptions bear witness to King Sargon's vast trade networks, with ships sailing to exchange goods in many places, including what is now India. These ships brought to Akkadians a wide array of imported goods, including luxury materials like metals, ivory, beads, and precious stones (Mallowan 1965, 2). Many of these materials reflected Akkadian wealth and prestige, themes that were echoed in the material quality and narrative carvings of some cylinder seals. Those seals indicated the real-life importance of Akkadian trade in the movement of goods, but they also portray trade's movement of people. Beginning with King Sargon, trade had come under the control of the palace, but palace officials did not employ middlemen to go between the traders and the buyers. Instead, it was usually individuals who purchased luxurious and expensive trade goods directly from tradesmen, leading to new relationships and exposure to different cultural influences (Stech and Pigott 1986, 41). These influences could lead to wider cultural shifts, such as changes of decorative styles, shifts in preferred materials for construction, or new kinds of narratives being told. As a result, cylinder seals embody the Akkadian experiences of trade in both the goods to make them and the cultural influences that gave the seals meaning. Trade was a necessary and active part of Akkadian life in

many ways, and the metonymic cylinder seals are carved with the importance of Akkadian trade.

SOCIAL SIGNIFICANCES OF AKKADIAN CYLINDER SEALS

The physical qualities of cylinder seals are also of vital importance due to their place in Akkadian life. As previously mentioned, the seals were perfunctory in that they put a stamp of ownership on whatever goods they embossed (Gorelick and Gwinnett 1981, 19). In addition, they were also often worn as jewelry by being threaded onto a necklace, becoming both a symbol of status and of artistic decoration (Gorelick and Gwinnett 1990, 47). That status and decoration may have served to elevate the owner (in a display of self-promotion) in the eyes of other Akkadians. For example, a hunting scene showing a man spearing ibexes could have served to display the man's power and prowess, as Akkadians saw man's domination over nature as a spiritual right and a demonstration of divine power (The Metropolitan Museum of Art 2020; Porada 1960, 118). The seal impressions of such a man might communicate his status to others, an act of self-promotion that exhibits his upward mobility in the social ranks. Another mark of status occurred alongside the progress of written language in the Akkadian period. Inscriptions on cylinder seals became more prominent at this time, demonstrating either the literacy of the seal's owner or his ability to pay for an inscription from a scribe (Pittman 2013, 323). Clearly, cylinder seals could reflect the personal power of an individual, but they also had other socially significant uses.

As has been noted, cylinder seals could represent political ties through alliances and religion. One such seal proclaimed the allegiance of a governor of the Akkadian province of Lagash to Shargalisharri, an Akkadian king (Frankfort 1939, 9). As we have seen, this intermixing of religion and power is also important for religious symbols as they were a frequent motif in Akkadian cylinder seals. Political power was of divine origin, and because Akkadian cities each had their own patron deity, religious scenes inscribed on cylinder seals may speak to the power of the seal's owner through the favoured god (Pittman 2013, 335). Politicians were not the only ones to find power in cylinder seals; even those who decorated the seals may have found power through their carvings. The shifting economics of Akkadian life began to give more clout to the artisans responsible for making cylinder seals, and it seems as though these artisans were using artistic license to create their own designs, moving away from the dictated wishes of others (Amiet 1980, 40). The political influence necessary to alter the established social fabric is noteworthy and speaks to the changing fabric of both political power and of wealth. Unequal distribution of resources is also demonstrated by the material origins of cylinder seals. Such affluence is suggested in some seals found at the Royal Cemetery of Ur that were made of expensive imported lapis lazuli (Gorelick and Gwinnett, 1990, 50). The social significances of power and wealth are intricately tied to the decorations and carvings of Akkadian cylinder seals.

It is not only the rich materials of a cylinder seal that point to wealth; the decorations on the seal can also be valuable. The Akkadian period is noteworthy for its intricate attention to detail, and the figures on the seals of this time are far more realistic and individualized than they had been in previous eras (Pittman 2013, 334). The more complex and detailed a figure, the more time and attention it required, driving up its cost. Cylinder seals can also point to the economic relationships between the artisans who made them and the patrons who commissioned them, demonstrating the specialization in craft that came from the surplus of wealth arising from intensive food production (Eppihimer 2014, 320). Even the development of written literary traditions finds

its way into cylinder seals, as some depict the epic hero Gilgamesh. These carvings suggest an influential relationship between the various artforms, including literature and visual arts, in which the Akkadians engaged (Lambert 1979, 5). Clearly, cylinder seals reflect many aspects of Akkadian social and cultural complexity, but the seals' metonymic properties run even deeper.

The Akkad seen in cylinder seals parallels the true complexity of wider Akkadian culture. An example of said complexity is the phenomenon of fictional Akkadian autobiographies, which were written to enhance one's social standing, to feed into narratives of obtaining and retaining power, and to explain or predict various social happenings (Longman 1991, 44). One such example is a fictional autobiography of the god Marduk, meant to explain Marduk's origin and to legitimize the god in the Akkadian pantheon (Longman 1991, 45). Marduk's fictive autobiography bears similarities to King Sargon's attempts to legitimize himself and the earlier-referenced cylinder seal carvings that propagandized his divine authority. Cylinder seals were therefore an accurate snapshot of Akkadian social and cultural significances. In addition, Akkadian glyptics were a visual art form that often portrayed political and social figures in exaggerated heroic detail that blend narrative and historical influences (Briggs 1957, 48). These glyptics and their narratives were a great influence on the carvings of Akkadian cylinder seals, as heroes were often part of the imaginative iconography characteristic of Akkadian seals (Porada 1993, 568). Both the fictional autobiographies and Akkadian glyptics are significant cultural elements that rearrange form and time to understand and characterize important people and moments. By reflecting themes of political legitimacy and hero-making from life to carving, Akkadian cylinder seals echo Akkadian culture. Akkadian cylinder seals filled many complex social and personal roles for the Akkadians, reflecting the cultural complexity of the people who created and used them.

CONCLUSION

The information present in cylinder seals of the Akkadian period provides a detailed, though incomplete, account of life in Akkad. Akkadian kings legitimized their power through the influence of religion, and the religious significance of dominion over nature are reflected in the art of Akkadian cylinder seals. The materials from which these cylinder seals are made speak directly to the prevalence and importance of trade during the Akkadian period and the complex interconnections of social life are present in the look and use of Akkadian cylinder seals. While these aspects of Akkadians, as well as their cylinder seals, have come to light, further research would provide a more holistic understanding of the seals and the role they played in Akkadian society. These amazing artifacts and the information they hold are vital to understanding the prosperous and successful Akkadian domain. As archaeology must extract abstract and contextual information from the material remains of culture, Akkadian cylinder seals provide an excellent and complex source of this vital information. Indeed, Akkadian cylinder seals are truly a metonym for life in Akkad.

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REVIEW ARTICLE

Reorienting Bioarchaeology for an Era of Reconciliation

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ABSTRACT

Anthropology, in general, has recently been working toward reworking their systems to be better suited to the needs of descendent communities. Bioarchaeology, however, has been slower to adopt these efforts. In the spirit of reconciliation, it is important for all disciplines to self-reflect and critique the colonial systems that have been institutionalized their teaching and research. This paper serves as a theoretical exploration into the current practice of bioarchaeology and seeks to provide a theoretical model that could contribute toward the decolonization of the discipline to be appropriate for application in Canada. It discusses how to better orient theory to compliment ancestral knowledge and reorganize bioarchaeology so that it could be more useful to responding to the Truth and Reconciliation Commission of Canada Calls to Action (2015) and benefit the needs of descendants. It will proceed by reviewing the integration of social theory in bioarchaeology, providing a critique of the biocultural approach, and finish by proposing a theoretical model that seeks to contribute to the ongoing decolonization of bioarchaeology. The model that this paper proposes serves is a suggestion of how to better structure and conduct a project including ancient human remains to better optimize the application of archaeological theory as a compliment to traditional knowledge. It is formed on the bases of theories of personhood, shared histories, behavioral archaeology, and biocultural approaches to provide a pragmatic synthesis of theory for a community driven bioarchaeology.

Keywords: bioarchaeology, reconciliation, archaeological theory, community-driven practice

INTRODUCTION

There is a recent focus in archaeology to decolonize and counteract the perpetuation of imposed colonial stereotypes (Atalay 2006; Harrison 2014; Supernant 2018). Some archaeologists have sought to reach these goals through collaboration, creating and employing Indigenous Archaeology as their main theoretical background (Lightfoot 2008; Nicholas and Andrews 1997; Nicholas et al. 2011). Divisions of bioarchaeology have recently been following archaeology by incorporating social theory, approaches which focus on the social experience of a person within a cultural system (Agarwal and Glencross 2011a), into research; however, it has not quite reached the same level of collaboration and deportation from strict processual thinking (Carr 1995; Meyer and College 2017). Moreover, bioarchaeological studies and social theory often have a habit of overlooking the personhood of the individual, the experience of people, and non-systemic human interactions (Fowler 2004). Objectifying practice through the imposition of strict theory makes bioarchaeology often unsuited to practice in Canada because it

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imposes generalized interpretations, often from one side of the colonial divide (Martindale 2014).

To strive toward a holistic, community-driven, impactful bioarchaeology, it is crucial to transcend the processual versus post-processual debate to encapsulate the most advantageous application of theory and approach for the purpose of meaningful practical research under the umbrella of a pragmatic synthesis in archaeology (McNiven 2016; Preucel 2006; Trigger 2006). Employing project-specific approaches will work to reconcile the turbulent past of bioarchaeology and direct its practices towardconstructive circumstances that go beyond excavation and focus more on the preservation and protection of burial contexts. The addition of project-specific methods will only enhance the efficacy and impact of future studies (Ames and Martindale 2014; Thomas 2016) and reintroduce bioarchaeological studies to Canada that are applicable to the Calls to Action set forth by the Truth and Reconciliation Commission of Canada (2015). Avoiding addressing the reorientation of the discipline in concordance with Canadian standards has driven bioarchaeology to be focused elsewhere than in Canada. Encapsulating this claim, Zuckerman and Armelagos (2011) indicate that "to constitute a socially and scientifically valid endeavor, anthropological research must be relevant to contemporary societies" (28).

Throughout the past decades there has been a spike in the adoption of biocultural approaches, or the incorporation of social theory in bioarchaeology (Agarwal and Glencross 2011a; Martin 2013; Zuckerman and Armelagos 2011). This has propelled the field from descriptive accounts of skeletal material into a conversation of the livelihood of past cultures (Buikstra 1977; Turner and Klaus 2016; Zuckerman and Armelagos 2011). This paper seeks to propose a theoretical model that holistically fuses biocultural and humanizing theory to form a framework to be manipulated by the needs of communities and strive toward the decolonization of bioarchaeology as practiced in Canada. This framework will address the preservative limitations of the archaeological record, consider the chemical analysis of bone, and go beyond scientific deductive practices to analyze the cultural and social climate in which people lived. For paleo-projects, this will be a way to better optimize material and knowledge; for historical projects, this will advance the cohesion of archaeology with indigenous communities. Moreover, it will address the limitations of bioarchaeological knowledge and emphasize the integral role of expert and informed positions in making inferences (Milner and Boldsen 2014; Weise et al. 2009). This paper will propose a new synthesis that goes beyond typical bioarchaeological analysis to fully incorporate archaeological theory and ancestral knowledge, from the stage of project conception, on the material basis of ancient human remains.

In response to Agarwal and Glencross's (2011b) book *Social Bioarchaeology*, Schiffer's (1975) *Behavioral Archaeology*, and the existing *biocultural* approach in anthropology, the following proposed theoretical model will seek to conceptualize calls for the inclusion of social theory within a new cohesive framework that incorporates both the social and the scientific in bioarchaeological research. The proposed model begins with the determination of project intentions, focused around four components (environmental contexts, human biology, social determinants, cultural systems) that help direct the researchers toward available sources of data. Data from these four components are then considered in a reciprocal nature, each affected by and affecting other components. Finally, derived from behavioral archaeology, cultural and environmental alterations to the human remains are observed to round off interpretations. The proposed incorporation of this model will aim to develop a practice-specific pragmatic approach for use in community-driven bioarchaeological contexts. Essentially, this model is a logical

approach that is often applied informally in archaeology but has not been conventionally or ubiquitously adopted into a theoretical model. Throughout this paper, the discussion is centred around archaeological theory as a way to compliment traditional knowledge. Therefore, even though theory is the main focus, this model serves as an avenue by which supplementary data can be obtained in contexts where the exploration of archaeological knowledge is wanted by descendants.

A CALL FOR SOCIAL THEORY IN BIOARCHAEOLOGY

Decades after its processual conception (Buikstra 1977; Martin, Harrod, and Pérez. 2013; Nystrom 2018), the recent direction of bioarchaeology, or social bioarchaeology, has diverted from focusing on descriptive accounts of paleopathological lesions, demographics, and skeletal features to accessing the social and cultural underpinnings of such evidence (Agarwal and Glencross 2011a; Buikstra 1977; Trigger 2006; Turner and Klaus 2016; Zuckerman and Armelagos 2011). With the addition of social theory and the adoption of holistic methods, bioarchaeology has begun to counteract its originally crude and over-simplistic views of identity (Larson 2002; Turner and Klaus 2016). Martin, Harrod, and Pérez (2013) highlight this call for rapprochement in that "bioarchaeology research needs to be guided by an ethos of responsibility and ethics, and that can only be sustained if social theory and ethics are embedded in the ways that it is taught to future generations of bioarchaeologists" (243). Despite these strides toward a social bioarchaeology, much of the field still leans toward processual, hypothesis-driven approaches. Many leaders in bioarchaeology remain divided in this sense due to the lack of structure behind social theory in a biological setting.

Perhaps the slowness of bioarcheology to reorient toward a more post-processual model is rooted in the biological regularities of the human skeleton and the scientific nature of such evidence. Therefore, bioarchaeologists are dealing with one of the most direct sources of life in archaeology and are less prompted to expand into the social realm (Meyer and College 2017). The human skeleton, however, is not independent of social and cultural modelling and provides a unique window into the past (Larson 2002). In their book *Social Bioarchaeology*, Agarwal and Glencross (2011a; 2011b) posit that human remains represent a final expression of the social context of the culture they represent. They conceptualize a social bioarchaeology as "reconstructing the biological footings of the skeletal body and cultural framework that has together created the social spaces and the social creatures that inhabit them" (Agarwal and Glencross, 2011a, 3). To do so, bioarchaeologists have been integrating social theory into their interpretations. For example, we see social theories applied to the study of sex, gender, and identity (Holliman 2011; Zakrzewski 2011); the spatial analysis of the social organization of ancient cemeteries (Ashmore and Geller 2005); the study of the stigmatization and care for those with disabilities or diseases (Roberts 2011; Tilley 2015); and even the re-examination of mortuary interpretations and basic bioarchaeological units such as age (Rakita and Buikstra 2005; Sofaer 2011). This list is not even remotely exhaustive; however, it does exemplify that all aspects of bioarchaeological study can be undertaken through, and benefit from, the lens of social theory.

Many aspects of human life, such as individual and group identity, cannot be studied independently from social theory and community engagement. Strict processual methods do not consider the people behind the human remains and the multi-dimensional life history that the remains represent. Although still based in evolutionary theory (Huss-Ashmore 2000), the studies of both ancient and modern human remains are now undebatably integrating cultural factors into their studies in some form

(Turner and Klaus 2016). The inclusion of social theory adds to the dietary, health, and diverse breadth of information that is represented by human remains (Agarwal and Glencross 2011a; Larson 2002). There is, however, a need for an integrative approach that considers multidisciplinary, multi-evidenced, multi-theoretical approaches that incorporate study beyond physical remains (such as oral history, ethnography, agency, social memory, etc.; Thomas 2016). Moreover, this need extends to the gap in social theory that often negates the personhood of human remains (Fowler 2004). These changes in scope and practice toward a socially focused analysis that compliments traditional knowledge have been largely adopted in anthropology and are becoming more popular in bioarchaeology; however, their application in the latter has not been as succinct.

THE BIOCULTURAL APPROACH

Derived from Livingstone's (1958) seminal paper, *Anthropological Implications of Sickle Cell Gene Distribution in West Africa*, and the *New Archaeology* movement in the 1960s (Blakely 1977; Buikstra 1977; Turner and Klaus 2016; Zuckerman and Armelaglos 2011), the integration of cultural factors as stressors for adaptation has run rampant through the field of anthropology (Zuckerman and Martin 2016). Livingstone (1958) considered the unusual spread of the sickle cell gene from a perspective beyond that of strict scientific selection to conclude that it was a response to the heightened instances of a strain of malaria (*Plasmodium falciparum*) in humans as a result of the population spike during the Agricultural Revolution, a cultural change. From this came the revolutionization of anthropological thought and epidemiological studies toward the consideration of culture as a mechanism that imposes selection rather than as a variable independent to human biology, which resulted in the development of the *biocultural* approach (Blakely 1977; Zuckerman and Martin 2016).

Agarwal and Glencross (2011a) describe the biocultural approach as "best exemplified in population-based bioarchaeological studies that strive to interpret indicators of health and disease as adaptive responses of the skeleton to large-scale change," (1). More generally, Zuckerman and Martin (2016) say that "the biocultural approach attends to both the intertwined biological and cultural aspects of any given human phenomena" (7). This approach is a direct result of an attempt to expand the processual views of science to incorporate cultural environments alongside natural environments. Herein culture is rationalized as both an evolutionary stressor and a social phenomenon as a way to liaise processual and post-processual agendas.

Thomas (2016) employs a biocultural model in his anthropological work on Quechua culture in Peru as a method by which to weave social theories, disciplines, and sources of evidence to achieve practically meaningful research for the sake of the people. In this anthropological setting, the biocultural approach is extremely useful; however, this has proven harder to employ in a bioarchaeological context. Returning to Agarwal and Glencross's (2011a) definition of a biocultural approach to bioarchaeology and its current model, it is evident that it employs an adaptationist perspective and dehumanizes culture into both an adaptive mechanism and active agent imposing selection rather than a function of people. In this sense, it neglects the main constituents of personhood and agency. Their inclusion of culture into a processual framework attempts to analyze post-processual ideas through a scientific lens which, frankly, limits the role of the people who are represented by the remains. Herein culture is considered either a buffer or a stressor (Martin, Harrod, and Pérez 2013; Zuckerman and Armelagos 2011), which is a fairly inhuman way of conceptualizing a framework made up of the lives of past

people. This incorporates cultural context more than social variables. Social aspects of human culture are often acted out for reasons other than functionalist adaptations to stress or in response to environment. Motivation forms the basis of most human agency, and the actions, beliefs, and relationships between individuals shape the personhood of the people who make up the culture in question (Fowler 2004). For example, there is bioarchaeological evidence that illustrates that past people often took care of injured members of society (or people with disabilities or illnesses) which demonstrates notable acts of altruism and compassion (Tilley 2015). These acts would not have been advantageous at the individual or group level of selection under an adaptationist paradigm.

The biocultural approach is optimized in historical and ethnohistorical studies that look at quantifiable phenomena such as ancient health, development, violence, stature, demography, etc. (Turner and Klaus 2016). As such, it is optimized for studies that look at the physiological or biological evidence of cultural and environmental stress (Blakely 1977). The feedback-oriented framework of the biocultural approach assigns the role of culture within a continuous cycle that incorporates the previous stresses as new aspects of the cultural and natural environment (Martin, Harrod, and Pérez 2013; Zuckerman and Armelagos 2011). This approach also neglects the reciprocity of factorial and stress influences by considering them in a cyclical, forward-moving, teleological fashion.

In Yanagisako's (2005) work *Flexible Disciplinarity: Beyond the Americanist Tradition*, he critiques the biocultural approach for prioritizing adaptationist thinking and needing to be expanded to shed its reductionist title (quoted in Zuckerman and Armelagos 2011). The proposed model functions under the same critiques but does not share his position that this is an example of a four-field approach distancing specialized aspects of anthropological research. On the contrary, it argues that the biocultural approach is a noteworthy attempt to interlace processual and post-processual schools of thought into a conversation of human and cultural evolution, but it simply neglects the post-processual focus on the people behind the systems. Such a reorganization of anthropological thinking into an organized model that activates human impact is beneficial; however, this could be taken one step further in bioarchaeology by rehumanizing culture with studies of personhood to compliment traditional knowledge. The human experience encompasses both behaviour and culture and can only be fully conceptualized when these aspects are considered concurrently. Moreover, the strategy of broadening research questions, as in biocultural studies (Zuckerman and Martin 2016), threatens the ability to consider the person rather than the process and thus risks falling back into the processual paradigm of generalizing and dehumanizing the past. Thomas (2016) challenges academia to "work with the social and natural sciences towards ends that truly *serve humanity*," and to "reevaluate their construction of *truth* and *whom it serves*," (30, emphasis added).

A MODEL TOWARD DECOLONIZATION

Upon the reanalysis of anthropology as a discipline (and therefore archaeology and bioarchaeology) in this era of reconciliation, it is crucial to employ solution-focused thinking and implement inclusive models that go beyond consultation and activate the role of communities in their own research (Harrison 2014; Rico 2017). Moreover, this assures that communities, whose perspectives on the past are often not considered as expertise, are partners in making informed inferences (Rico 2017). In this sense, a consultant role is employed by the archaeologist rather than by the community (Köpe 1997). Harrison (2014) discusses the concept of *shared histories*,

contending that to cease the imposition of harmful stereotypes, research needs to stop being approached from either the side of the "Colonizer" or the "Colonized." This, however, does not mean disregarding the historic unequal balance of power and violence towards an end of cultural appropriation. It means that co-operation under a common goal is the avenue by which the totality of human history can be approached without reinforcing colonial narratives (Harrison 2014; Hillerdal, Karlström, and Ojala 2017).

The Truth and Reconciliation Commission of Canada (2015) states that "[r]econciliation requires that a new vision, based on a commitment to mutual respect, be developed," (VI) and defines reconciliation as "the re-establishment of a conciliatory state," (6). Bioarchaeology has a tainted past of compromised (to say the least) ethics, especially when concerning Indigenous peoples in North America. This is similar to the origins of most anatomical and medical knowledge (Halperin 2007). Archaeology continues to change to suit the post-Truth and Reconciliation era (Supernant 2018), but bioarchaeology has yet to re-enter Canada under this new paradigm. Currently, bioarchaeology is often discouraged in Canada, causing research to be focused in other countries. Nicholas and colleagues (2008) state that the frequency of positive collaborative studies of human remains in Canada "will likely increase as greater understanding of Aboriginal concerns is reached by archaeologists, facilitated by new approaches and protocols regarding the study of human remains developed by First Nations in Canada and the United States" (234). Waiting on protocol and practice to meet the needs of descendent communities has resulted in bioarchaeology rarely addressing Canadian stories. Instead of avoiding sensitive areas, bioarchaeology as a discipline should be reorganized to serve as a community heritage management and mitigation resource that explores avenues that do not necessarily include excavation. A reorganization of focus would allow bioarchaeology to be reintroduced as a tool to manage, promote, and rekindle cultural linkages that were broken and discouraged by Canada's historically unjust treatment of Indigenous peoples (which falls exactly in line with the Calls to Action included in the *Final Report of the Truth and Reconciliation Commission of Canada* (2015). This reorientation is especially important to better respond to Calls to Action 73 through 76, which address the location, commemoration, protection, and reburial of the missing children from residential school cemeteries.

A great example of a recent Canadian bioarchaeological study that is fitting with these themes is the large-scale project addressing the recently uncovered ancient remains of Shuká Káa (Lindo et al. 2017). Each stage of the study was conducted in partnership with numerous First Nations, from seeking permission to conduct DNA analysis, to the interpretations intended for publication and the repatriation of the remains. The study found genetic continuities spanning over 10,000 years and contributed to knowledge about the peopling of North America and affiliated these Shuká Káa with modern Indigenous groups (Lindo et al. 2017). Another example, also from British Columbia, is the Journey Home Project between the University of British Columbia's Laboratory of Archaeology and the Stó:lō Nation (Schaepe et al. 2015). Herein ancestral remains were returned to the Stó:lō in a collaborative effort that developed a specific protocol that fit the needs (repatriation) and wants (information on the individuals to be repatriated) of the community. Bioarchaeology played a key role by providing profiles of these people, a process that was entirely directed by the community with the consultation of bioarchaeologists (Schaepe et al. 2015). These are both excellent examples of how bioarchaeology can be reoriented to work in Canada, in a way that is relevant to and conducted with First

Nations communities to access the deep history of Canada.

Akin to archaeology, bioarchaeology can be adapted into a serviceable avenue to address the marginalization and suppression of Indigenous culture (Lewis 2018). This consultant approach would guide what questions were to be asked within the aims of the project and the partnership with the community, optimizing the meaningfulness of its impact (Köpe 1997). Structured properly, bioarchaeology is an avenue by which Canadian stories can be told, repatriation can be prioritized, and heritage can be preserved. Moreover, archaeology and bioarchaeology are perfectly situated to be able to corroborate Indigenous heritage as an expert witness, legitimizing non-Western views in a Western legal system (Hogg and Welch 2020; Martindale 2014). For example, archaeological data was among the evidence used to argue the Supreme Court of Canada case of Tsilhqot'in Nation versus British Columbia. Herein the Tsilhqot'in Nation sought Aboriginal title and received a successful judgement with the help of archaeological data that illustrated their long-standing occupation of their traditional lands (Hogg and Welch 2020; Tsilhqot'in 2014).

In many ways, the non-critical incorporation of non-pragmatic theory in archaeology dismisses the role of communities by limiting the potential for "alternative" (under Western philosophy) evidence. It also divides the discipline and restricts communication between academics of different theoretical camps (Ames and Martindale 2014). Beyond this, archaeological theories developed in a certain area often weaken as they are applied to different cultures (Perry 2018). This is also the case, to come extent, for general archaeological theory being imposed onto bioarchaeology. Analogies crumble without continuity, laws of behaviour are unrealistic, and generalizations marginalize communities. Bioarchaeology straddles the processual and post-processual divide and has been trying to transcend this barrier since the introduction of the biocultural model. In order to best manage the limitations of the bioarchaeological record, it is important to tailor research questions, and thus the research methods and theories employed. The reality that different theoretical camps cannot incorporate all archaeological scenarios does not mean that they need to be discarded; it means that they need to be modified to fit specific contexts (Trigger 2006). A *pragmatic synthesis* of archaeological theory has been proposed for archaeologists to be better able to suit their community-driven research and contributions to the discipline and to manage the limitations of theory and archaeology (Martindale 2014; Preucel 2006; Trigger 2006). It is under this guise that this model is based, tying together the most suitable aspects of different theories to be applied as complimentary tools for the sake of the project. Due to the relative lack of bioarchaeology-specific theory, this discourse will incorporate archaeological theories employed in a bioarchaeological setting.

A theoretical model more suited to decolonization, such as the proposed, would comingle theory to best optimize project goals and place a strong focus on the consideration of, and search for, personhood. Promoting research in this way would likely result in more meaningful studies of past life. Personhood is the strategy of an individual to navigate and shape the cultural structure of their social interactions (Fowler 2004). A theoretical approach already known to bioarchaeology that focuses on the individual for detailed account of dynamics within a population is the *bioarchaeology of individual life history*, an approach that considers the individual as evidence of the inner workings of a population and as an important unit of society (Zvelebil and Weber 2013). This approach, however, is rooted in processualism and focuses on osteology, bone chemistry analyses, and genetic studies (Zvelebil and Weber 2013). Nevertheless, the bioarchaeology of individual life

histories is relevant to this paper as the proposed model will employ this general avenue of thinking while focusing on personhood, weaving archaeological theory into a net tailored to the research question. A pragmatic synthesis of theory is crucial to achieve this because things such as personhood, ideology, and social relationships are difficult to infer from material culture. In his book *The Archaeologies of Personhood*, Fowler (2004) mentions that personhood is often excluded in social archaeology and theory but should be considered in how individuals reciprocally interact and change alongside their culture and personal relationships. Information on personhood can manifest in the archaeological record through things such as practice, kinship, gendered materials, skeletal modification, exchange, life stage, and social stratification (Fowler 2004). Similar approaches and evidence are also interpreted into a *bioarchaeology of community* (Becker and Juengst 2017).

The proposed model provides a framework under which to undertake bioarchaeological research that is constructed in the interests of the communities who benefit from the specific project. It will offer a framework under which to incorporate theory as supplementary materials and be able to structure future bioarchaeological studies for successful outcomes such as the Shuká Káa (Lindo et al. 2017) or Journey Home (Schaepe et al. 2015) projects. It does not contend that bioarchaeology should be imposed, but rather that such tools should be accessible and optimized to benefit descendants. This could include the repatriation, preservation, or excavation of human remains, especially those who are at risk. This model seeks to manage the bioarchaeological record by whatever mitigation strategy is best suited, beyond solely the realm of exhumation. This would include the incorporation of interdisciplinary sources and cooperation between the four fields of anthropology, extending beyond strict bioarchaeological methods. The proposed model could also be applied more generally to the archaeological record; however, the scope of this paper solely considers its employment in a bioarchaeological setting.

Framework

The following model intends to provide a series of steps to be employed in conjunction with the descendent community and members of a team to narrow down a desired impact. First, the overarching research intention must be identified. That could be the preservation, salvage, repatriation, or study of both physical and knowledge-based heritage from a bioarchaeological or mortuary setting. It is the statement of these intentions that determines the emphasis placed on each of the four components of study (which will be outlined in the following section), and therefore the bank of theoretical background that could contribute. Second, depending on the goals of the project, the scope can be narrowed. In the realm of doing research for research's sake, one might try to completely incorporate the material under a more general research question (as in the biocultural model). This, however, can be harmful because the scope of study greatly influences the visibility of social and cultural dynamics (Meyer and College 2017). More specific research questions tailored to meaningful goals will be better suited to their specific context. The compilation of goals will build to a larger scope if so desired. Under this framework, the focus is on serving the needs of the community and emphasizing minimally destructive avenues (McNiven 2016; Thomas 2016). This model suggests that, if a broader picture is desired, this be approached in terms of differing aims so that specific considerations can be made when integrating both alterations and components of study (explained further in the following sections). Finally, interpretations must employ dialectic logic (Nuzzo 2010) and be made in a circuitous fashion (similar to a positive feedback loop, but

without order or sequence). Unlike the existing biocultural approach, the goal is not to impose social theory onto physical theory (or vice versa), but rather to present both as evidence that reciprocally influence a holistic interpretation as they would have in life.

Interpretations should be made by looking at a bank of scientific, social, and knowledge-based information compiled using various theoretical approaches. Under this framework, motivation alters the focus of the research, and the accessibility of past resources (according to temporality) alters the weight of study components and alterations (further explained in the following sections). The focus will not be on "culture" as a deterministic factor but rather will include the people within the culture and their social agency. The further the site dates from the study, the heavier the reliance on concept-based theory to unearth social aspects of human life. For more historic cases, an ethnographic or knowledge-based perspective approach would complement this. To do so, the ongoing integration of ethnography, as well as Indigenous oral history and perspective, as *capacity-building* evidence is crucial (Rico 2017). Without this, we are back to treating culture as an impersonal entity as in the biocultural approach.

This model modifies the biocultural approach and incorporates specific aspects of *behavioral archaeology*. Stemming from the New Archaeology movement in the 1970s (LaMotta and Schiffer 2001), behavioral archaeology seeks to produce laws that can be applied to observe interactions between people and materials (behaviours) in the archaeological record (LaMotta and Schiffer 2001; Reid, Schiffer, and Rathje 1975; Schiffer 1975). Much like the biocultural approach, this nomothetic approach is based in processualism and attempts to explain human behaviour through the cross-cultural application of laws to observe more post-processual ideas (Trigger 2006). It functions under the guise that the archaeological record is a distorted view of past societies (Johnson 2010) and that *c-transforms*, the cultural alterations to archaeological sites, and *n-transforms*, the influences of environmental processes on the archeological record, must be entered into consideration (LaMotta and Schiffer 2001; Schiffer 1975). The model that this paper proposes takes inspiration from behavioral archaeology in incorporating the consideration of distortions and function under the goal to analyse human behaviour. The consideration of distortions is beneficial to any bioarchaeological study because the depositional process of human remains (e.g. mortuary tradition), and post-depositional taphonomy (e.g. diagenesis), can both provide and obscure information about the life of an individual. This model will, however, take into account Binford's (1981) most logical critique that contemporary c-transforms are not distortions at all but rather evidence of behaviour. In this sense, the proposed model will consider cultural distortions as culturally independent disturbances, such as site reuse by non-contemporary people, modern disturbances, etc. It will consider environmental distortions much like behavioral archaeology in the consideration of taphonomic processes that can either obscure or mimic bioarchaeological data. These lenses will be applied to holistic interpretations made based on the interplay of the components of the study. This model will also go against the behavioral approach's belief that past human life can be conceptualized into laws. Contrarily, it rests on the contention that neither approach nor theory can stretch the full breadth of the archaeological record. This is where the integration of informed inferences comes into play.

It is crucial to emphasize the importance of an informed or "expert" opinion in both traditional and social sciences (Buckberry 2015). For example, in a study of the accuracy of standardized methods for age-at-death estimations compared to sheer non-methodological expert estimations, results placed the two

approaches on par (Milner and Boldsen 2014; Weise et al., 2009). If even one of the basic tenants of bioarchaeological research (age-at-death estimation) is so unreliable and increasingly inaccurate when uninformed by expertise and demographic information (Milner, Wood, and Boldsen 2008), then why are more new methods and theories not taking this into account? Although we cannot fabricate more physical or documentary evidence out of thin air, we can take multi-faceted approaches to best inform ourselves before making circuit-like interpretations. An informed opinion is twofold and must bridge the gap between archaeological expertise and Indigenous expertise. To decolonize practice, it is not sufficient to simply consider the role of descendent communities: their direction must be the stimulus of research (Rico 2017). In this model, projects are community-driven, ergo they are stimulated and shaped by the needs of descendants with active roles.

The suitability of a theoretical framework will, logically, be highest in the context in which it was developed. Theory is an important basis on which to make informed inferences; yet imposing generalized aspects of theory based on a temporally, culturally, and geographically distant population threatens the archaeologist's ability to make sound inferences (Perry 2018). Therefore, the proposed approach posits that not only a four-field approach be taken, such as in the biocultural model, but also a multi-theoretical one that is tailored to specific studies. It is ignorant to believe that either a processual or post-processual approach will encapsulate the entirety of information accessible through the archaeological record. This will help to narrow the precision and the accuracy of claims through better consultation of sources. Often one approach (processual or post-processual) is imposed on the other after interpretation. In this model they are considered together before interpretation. Incorporating Indigenous perspectives as legitimate aspects of the discourse before interpretation will help combat the time-old dichotomy of academic and subject, text and practice (Rico 2017). In this sense Indigenous voices are not being represented by the archaeologist (Rico 2017); rather they are representing themselves with the support of bioarchaeology as a tool to supplement their claims. This paper suggests that more informed inferences and interpretations can be made under the proposed model. The goal of such is to be solution-focused, straightforward, and logical for the sake of concise, meaningful research.

Components of Study

The initial step of the proposed framework is to narrow the intentions of the project. Figure 1 illustrates the four component groups that this model incorporates. To avoid generalizing research for research sake, this model aims to be employed in a community-driven manner, focusing on bioarchaeology as a tool to benefit the wants and needs of the community or to react to modern destructive events. This embodies the concept that, as stated by Köpe (1997), "a balanced and successful relationship in archaeological development is not realized through implementation of a firm concept. Every new situation needs its specific approaches and solutions" (157). This approach to community-driven research rejects the strictly scientific proceedings of theory and embraces a solution-focused approach. Moreover, depending on the temporal realm of the project, only certain resources may be available. The cultural protocols of descendent communities will also direct what sources of data will be drawn upon and the trajectory of the project. For example, if ceremony is required at certain steps of the project, they will be prioritized before any project component.

Within the four components of the proposed model, there is a separation between cultural systems and social determinants. This divide is based on critiques of the biocultural

and behavioral approaches. Cultural system components include group adaptations to external stresses while social determinants comprise the inner workings of cultural systems that pertain to the people's relations with each other and their culture responding to internal stimuli. These components are not strictly limited to traditional bioarchaeological evidence but are broadened to other aspects of archaeological theory applied in bioarchaeological or mortuary settings.

The biocultural approach, presented in the previous section, seeks to broaden research questions (Zuckerman and Martin 2016). The proposed model seeks to do the opposite, positing that a narrowing of research intentions or questions will result in more informed, community-practical, constructive inferences to be made in conjunction with existing knowledge or purpose. McNiven (2016) advocates that transcending theoretical divides creates the basis for a postcolonial discourse. Under narrowed research questions or purposes, larger-scale studies can also be addressed in terms of numerous small components compiling to form a bigger picture. These intentions will direct the project and how various components are weighted. For example, a project aimed to access or preserve cultural knowledge of a certain community would focus more on the social determinants and cultural system components, while a salvage excavation may focus more on recovering the information accessible from the physical evidence (such as the interaction between environmental context and skeletal remains). Intentions will also inform how alterations are interpreted, as will be discussed in the *Alterations* section. Moreover, the scope of study will be better informed for more specific research methods to be employed, avoiding unnecessary invasion or destruction. For example, if the intention of the study is to identify the limits of an unmarked cemetery, less invasive mapping and geophysical surveys will likely be sufficient. If the intention is to salvage a bulldozed cemetery, more extensive excavation and bioarchaeological analysis

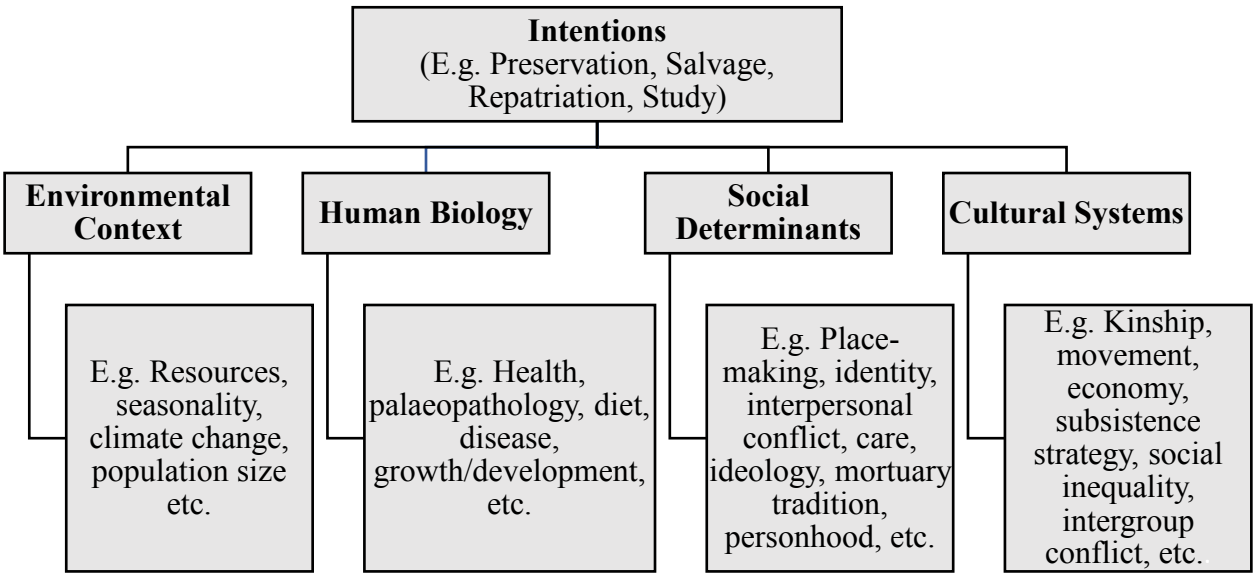

FIGURE 1—*Components of study.*

may be necessary. In this sense, the proposed model is not confined to strict bioarchaeological excavation, but rather it is employed as a mitigation strategy specific to bioarchaeological and mortuary sources. The consideration of intentions informs how an researcher interacts with bioarchaeological remains and influences how they analyze ancient behaviour. This requires a toolset of theoretical approaches, directed by collaboration.

Interpretive Relationships & Reciprocal Interpretations

Unlike the biocultural approach, the proposed model recognizes reciprocal relationships and multi-causative change. While the development of components introduces new pressures (social, environmental, cultural, and biological), this is done within an ongoing circuit instead of a strict feedback loop or cycle. The relationships that we see between components must be considered reciprocally when making interpretations. The inferences that inform these interpretations are based on focuses within the components and relay them onto each other without direction or order.

As illustrated in Figure 2, environmental context, such as resource dynamics, could cause cultural systems to adapt their subsistence patterns. These cultural adaptations, however, could impinge on the environment as well, such as population increase with the adoption of agriculture. Moreover, cultural systems influence, and are influenced by, other components of social determinants and biological needs. Following a unilinear pattern similar to the biocultural approach would neglect the reciprocal nature of multi-faceted influence, each influencing and being influenced by a circuit of component forces. Some of these forces work more quickly or gradually than others.

As with each step of the proposed process, this must be undertaken dynamically with the community with whom the researcher is working. A setting such as a round table discussion will allow all archaeological, oral, and traditional evidence to be interpreted within the purpose of the study and according to cultural protocols. Instead of imposing each of these onto each other, they are equally influential in the shared history or totality of the project. This is especially important in areas where science and traditional knowledge might not necessarily agree. In this reorientation of bioarchaeology, it is not the archaeologist who

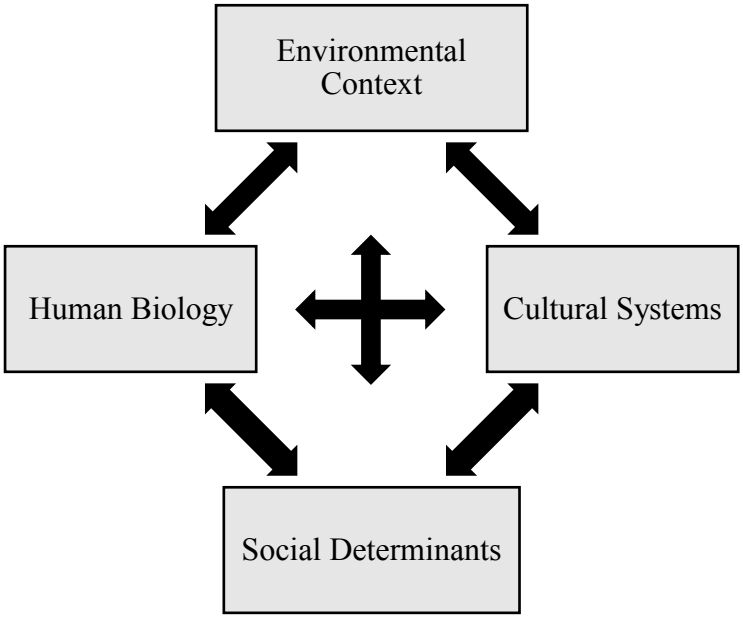

FIGURE 2—*Relationships between components of study.*

represents "fact," but rather the community who conceptualizes the study and voices its results in relevant, meaningful terms, this being the reason such work is being conducted in the first place.

Alterations

The consideration of the influential processes that have affected archaeological material between its deposition and the present is extremely important because no site is totally resistant to degradation processes (Binford 1981). Under behavioral archaeology, Schiffer (1975) describes c-transforms as "cultural processes responsible for forming the archaeological record" (839). Binford (1981) critiques this by inquiring into why cultural activity is seen as a distortion and not as viable archaeological evidence. Schiffer (1975) lends from the natural sciences and defines n-transforms in that they "describe the interaction between culturally deposited materials and environmental variables" (841). In Schiffer's seminal 1975 paper on behavioral archaeology, he notes that the c-transforms that he proposes are underdeveloped; therefore, unlike Schiffer's approach, my proposed model considers cultural distortions as alterations of the archaeological record by forces independent of the cultural scope of the study. It will consider environmental alterations, much like n-transforms in behavioral archaeology, as taphonomic processes that can either obscure or mimic bioarchaeological data. Figure 3 illustrates the interplay between environmental alterations, cultural alterations, and archaeological interpretations under the proposed model with the consideration that culture is one of the driving taphonomic factors (Lieverse, Weber, and Goriunova 2006) and that modern development is one of the largest threats to cultural heritage (Rainville 2009; UNESCO 2018).

Under this model, reuse by non-contemporaneous or temporally disparate populations would be considered an alteration if it does not apply to the scope of the project. Should it be incorporated within the scope, it would become a cultural system component. This is crucial in ontological studies, where interac-

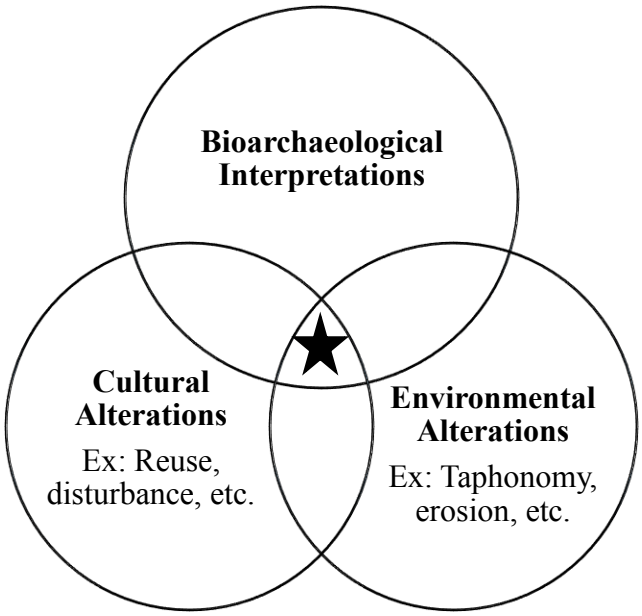

***FIGURE 3**—Incorporating distortions in the interpretation of archaeological remains. Considerations of what has happened between then and now. The starred area indicates the optimal situation of interpretations (although intentions may shift this).*

tions between the living and the dead continually reinforce and reform identity (Johnson 2016). Modern disturbances by way of development would qualify as a cultural disturbance while secondary burial would not and instead be part of social determinant and cultural system components. Of course, project specifics may weigh either environmental or cultural distortions more or less heavily based on the circumstances and condition of the remains.

CONCLUSION

The shortcomings in the field of bioarchaeology that this model seeks to address under the era of reconciliation in Canada today are very much a reflection of the institution within which research is conducted that often does not foster non-scientific evidence-based research. Large-scale change is gradual, which is why we must constantly look to decolonize our own work and integrate social theory and traditional knowledge. Based on critiques of the biocultural model and behavioral archaeology, the proposed mode that this paper proposes seeks to develop a new way to structure bioarchaeological research to create informed inferences from a wide breadth of sources in a hope to decolonize the practice in lines with Harrison's (2014) Shared Histories.

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REVIEW ARTICLE

Skeletal Dysplasia: an Analysis of Dwarfism in Ancient Egyptian Culture

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ABSTRACT
The purpose of this paper is to analyze dwarfism and its standing in ancient Egyptian society and culture. Dwarfism existed in ancient Egyptian society, but unlike other ancient societies, those with dwarfism were not blatantly discriminated against (Sullivan 2001). Individuals with dwarfism could hold many positions within society ranging from herdsmen and fishermen, to personal attendants in royal court (Kozma 2008). There is evidence of individuals with dwarfism dating back to the Badarian Period, with statues, sarcophagi, skeletons, and paintings all having been discovered (Kozma 2008). There are several prominent figures who have been studied in detail; Per-ni-ankh-w was an individual with high status in Egyptian society, and there is ample documentation of him in texts, visual imagery, and skeletal evidence (Kozma 2008). Djeho was another individual who has been well documented and aided with burials (Kozma 2008). Individuals with dwarfism also had religious importance, including the gods Bes and Ptah (Kozma 2008). Individuals with dwarfism were also considered to hold magical significance, and this was seen in spells and religious texts (Kozma 2008). Additionally, there is an abundance of artistic representation of individuals with dwarfism, in the form of statues, sarcophagi, and visual images (Kozma 2008). The Walters Art Museum is also a significant holder of Egyptian art, with many depictions of dwarfism (Kozma 2010). These individuals were significant in ancient Egyptian society and were well documented in several forms.

Keywords: skeletal dysplasia, dwarfism, achondroplasia, hypochondroplasia, osteology, iconography, Walters Art Museum

INTRODUCTION

Skeletal Dysplasia in modern society is often considered taboo, or enigmatic, and individuals afflicted with the condition are regularly subjected to scrutiny and objectification; however, in ancient Egyptian society, individuals with skeletal dysplasia existed harmoniously with the rest of the population. In this region those affected with skeletal dysplasia, more commonly known as dwarfism, were not regarded with disdain or distaste, which was common in other ancient societies such as Greece or Rome (Sullivan 2001, 262–6). Instead, individuals with dwarfism were viewed positively in ancient Egyptian culture and were often depicted with youthful qualities and frequently associated with certain deities such as Bes, Ptah, and Horus (Sullivan 2001, 262). This paper will begin with medical terminology and an overview of skeletal

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dysplasia, followed by a brief history of study, and osteological explanation of skeletal dysplasia. Next, the depiction of individuals with dwarfism will be explored, followed by a discussion of collections of ancient Egyptian art, and examinations of where the art was first uncovered. The social status of known individuals with skeletal dysplasia such as Per-ni-ankh-w and Djeho will then be examined. Buried with these individuals was an abundance of evidence in the forms of statues, tomb paintings, and coffin texts that attest to their social status and duties. Following this, the religious and magical importance of people with dwarfism will be discussed. Figures, amulets, and papyri of magical significance have been found, and several gods are depicted with dwarfism (Kozma 2008, 3104–3112). Artistic evidence of people with dwarfism will then be examined. There is an abundance of artistic representations from many different sites showcasing the different types of skeletal dysplasia, which give insight into the life and position of the individual depicted. This paper will discuss how persons with skeletal dysplasia in ancient Egypt could gain considerable status within society and were positively represented in artistic, religious, and magical contexts.

MEDICAL TERMINOLOGY

Skeletal dysplasia is an all-encompassing term for those affected by dwarfism, and it includes conditions such as achondroplasia, hypochondroplasia, and osteogenesis imperfecta, (Dasen 1988, 255). There are over four hundred different types of skeletal dysplasia, but the condition itself is quite rare (Calder and Foley 2018, 84–92). Most disorders are inherited genetically. The genetic mutation causing skeletal dysplasia alters genes involved in the development process of the entire skeleton, and there are 364 known genes involved (Calder and Foley 2018, 84). The most common type of dwarfism is achondroplasia, which can sometimes be referred to as short-limbed dwarfism (Calder and Foley 2018, 84). The disorder results from a gene mutation and is an autosomal dominant trait, meaning it can be passed on to offspring; however, most cases are the result of a new mutation (Calder and Foley 2018, 88). The disorder causes slowed longitudinal growth of the long bones, and early closure of the joints of the axial skeleton (Calder and Foley 2018, 88). This results in individuals having short limbs, a large cranial vault, small facial bones, and a normal trunk (Dasen 1988, 255). Hypochondroplasia is just as common as achondroplasia but is a milder form of dwarfism (Dasen 1988, 255). Like achondroplasia, hypochondroplasia is usually caused by new gene mutations but can also be passed on genetically (Glasgow, Nevin, and Thomas 1978, 871). Individuals affected by hypochondroplasia have short limbs and lumbar lordosis, an inward curve of the lower spine; however, the extreme short stature and the small facial bones that are seen in achondroplasia are not present in those with hypochondroplasia (Glasgow, Nevin, and Thomas 1978, 871). Osteogenesis imperfecta also has an autosomal dominant inheritance pattern, but like achondroplasia and hypochondroplasia, most new cases are caused by mutation, specifically in the genes that code for collagen (Calder and Foley 2018, 87). The distinct characteristics of this conditions are a blue sclera of the eye, discoloured teeth, hypermobility of the skin and joints, hearing impairments, and brittle bones (Rauch and Glorieux 2004, 1377). Additionally, there are at least 19 different types of the condition which range in severity (Rauch and Glorieux 2004, 1377). Most skeletal evidence of dwarfism consists of individuals with achondroplasia, and the condition is most easily identified by examining the spine, long bones, and skull (Dasen 1993, 14).

HISTORY OF STUDY

In ancient Egypt there is a long history of individuals afflicted with skeletal dysplasia, with skeletons dating back as early as the

Badarian Period, 4400–4000 BCE (Kozma 2008, 3105). Individuals with dwarfism in ancient Egypt have been studied by many well-known archaeologists. For example, John Garstang excavated at Beni Hasan, and Auguste Mariette found the tomb of Khnum-hotep at Saqqara (Dawson 1938, 186). James Quibell also uncovered the tomb of Djeho, which contained his unique sarcophagus (Dawson 1938, 186). These excavations brought to light several examples of notable individuals of dwarfism. Since archaeologists began examining people with dwarfism, the field has advanced alongside regular archaeological excavation. Techniques now include advanced medical analyses that help archaeologists examine the bones and diagnose rarer, more specific forms of skeletal dysplasia (Kozma 2008, 3106).

OSTEOLOGY

Osteology is the scientific study of bones, which is critical for discovering skeletal dysplasia in any individual. There is skeletal evidence of dwarfism from as early as the Badarian Period (Kozma 2008, 3105–106). The Badarian Period lasted from approximately 4400–4000 BCE, and during this time the first early farming culture with standardized organization was developed (Shaw and Ian 2003, 39). The Badarian Culture resided in Upper Egypt, and had a well-established practice of fishing, agriculture, and animal husbandry (Shaw, and Ian 2003, 39). In addition to this, hundreds of graves with thousands of remains have been discovered from this period, including skeletons with skeletal dysplasia (Dawson 1938; Kozma 2008; Shaw, and Ian 2003). Analysis of the Badarian skeleton in Figure 1 shows that the individual had skeletal dysplasia. While their skull was of a normal size, their humerii, radii, and ulnae were all smaller than normal (Kozma 2008, 3105–106). These characteristics are suggestive of short-limbed dwarfism, but the exact

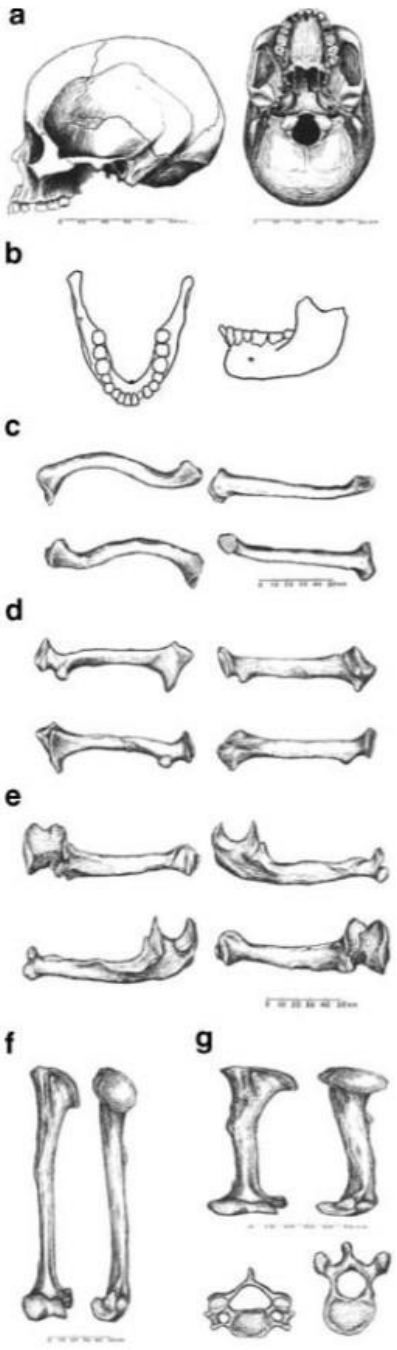

FIGURE 1—*A drawing of a skeleton from the Badarian Period, illustrating the skeletal markers of dwarfism. (**a**) Skull, (**b**) mandibles, (**c**) clavicles, (**d**) radii, (**e**) ulnae, (**f**) humeri, (**g**) vertebrae (Kozma 2008). Reproduced with permission from the American Journal of Medical Genetics Part A, John Wiley & Sons.*

condition has been disputed (Kozma 2008, 3105–106).

Other skeletons dating to predynastic times, approximately 4000–3000 BCE, were found at Hierakonpolis, and Beni Hasan (Dawson 1938, 186). Both Hierakonpolis and Beni Hasan were located in Upper Egypt, what is now the southern part of modern Egypt. The tomb complex of King Wadj contained a skeleton dating to between 3100–2800 BCE. This skeleton was found to have had extremely short limbs, which is suggestive of achondroplasia (Kozma 2008, 3106). At the site of Abydos, in Upper Egypt, the skeletons of three individuals with dwarfism, as well as the humerus of another, have all been found, and all appear to have signs of achondroplasia (Dawson 1938, 186). The tombs of Khnumhotep and Djeho were uncovered at Saqqara, and the tomb of Seneb was located at Giza (Dawson 1938, 187). The sites of both Saqqara and Giza were located in Lower Egypt, currently the northern part of modern Egypt. Both Khnumhotep and Seneb were high officials in court, and each tomb contained statues, sculptures, sarcophagi, or skeletal evidence indicating the presence of dwarfism (Dawson 1938, 186–87). Per-ni-ankh-w, an elite member of society, was very well documented through artistic renditions and had an intact tomb complete with his skeleton, which allowed for the study of his bones. The skeleton showed the trademark signs of achondroplasia (Kozma 2008, 3106). These individuals, along with the nameless skeletons, are just a few of the many examples of dwarfism in ancient Egypt, showcasing when and where these people existed.

ARTISTIC REPRESENTATION

Sites

There are countless artistic representations of individuals with dwarfism from ancient Egypt, ranging from regular people to gods. There is artistic evidence from as early as predynastic Egypt (prior to 3100 BCE), up until the Greco–Roman Period (332 BCE–395 AD; Kozma 2010, 2556). The sites of Naqada and Ballas, both in Upper Egypt, contained small ivory figurines of individuals with dwarfism, showing that people with dwarfism were being commemorated as early as predynastic times (Dasen 1988, 260). At Abydos, nine stelae were found dedicated to individuals of the court who suffered from dwarfism (Dasen 1988, 260). This is noteworthy as it shows that those with dwarfism could achieve status in the royal court and even receive commemoration. In the tomb of Mereruka, there is a depiction of four bald people with dwarfism making necklaces (Dasen 1988, 260). The baldness is of note because it was a typical characteristic of herdsmen or fishermen, which indicates that dwarfs could be both ordinary and elite members of society (Dasen 1988, 260). However, the fact that they were depicted in a tomb is of significance, as they would have been of some importance within society. In addition to statues of gods, renditions of ordinary people with dwarfism were often found in tombs at Saqqara and Giza, usually performing ordinary tasks such as herding and fishing (Kozma 2008, 3110). The Walters Art Museum has a collection of such statues; these statues depict the individuals participating in a range of activities, such as dancing, working (Figure 2), or entertaining. Many are shown with harmful animals, such as crocodiles, which highlights their protective role, similar to Figure 6 of the god Ptah (Kozma 2010, 2560). The act of placing statues of common people with dwarfism in tombs is a testament to the ritualistic importance of individuals with dwarfism as they were deemed necessary to accompany the deceased to the afterlife. Sarcophagi inscriptions, such as on Djeho's sarcophagus, detail the lives of the individual and their place in society. Figures and amulets are also prevalent, especially regarding religious or magical importance.

Artistic Depiction

The physical representation of dwarfism is mostly standard throughout ancient Egypt. The overall features of dwarfism are well displayed —large head, long trunk, and short, often bowed limbs (Dasen 1988, 267). Finer details are also occasionally added, including a rounded forehead, large thighs, and tilted (Dasen 1988, 267). However, the three features that are standard to artistic representations in ancient Egypt are not always accurate

FIGURE 2—*An image of a statue of an ordinary dwarf, found at the Walters Art Museum (Kozma 2010). Reproduced with permission from the American Journal of Medical Genetics Part A, John Wiley & Sons.*

pelvis but have an important meaning. First, in nearly all depictions, people with dwarfism are displayed with normal faces which suggests a respect for the individual's legacy (Dasen 1988, 267). Secondly, short stature is also exaggerated, suggesting that their height was of importance to the elite who employed them. Lastly, a flat skull was used to stress the religious importance of dwarfs, which which symbolized the reverence for Ptah, who was often depicted with a flat skull (Dasen 1988, 268).

KNOWN INDIVIDUALS

Per-Ni-Ankh-W

In ancient Egypt, people with dwarfism fulfilled many different roles and duties, often consisting of important positions within the court. These roles included taking care of jewellery and pets, or acting as personal attendants (Dawson 1938, 187). There are

FIGURE 3—*An image of the statue of Per-ni-ankh-w, which was discovered in his tomb (Kozma 2008). Reproduced with permission from the American Journal of Medical Genetics Part A, John Wiley & Sons.*

textual, and osteological evidenceseveral well-known individuals who achieved higher status and are well represented in iconographic.

The Old Kingdom, lasting from 2700–2190 BCE, was home to Per-ni-ankh-w. The Old Kingdom was a peaceful and prosperous time, marked by the building of the pyramids,

including the Great Pyramid of Giza. Per-ni-ankh-w was court official in the fifth or sixth Dynasty, the later part of the Old Kingdom (Kozma et al. 2011, 1817–1824). This man was a well-documented individual, allowing for archaeologists to uncover several details regarding his life. Both sides of his chair, shown in Figure 3, bear the inscription "the dancing dwarf in the Great Palace, the one who pleased his majesty everyday, Per-ni-ankh-w," indicating he was close to the king (Kozma 2005, 307). This is noteworthy as it shows that someone affected by dwarfism could ascend to a place in society where their relationship with the king was of enough consequence to be inscribed on their statue. Per-ni-ankh-w is important for aiding in the understanding of skeletal dysplasia in ancient Egypt because he has biological, artistic, and textual evidence detailing his life. The fact that he was important enough to receive a tomb rather than a common grave is also a distinct indicator of status. In Figure 3, Per-ni-ankh-w's dwarfism is apparent in the short upper and lower limbs, as well as the short neck (Kozma 2008, 3107).

Djeho

Another well-known individual with dwarfism is Djeho, who was buried at Saqqara around the year 345 BCE with his patron Tjaiharpta (Baines 1992, 241–257). Tjaiharpta was the highest ranking financial official in the country, holding the title of *sntj*; in contrast, Djeho held no high title but was associated with the Cult of the Bulls (Baines 1992, 250). According to Baines (1992), "Djeho was specially qualified by his physical abnormality to perform the cult dances, and so had a privileged role in the burials of the sacred bull" (255). The relationship between Djeho and Tjaiharpta is quite interesting. They were buried together and had inscriptions on their respective sarcophagi that referred to each other. In addition to this, on Djeho's sarcophagus, there is a full-length profile portrait of himself, seen in Figure 4.

FIGURE 4—*An image of Djeho's sarcophagus (Kozma 2005). Reproduced with permission from the American Journal of Medical Genetics Part A, John Wiley & Sons.*

His dwarfism is clearly pronounced in this depiction, highlighted by the short limbs, tilted pelvis, and squat stature. Djeho's sarcophagus also has messages asking for Tjaiharpta to have a good life and easy passage to the afterlife (Baines 1992, 250). Normally in ancient Egypt, a sarcophagus would contain purely religious texts, and in this case, it appears as if the figure was added after the original inscription (Baines 1992, 249). These unique sarcophagi inscriptions are interesting because they defy the normal ancient Egyptian funerary traditions and indicate that both individuals had a high enough status within society to have

these sarcophagi made. Their burial place of Saqqara is also notable because the necropolis was used extensively by pharaohs in the Old Kingdom (Shaw and Ian 2003, 70). To be buried here, the deceased must have been of high status or importance within ancient Egyptian society.

RELIGIOUS AND MAGICAL IMPORTANCE

Bes

Bes and Ptah, two Gods with dwarfism, played important roles in the protection of both the living and the dead (Kozma 2008, 3109). Bes, god of music and warfare, is a protector of the household and is depicted with dwarfism (Kozma 2008, 3109). His most important role was the protection of women during childbirth. So important was this role that there is a specific papyrus and spell associated with him. The magical papyrus at Leiden contains a "Spell of the Dwarf," which helps facilitate childbirth (Kozma 2008, 3109). The directions of the spell say to recite the following words: "O good dwarf, come, because of the one who sent you . . . come down placenta, come down placenta, come down," four times over a statue of Bes (Figure 5) that has been placed on the woman, which will ensure safe delivery of the child (Kozma 2008, 3109; Dawson 1938, 188).

FIGURE 5—*An image of the statue of the god Bes (Kozma, 2008). Reproduced with permission from the American Journal of Medical Genetics Part A, John Wiley & Sons.*

Ptah

Ptah, another god with dwarfism, is the creator of the universe, god of craftsmen, and patron god of Memphis (Kozma 2008, 3110). The god Ptah is only sometimes depicted with dwarfism and is often seen with a scarab beetle on top of his flattened skull (Dasen 1988, 268). Ptah played an important protective role, frequently being shown holding snakes or standing on crocodiles, such as in Figure 6, to represent his defensive role towards harmful creatures (Kozma 2008 3109–10). When depicted as a dwarf, Ptah is very distinct from

FIGURE 6—*An image of the statue of the god Ptah standing on crocodiles and holding a knife in each hand (Kozma 2010). Reproduced with permission from the American Journal of Medical Genetics Part A, John Wiley & Sons.*

Bes; in comparing Figure 6 to Figure 5, the difference in stature is very apparent. Bes is depicted in a squatting posture, whereas Ptah has a longer trunk. They both have short limbs, but Ptah is also depicted naked. The apparent dwarfism of these two gods shows that the ancient Egyptian people held those with skeletal dysplasia in high regard within their society. Additionally, it also demonstrates that individuals with dwarfism are viewed as important members of ancient Egyptian culture.

Magical Significance

People with dwarfism also had religious and magical significance outside the form of gods. Besides the magical papyrus at Leiden, another magical papyrus also has an individual with dwarfism mentioned in the spell: "O thou dwarf of heaven! O Thou dwarf of heaven! Thou dwarf whose face is big, whose back is long and whose legs are short" (Dawson 1938, 188). The mention of a dwarf of heaven is important as it illustrates the magical meaning of people with dwarfism, and further highlights that they could achieve high status within society and religion. In the 147th and 164th spell in the *Book of the Dead*, pictures of individuals with achondroplasia are shown, which demonstrates their magical importance in ensuring safe passage to the afterlife (Dawson 1938, 188). There are also very early depictions of people with dwarfism in the form of figurines and amulets, and they are seen in funerary papyri much later (Dawson 1938, 188). The abundant representation of individuals with dwarfism in religious texts and spells, as well as two gods with dwarfism, showcases the religious and magical importance that dwarfs held within Egyptian society.

CONCLUSION

In ancient Egypt, skeletal dysplasia is abundantly represented. Examination of the artifacts and skeletal remains that display evidence of dwarfism is important because it allows for the intricacies of social acceptance in ancient Egyptian culture to be more thoroughly understsood. There are many examples of individuals who gained rank within the court, such as Per-ni-ankh-w and Djeho, and their role within society and importance to the King is well documented. The gods Bes and Ptah are very well known, and both play important roles in the protection and creation of the ancient Egyptian people. Various spells, papyri, amulets, and sarcophagi inscriptions also demonstrate the magical importance of people with dwarfism and their role in the afterlife. The abundance of iconographic representations of individuals with dwarfism ranging from the Predynastic Period to the Greco-Roman Period helps document these indvidiuals throughout the history of ancient Egypt and shows their changing roles in society. These representations also showcase that individuals with dwarfism were permitted to lead normal lives, free from discrimination that was abundant in other ancient societies, and could rise above their station to lead important roles within the court. Based on these observations, it is clear that people with dwarfism were important and respected members of ancient Egyptian civilisation, with roles in every aspect of society from herdsmen, to officials in the royal court, to gods.

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REVIEW ARTICLE

New and Emerging Prospects for the Paleopathological Study of Starvation: A Critical Review

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ABSTRACT
Starvation represents a significant contributor to morbidity and mortality, past and present, and is therefore of critical importance to the field of paleopathology. Scholars have previously argued that while critical to understanding past human health, starvation is often not directly observable in skeletal remains. But is this assessment still valid today? In re-evaluating this assessment, this paper discusses new developments in the analysis of (1) the "hunger osteopathies" (osteoporosis with some overlay of osteomalacia), (2) skeletal signs of arrested growth such as Harris lines and Linear Enamel Hypoplasia (LEH), and (3) carbon and nitrogen stable isotope analysis of skeletal remains. Periods of starvation are known to cause these visible and chemical alterations within skeletal remains, but these phenomena are complex, multi-etiological, and approaches to evaluate them are often fraught with a lack of standardization and specificity. An interdisciplinary approach synthesizing multiple lines of osteological and dental evidence, borrowing anatomical and medical research, and implementing new advancements in computer modeling, imaging modalities, and chemical micro-sampling may theoretically aid in inferring starvation bioarchaeologically.

Keywords: bioarchaeology, paleopathology, osteoporosis, osteomalacia, Harris lines, linear enamel hypoplasia, stable isotopes

INTRODUCTION

Starvation is a key contributor to mortality and morbidity, past and present. Due to the significance of starvation to human health in past populations and the breadth to which starvation impacts the skeleton, it is a topic of utmost importance in paleopathology and the subject of much discussion. According to some scholars, however, the prospects of diagnosing starvation bioarchaeologically are extremely bleak. In a review of approaches to interpreting famine, Johanna Morgan (2013) argued that in the absence of documentary data, it is impossible to interpret famine bioarchaeologically. This leads to the following question: in the constantly changing and evolving discipline of paleopathology, is this assessment still valid? Numerous methodological advancements in paleopathology have been published since 2013. This review paper will discuss and analyze three common approaches to studying starvation from skeletal remains and assess whether these new advancements in paleopathology and bioarchaeology have the potential to challenge Morgan's (2013) hypothesis.

In this paper, I will first introduce the topic of starvation and discuss some widespread theoretical considerations and constraints, such as the osteological paradox, which limit the paleopathologist's ability to directly observe many pathological conditions on skeletal remains. Next, I will discuss three common approaches to the bioarchaeological study of starvation (the "hunger osteopathies,"

signs of arrested growth, and stable isotopic analysis), focusing particularly on the problems of these approaches and any new and emergent techniques which may refine them.

It should be noted that definitions of starvation vary widely across the literature, even within the fields of bioarchaeology and paleopathology (Horocholyn and Brickley 2017). Within the context of this paper, starvation will refer specifically to severe protein-calorie malnutrition, in which the energy the body expends is more than the energy it takes in, resulting in severe wasting and general undernutrition (Waterlow 1972). This definition contains a suite of various starvation states, including marasmus (generalized starvation and wasting, characterized by an emaciated appearance) or kwashiorkor (caused by a pronounced lack of protein in the diet and characterized by an abdominal edema; Waterlow 1972).

BACKGROUND

Starvation, or severe undernutrition, is a pervasive health issue for humans both past and present. Today, an estimated 52 million children under the age of 5 years are considered starved to the point of "wasted" (severely low weight-for-height; WHO 2018). As Webb and colleagues (2018) put it, ironically, "today's world is characterized by the coexistence of agricultural bounty and widespread hunger and malnutrition" (1).

Individual contexts such as medical conditions such as digestive disorders like Crohn's Disease, ulcerative colitis, celiac disease, and irritable bowel syndrome (IBS), cancers, and mental illnesses such as eating disorders (anorexia nervosa and bulimia) or depression, and abusive or negligent circumstances can result in starvation (Kastin and Buchman 2002; Mattar et al. 2011; Piercecchi-Marti et al. 2006; Santarpia, Contaldo, and Pasanisi 2011; Smoliner et al. 2009). On a more social or populational level, widespread causes for starvation include famine (extreme food scarcity), natural disaster, social conflict, warfare, and poverty (Kufour 1994; Sen 1981).

While clearly a vastly important issue in global health today, the existence of starvation is also an important topic for paleopathology, which is defined as the study of disease in the past primarily undertaken through analysis of skeletal remains. The prevalence of starvation likely saw a vast increase following the intensive adoption of agriculture by humans (Berbesque et al. 2014), and it has remained a significant and recurrent mortality crisis for past human societies (Watkins and Menken 1985). Starvation represents an important etiological factor behind numerous pathological conditions that can be observed in the skeletal system. For example, periods of starvation can result in elevated secondary bone loss, cause micronutrient (e.g. vitamin C, vitamin D, calcium, iron, niacin) deficiencies which may manifest skeletally, or cause arrests in skeletal and dental growth (Brickley and Ives 2008; Roberts and Manchester 2005). Additionally, starved individuals are often more susceptible to other insults, such as infectious disease, as starvation can cause immunodeficiency (Gowland 2015, 532; Katona and Katona-Apte 2008; Taylor et al. 2013).

Bone is a tough yet elastic tissue consisting of collagen fibrils and hydroxyapatite mineral, acting as a supportive framework for the body and a reservoir for minerals and nutrients. A dynamic tissue, bone constantly undergoes remodelling, the coupled process by which units called osteoclasts resorb (or remove) bone and units called osteoblasts form new secondary osteons (cylindrical structures constituting the fundamental structural unit of bone) in the resorption spaces (Cooper et al. 2006; Hadjidakis and Androulakis 2006). Both deciduous and permanent teeth consist of a tooth crown and root comprised of the following three distinct tissues: dentine, enamel, and cementum. Beginning in utero, these tissues develop incrementally, with enamel and primary dentine formation ceasing during

childhood, and secondary dentine and cementum continuing to form into adulthood (Bodecker 1925; Grue and Jensen 1979; Lacruz et al. 2017). Stressors or disruptions upon the typical development and dynamics of bone and teeth can result in mascroscopic, microscopic, and chemical irregularities that can be detected by the paleopathologist to make inferences about individual and populational health.

While a critical etiological factor to the field of paleopathology, the skeletal detection of starvation can be challenging and contains many limitations, forming the basis of Morgan's (2013) argument that starvation could not be inferred archaeologically. Many of paleopathology's limitations in this regard are derived from the nature of the skeletal system itself. In 1992, Wood and colleagues introduced the osteological paradox, shedding light on several theoretical issues in paleopathology. They argued that populations within the bioarchaeological record exhibit a hidden heterogeneity of risk and selective mortality, meaning that individuals vary in their susceptibility to illness, and that assessing population health based on the presence or absence of skeletal lesions presents a distorted view of past human mortality and survival. Are skeletal indicators of possible starvation present only because an individual survived the period of physiological stress long enough to develop them? Did starvation directly kill an individual, or did it increase an individual's frailty and susceptibility to other diseases, such as infection? These are important theoretical considerations in paleopathological studies of starvation.

Additionally, there are a finite number of ways that the skeleton can react to disease (Ortner 2009); often times, bony manifestations of disease will not be diagnostic of a condition and rather involve a suite of lytic or sclerotic changes with much overlap in appearance and description. On a similar note, paleopathological conditions linked to starvation often have multiple underlying etiologies, beyond starvation. For example, osteoporosis may be related to age or hormonal changes or develop secondary to nutritional stress, trauma, or infection (Brickley and Ives 2008, 151).

The paleopathological interpretation of starvation is not just limited by the nature of the skeleton itself; there are several limitations inherent in the discipline of paleopathology that have stalled its progress. Zuckerman, Harper, and Armelagos (2016) have argued that the discipline of paleopathology has been hindered by its resistance to draw from or misuse of advancements in other scientific disciplines. Additionally, the assessment of skeletal pathological conditions is impacted by numerous methodological limitations including inter- and intra-observer error, a lack of standardization in methods, and limitations within specific techniques themselves.

The following sub-sections will critically assess three different categories of bioarchaeological approaches to studying starvation and discuss whether these approaches support or refute Morgan's (2013) argument in light of new and emerging techniques. It should be noted that it is unlikely that any of these approaches, when used alone, could ever be sufficient enough evidence to indicate periods of starvation within an individual's life. The assumption here is that multiple lines of osteological evidence would always be used in inferring starvation bioarchaeologically as this allows for a greater confidence of properly diagnosing a condition osteologically.

PALEOPATHOLOGICAL APPROACHES TO DETECTING STARVATION

"Hunger Osteopathies": Osteoporosis and Osteomalacia

According to Ortner (2003, 405), starvation results in "hunger osteopathies"—defined as secondary osteoporosis with some overlay

of osteomalacia. Osteoporosis and its precursor condition, osteopenia, are typically characterized by a decrease in bone density and a decline of bone microstructure, often correlated with increasing age or postmenopausal hormone changes (Gregg et al. 1997; Lindsay and Tohme 1990; Vidal et al. 2019). These skeletal changes are related to a shift in remodelling dynamics toward net bone loss, caused by a decrease in bone formation, an increase in bone resorption, or both (Seeman 2003, S3; Donovan et al. 2005). This imbalance of bone remodelling often leads to increased susceptibility for bone fracture, contributing to increased morbidity and mortality (Dempster 2011). Secondary osteopenia and osteoporosis differ from age-related or postmenopausal osteopenia and osteoporosis as they are caused by trauma, nutritional insufficiency, or diseases such as hyperthyroidism, hyperparathyroidism, hypogonadism, idiopathic hypercalciuria, or Cushing's syndrome and occur independent of the aging process (Brickley and Ives 2008, 185; Hudec and Camacho 2013). Several metabolic changes during starvation result in secondary osteoporosis. Reductions in dietary protein leads to a decline in calcium absorption as well as secondary hyperparathyroidism, which facilitates an increase in the rate of bone remodeling (Rizzoli and Bonjour 2004). Additionally, starvation results in estrogen deficiency, thereby causing an increase in osteoclastogenesis (the process of bone resorption), and consequently, an increase in bone loss (D'Amelio et al. 2008; Grinspoon et al. 1999; Rigotti et al. 1984).

Osteomalacia is a pathological condition caused by vitamin D deficiency, resulting in insufficient bone mineralization. This condition is characterized by buckled vertebrae, teeth deformations, antemortem tooth loss, cranial porosity, and deformations or bending to the ribs, sternum, pelvis, sacrum, and long bones (Brickley and Ives 2008, 127–131). However, linear pseudofractures (small, linear fractures which heal poorly) are the hallmark of this condition (Brickley and Ives 2008, 118). Clinically, deficiencies in vitamin D and calcium have also been linked to secondary hyperparathyroidism (Agarwal, Gupta, and Sukumar 2009; Lips 2001), which can cause bone loss, though specific mechanisms of cause and effect are not yet completely understood.

Ortner's "hunger osteopathies" were defined following observations of individuals who experienced starvation during the world wars (e.g. Dalydell and Chick 1921; Maratka 1946). In addition, post-war clinical studies have also repeatedly observed links between anorexia nervosa, osteopenia or osteoporosis, and osteomalacia (e.g. Herzog et al. 1993; Oliveri, Gomez Acotto, and Mautalen 1999; Rigotti et al. 1984; Soyka et al. 1999; Verbruggen, Bruyland, and Shahabpour 1993). The skeletal manifestations of the "hunger osteopathies" can develop later in life, as evidenced by longitudinal studies of child survivors of the Holocaust who went on to develop osteoporosis prematurely (Weisz and Albury 2013). This may be due to the "Barker hypothesis," which proposes that nutritional stress in early childhood or in utero can ultimately "program" an individual's physiology, creating long-lasting repercussions on development and health (Calkins and Devaskar 2011; Gowland 2015).

A thorough compilation of the academic literature surrounding these topics have demonstrated an association between starvation and osteoporosis. But is there any utility in using the "hunger osteopathies" for diagnosing starvation? At first glance, it would seem not, as both osteoporosis and osteomalacia have numerous etiological and risk factors besides starvation (e.g. age, sex, genetics, sunlight exposure, disease). The presence of these pathological conditions does not immediately constitute period(s) of starvation in an individual's life. However, Ortner (2003, 405) argues that a diagnosis of starvation is possible if the "hunger osteopathies" are predominantly

found in the spine and occur in younger individuals. These factors allow for the ability to differentiate between osteoporosis and osteomalacia as secondary to starvation, as opposed to other causative factors, such as aging.

Additionally, the opportunity to observe the "hunger osteopathies" may be limited in bioarchaeological contexts as both osteoporosis and osteomalacia do not preserve well. The decrease in the inorganic component of bone associated with both conditions make it more susceptible to taphonomic and diagenetic degradation, the physical, chemical, and biological processes by which skeletal remains have been altered in the burial environment (Baker 1978, 108; Bartosiewicz 2008, 73). On a similar note, osteoporotic bone could be mistaken for taphonomically or diagenetically altered bone (Bartosiewicz 2008, 73). The non-diagnostic nature of osteoporosis and osteomalacia as well as the preservation bias of these conditions limit their application in inferring starvation from skeletal remains.

While these two limitations of complex etiologies and taphonomy to the study of "hunger osteopathies" are unlikely to change, advancements both in age-estimation techniques and in other bone biology fields may improve paleopathology's ability to study osteoporosis and osteomalacia in starvation contexts. According to Ortner, diagnosing osteoporosis and osteomalacia as secondary "hunger osteopathies" becomes more of a possibility if the individuals are younger adults, as age-related changes can be ruled out. However, this is challenging as many skeletal age-estimation techniques have large error rates that require individuals to be placed into wide age categories. Recently there have been developments in skeletal age-estimation techniques that focus on the correlation between age and changes in bone mineral density, degenerative disease, histology, dental pulp changes, and molecular markers (Ubelaker, and Khosrowshahi 2019) that could refine the estimated ages of skeletal remains. Advancements in these techniques allow for more accurate assessments of whether osteoporosis is primary (age-related) or secondary in nature.

As discussed above, Zuckerman, Harper, and Armelagos (2016) argued that the advancement of the discipline of paleopathology has been historically hindered by its unwillingness to adopt scientific knowledge from other disciplines. However, recent paleopathological literature pertaining to osteoporosis and osteomalacia tells a different narrative, borrowing from skeletal anatomy and clinical studies to advance the discipline's knowledge of these two pathological conditions. For example, in a pilot study, Robertson and colleagues (2018) used a rodent model to examine the interplay between starvation and bone loss with the aim of extending their results to the archaeological record. Using micro-computed tomography (micro-CT), they mathematically and visually tracked changes in bone microarchitecture, observing marked loss in both trabecular integrity and number, and analyzed the corresponding isotopic changes in response to starvation. This study is one such example of an adoption of methods and practices common in other disciplines (e.g. controlled animal models, micro-CT) to advance the paleopathological study of starvation. Further research using animal models and high-resolution microstructural imaging modalities may lead to additional insights in starvation-specific bone microstructural changes or in differentiating taphonomic from osteoporotic changes, which will be useful in the study of the "hunger osteopathies." This study is promising, showing paleopathology's willingness to adopt procedures and knowledge from other disciplines. It represents one example of the new and emerging techniques in paleopathology which can potentially challenge Morgan's (2013) argument that starvation is invisible bioarchaeologically.

Starvation and Development: Signs of Arrested Growth

Starvation, when experienced during an individual's development, can have potent impacts on skeletal growth, as the body no longer has enough energy to expend on growth processes. Consequently, non-specific indicators of stress, particularly those linked to arrested growth, are often used in bioarchaeological contexts to infer periods of stress, such as starvation, from an individual's life. Such indicators include Harris lines of arrested growth or linear enamel hypoplasia (LEH). Mays (1995) argues that dental development is less susceptible to periods of stress than bone; therefore, inconsequential or short-term stress events may result in the formation of Harris lines but not LEH. On the other hand, bones remodel while teeth do not; therefore, childhood Harris lines resorb over time and are replaced with new bone, whereas LEH is a permanent record of physiological stress during development (Grolleau-Raoux et al. 1997). Assessing the presence or absence of each type of these particular stress indicators is therefore potentially useful in inferring the nature or severity of a stress episode. Use of these skeletal indicators to infer starvation in past populations is inherently limited by their non-specific nature; nutritional stress is simply one of many etiological factors that can cause skeletal arrests in growth. Nonetheless, the use of these indicators in conjunction with other skeletal evidence to infer starvation has frequently been employed in past bioarchaeological studies (e.g. Geber 2014; Huumonen et al. 2016; Lobdell 1984) and may continue to be warranted.

Harris lines are observed radiographically as opaque, transverse lines parallel to the epiphyseal plate of bones, and they represent disruptions in longitudinal endochondral bone growth (Mays 1985, 207). Under normal circumstances, cartilaginous cells would proliferate, forming a columnar framework that would later become ossified through osteoblastic activity (Mays 1985, 208). During disruptions in growth (caused, for example, by a lack of nutrients), cartilaginous growth ceases prior to maturing and osteoblastic activity lessens. Shrunken osteoblasts deposit bone gradually beneath the immature avascular cartilage cap, forming a thin primary stratum of trabeculae (Park 1964, 816–818). When normal cartilaginous and osteoblastic activity resumes (for example, due to the restoration of adequate nutrition), initial osteoblast deposition will occur along the primary stratum until the cartilage template has matured and vascularized, thickening this stratum to where it can be observed radiographically.

Harris lines are sometimes used by bioarchaeologists to indicate periods of starvation and subsequent partial to complete recovery. Early studies linked Harris lines to periods of stress, particularly nutritional deficiency (Park and Richter 1953), though the presence of Harris lines was later expanded by scholars to encompass stressful childhood events such as illness or trauma in addition to nutritional insults. However, later studies have shown that this relationship is not as clear or reliable as initially proposed. Papageorgopoulou and colleagues (2011) show that Harris lines can result from normal growth spurt processes among children who were not under considerable physiological or nutritional stress. Additionally, some children who do suffer from consistent physiological stress do not manifest Harris lines, as partial nutritional recovery is required for their formation (Lewis and Roberts 1997, 583). Therefore, caution should be exercised when analyzing Harris lines and nutritional conclusions should only be drawn when formulated from multiple sources of skeletal evidence.

Enamel hypoplasias are a class of enamel formation defects often caused by a metabolic disruption. During early development, tooth enamel grows incrementally, manifesting as microscopic striae referred to as lines of

Retzius. Linear enamel hypoplasia (LEH) can result when non-specific physiological stress disrupts ameloblastic enamel formation, presenting as linear grooves of thinned enamel along the crown of the tooth (Goodman and Rose 1991). While enamel is extremely sensitive to nutritional stress, Goodman and Rose (1991) caution that similar to Harris lines, LEH lacks specificity. In addition to periods of starvation, physiological and external stressors originating from weaning, infection, disease, or the environment are of potential etiological factors behind LEH (Katzenberg, Herring, and Saunders 1996; Méndez Collí et al. 2009).

The non-specificity of these indicators of arrested growth do pose limitations in their use as indicators of starvation. However, if the presence of Harris lines and LEH are used in conjunction with other approaches (e.g. "hunger osteopathies," stable isotopes), there is more potential to establish starvation as an etiological factor for these growth arrests. However, the complex etiologies of these indicators of arrested growth are not the only limitation in the application toward the issue of inferring starvation from the skeleton. There remains numerous data collection and analysis issues in the study of Harris lines and LEH, which impede their paleopathological observation *at all*, not including their use in inferring starvation-derived stress.

Assessing Harris lines comes with a myriad of methodological issues, including inter-observer error and underestimation due to the convention of assessing lines in the anterior-posterior view. These two issues have been addressed recently in scholarly literature. First with regards to the individual error problem, Suter and colleagues (2008) employed a semi-automatic Harris line detection software capable of detecting 60–65% of lines in order to reduce inter-observer error. Second, Harris lines have conventionally been assessed radiographically in the anterior-posterior view; however, in a recently published paper, Scott and Hoppa (2015) found that while it is conventional to take radiographs of Harris lines in the anterior-posterior view, radiographs in the medial-lateral view actually reveal more lines. This finding potentially addresses the inconsistencies of Harris line formation previously published in the literature. Use of semi-automatic detection software and radiographs in different anatomical views will potentially standardize the assessment of Harris lines paleopathologically and gain more accurate estimates of their prevalence in past populations, and by extension, their use in inferring nutritional stress.

There are also some limitations in observing LEH which in turn, impacts the utility of LEH as a reliable indicator of stress and consequently, starvation. First, analysis of LEH can be hindered by the fact that only some lines of Retzius (and perikymata, their external expressions) are macroscopically visible due to line spacing, line continuity, and teeth curvature (Cares Henriquez and Oxenham 2017). Discontinuous, compact, or non-linear hypoplastic defects are difficult to detect. Second, macroscopic evaluation of perikymata is not possible if teeth are unerupted or in regions of teeth where perikymata are not externally visible, and semi-destructive microscopic histology is not always an option with valuable bioarchaeological skeletal material. However, recent advancements in analysis of perikymata have addressed these limitations. Cares Henriquez and Oxeham (2017) employed a Micro Polynomial method for cases in which perikymata are not entirely visible on the enamel surface. This method allowed them to detect subtle depressions on the enamel surface in order to examine LEH in such cases when perikymata are not entirely visible but still represent temporary arrests in enamel secretion. With regards to the problem of observing perikymata which are not visually accessible, advancements in high-resolution imaging modalities may prove useful. For example, Le Cabec and colleagues (2015) used

synchrotron radiation micro-computed tomography (micro-CT) to assess perikymata non-invasively and non-destructively within unerupted hominin teeth.

On paper, Harris Lines and LEH represent a useful means to investigate past nutritional stress. However, in practice, the application of these skeletal indicators to study starvation has been hindered by their complex etiologies not specific to starvation and methodological limitations commonly used to assess them. Use of Harris Lines and LEH in conjunction with other approaches to detect starvation may in part address the inability to "pin down" their etiology, and improvements in methods used to detect these growth arrests will refine their use in paleopathology overall. In the last few years, there has been several methodological advancements in detecting skeletal growth arrests. Often, due to issues with observer error and lack of visibility when using conventional methods, Harris Lines and LEH cannot be accurately assessed paleopathologically. The recent techniques pioneered by Cares Henriquez and Oxenham (2017), Le Cabec, Tang, and Tafforeau (2015), Scott and Hoppa (2015), and Suter and colleagues (2008), and have improved the reliability of the assessment of these skeletal growth arrests.

"Wasting Away": Stable Isotopes and Starvation

Stable isotopes of carbon and nitrogen serve as potentially useful indicators of starvation and nutritional stress in past human diets, but in practice, their use has previously been limited by their lack of temporal resolution. In this regard, the discipline has methodologically advanced through the technique of microsampling dental tissues to track short-term isotopic changes.

The chemical analysis of stable isotopes is widely used in bioarchaeology as a source of information for paleodiet (Harrison and Katzenberg 2003; Prowse et al. 2004; Rissech et al. 2016), environment (e.g. water stress) (Ambrose and DeNiro 1987), breastfeeding and weaning practices (Burt 2013; Fuller et al. 2006), migration and residence (Dupras and Schwarcz 2001; White, Price, and Longstaffe 2007), and body physiology (Katzenberg and Lovell 1999; D'Ortenzio et al. 2015). Carbon and nitrogen isotopes are typically analyzed in making paleodietary inferences, but they are also a potentially useful source of information for interpreting physiological stress, including starvation.

The ratio of two carbon isotopes ^{13}C and ^{12}C, denoted by $\delta^{13}C$, often reflects whether the diet is based more heavily in C_3 or C_4 plants. These plants follow different photosynthetic pathways, meaning they fix CO_2 differently, resulting in different ratios of stable carbon isotopes. C_3 plants, such as trees, shrubs, and temperate grasses, fix carbon by the Calvin Benson photosynthetic cycle, and C_4 plants, mostly tropical grasses, fix carbon by the Hatch-Slack cycle (Katzenberg 2008, 423; van der Merwe 1982). As C_3 plants are depleted in ^{13}C relative to C_4 plants, it is possible to infer the relative contributions of each to diet (Katzenberg 2008, 423). Additionally, analysis of $\delta^{13}C$ can aid in differentiating between marine and terrestrial resources, as the main source of carbon for marine resources is dissolved carbonate whereas the main source of carbon for terrestrial resources is atmospheric CO_2 (Katzenberg 2008, 425).

Nitrogen isotopes provide information pertaining to trophic level. The proportion of ^{15}N to ^{14}N, represented by the notation $\delta^{15}N$, differ among different plants according to their nitrogen-fixing properties: legume plants fix nitrogen, resulting in a ^{15}N level close to atmospheric nitrogen levels whereas non-leguminous plants have elevated nitrogen levels (DeNiro and Epstein 1981). $\delta^{15}N$ is a valuable reflection of the protein sources of diet and can be used to infer trophic level in diet, as a stepwise 3‰ enrichment occurs with each increase in trophic level due to the fractionation of protein in which amino acids are broken down

and synthesized (Katzenberg 2008, 425; Reitsema 2013, 446).

How does this relate to physiological stress and starvation? Insufficient protein in the diet will force the body to catabolize its own tissues for protein. First observed by Hobson and colleagues (1993) in avian tissues, a state of starvation will induce the phenomenon of "wasting away," in which a body catabolizes its own tissues, resulting in an enrichment of nitrogen due to a trophic level increase. This isotopic phenomenon has also been observed in hair, as shown in clinical studies of anorexia nervosa patients (Mekota et al. 2006), and in forensic cases of suspected elder abuse (Baković, Vreča, and Mayer 2017). This process is not strictly linked to starvation, however, studies of bone and hair have shown that a similar effect occurs when individuals experience diseases such as chronic infection (Katzenberg and Lovell 1999), chronic illnesses (such as cancer and related cachexia; D'Ortenzio et al. 2015), or celiac disease (Scorrano et al. 2014). These diseases result when nitrogen enrichment occurs either as a result of the body diverting resources toward an immune or reparative response or due to tissue catabolization from a wasting condition.

However, while theoretically useful in interpreting starvation bioarchaeologically, there are some issues with these methods. As bones constantly remodel, they represent an isotopic average spanning several years (Sealy, Armstrong, and Schrire 1995) and therefore, short-term dietary or physiological changes, including those occurring immediately before death, may not be evident isotopically. This, incidentally, forms the basis of Morgan's (2013) argument that stable isotopes are insufficient indicators of starvation. Scholars have attempted to overcome this limitation by comparing stable isotope levels in teeth and bones (Sealy, Armstrong, and Schrire 1995) or by comparing isotope levels in the developed bone diaphysis to levels in the growing metaphysis (Waters-Rist et al. 2011). However, while constituting a substantial improvement to the isotopic averaging problem, these approaches arguably still lack the temporal sensitivity required to diagnose periods of starvation.

Julia Beaumont and colleagues (2013, 2016) have aimed to overcome this limitation by microsampling tooth dentine to detect short-term isotopic changes. Dentine forms according to both short-period, circadian rhythms (appearing as von Ebner's lines) and long-period rhythms (appearing as Andresen lines) developing in more or less weekly increments (Fitzgerald and Rose 2008, 241–242, 245). By microsampling dentine increments, either manually or with laser ablation methods, it becomes possible to track short-term shifts representing isotopic realities at the time of odontoblast secretion that would not be distinguishable in bone collagen.

While microsampling dentine was first employed to study weaning practices (see Eerkens, Berget, and Bartelink 2011), Beaumont and colleagues (2013, 2016) used this technique to investigate, with high temporal resolution, the Great Irish Famine (1845–1852). Beaumont and colleagues (2013) discovered likely Irish immigrants within the Lukin St. cemetery (London, England) based on dentine isotopic profiles. Then, in a study of the Kilkenny Union workhouse housing victims of the Irish Famine, Beaumont and colleagues (2016) studied the carbon and nitrogen isotope levels within dentine layers corresponding to approximately semi-annual intervals and compared the dentine levels with those contained within bone collagen. Initial dentine increments showed high $\delta^{15}N$ and low $\delta^{13}C$ corresponding to a period of starvation in which nitrogen isotope levels are elevated from "wasting away." Within many individuals, however, there was a shift to higher $\delta^{13}C$ and a fall in $\delta^{15}N$ corresponding to the adoption of the "Indian meal," a maize (C_4 plant) diet imported from America (Beaumont et al. 2016, 13).

These micro-sampling methods may also allow for starvation events to be observed in bone; due to the ability for bone to represent isotopic averages of several years to decades. This is because bone constantly remodels; localized resorption events that break down bone occur in concert with the formation of new osteons (the fundamental structures of bone). Therefore, it may be possible to observe minute and short-term changes in the chemical composition of bone related to nutritional stress by sampling from individual osteons themselves. Scharlotta and colleagues (2013) used laser ablation-inductively coupled plasma-mass spectrometry to evaluate isotopic changes in strontium in bone within a single osteon in order to evaluate changes in migration patterns. This methodology could similarly be applied to evaluate intra-osteonal changes in carbon and nitrogen isotopic related to starvation.

The improvement in temporal resolution of stable isotope analysis to detect periods of nutritional stress is crucial to paleopathological studies of starvation. Prior to the use of either metaphyseal bone collagen sample (e.g. Waters-Rist et al. 2011), or more recently, incremental dentine samples for stable isotope analysis (e.g. Beaumont et al. 2013, 2016), stable isotope analysis of skeletal remains represented a dietary average and therefore was not a useful means to detect short-term dietary changes. The onset of microsampling incremental structures for stable isotope analysis has already shown its potential for the study of starvation bioarchaeologically and therefore challenges the view that starvation is indistinguishable in skeletal remains.

CONCLUSION

In a 2013 review, Morgan argued that in the absence of documentary or iconographic data, famine and starvation are invisible; in other words, skeletal remains do not contain enough information for paleopathologists to infer periods of famine or starvation. This paper, in response, has challenged this argument by reviewing paleopathological approaches previously used in the study of starvation, discussing both the limitations of each approach as well as showcasing new and emergent techniques that may improve the utility of each approach in inferring starvation. While the study of starvation remains constrained by the above-mentioned limitations, such as the osteological paradox as well as the non-specificity of osteological conditions, recent advancements in the discipline show potential for the study of starvation.

The use of the "hunger osteopathies" (i.e. premature secondary osteoporosis with some overlay of osteomalacia) to infer starvation has been limited by a number of factors. However, improvements in age estimation may help elucidate whether osteoporosis is primary or secondary, and the discipline of paleopathology as a whole has shown a recent willingness to borrow methodological approaches from other fields in order to advance its understanding of these conditions. As non-specific signs of stress with several methodological issues, Harris Lines and linear enamel hypoplasia have numerous issues when used to assess physiological stress. However, recent advancements in standardization and visualization of these growth arrests may increase the overall accuracy of their use in paleopathology, and by extension, studies of past starvation. Stable isotopes of carbon and nitrogen have the potential to represent the phenomenon of "wasting away"; however, bones represent an isotopic average and lack the temporal resolution to reflect short-term dietary and physiological changes. Recent advancements in microsampling incremental structures such as dentine are extremely promising for overcoming this limitation. In sum, taking multiple lines of evidence together presents a stronger case for starvation in the bioarchaeological record that may be further strengthened by the multitude of technological advancements and emergent techniques that the field has adopted

within the last decade. Overall, advancements within the last decade provide an optimistic view of future prospects for the paleopathological analysis of starvation, challenging Morgan's (2013) argument that starvation is invisible bioarchaeologically.

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REVIEW ARTICLE

The Effect of Agriculture on Health in Neolithic Populations in the Levant

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ABSTRACT
The purpose of this paper is to analyze the effect that the onset of agriculturalism had on the lives and health of the various Neolithic populations in the Levant during that time. Analysis of bones found at the site of Abu Hureyra (which was occupied by both hunter-gatherers and agriculturalists) show evidence for increased physical stress in the skeletons of agriculturalists, which was due to the physical stress of agriculture (Molleson 1994). Furthermore, musculoskeletal markers on Neolithic male skeletons were shown to be more symmetrical than on Natufian male skeletons. This correlates with the shift from hunting to farming (Eshed et al. 2004). It was also found that the agricultural lifestyle increased the infectious disease rate of farming populations when compared to their Natufian counterparts (Eshed et al. 2010). The shift to an agricultural lifestyle brought about many changes for dental health as well. In Neolithic populations, the rates of dental caries increased, while the wear on their teeth decreased (Eshed, Gopher, and Hershkovitz 2006; Richards 2002). This was due to the increased consumption of carbohydrates and the decreased use of teeth as tools, respectively (Eshed, Gopher, and Hershkovitz 2006; Richards 2002). Furthermore, the mandible was shown to decrease in size in the Neolithic populations when compared to Natufians (Pinhasi, Eshed, and von Cramon-Taubadel 2015). These dental changes were also seen in other areas during the agricultural shift, such as South Asia and South America (Eshed, Gopher, and Hershkovitz 2006).

Keywords: agriculture, Neolithic, Natufians, Levant, health profile, paleopathology, skeletal analysis

INTRODUCTION

The shift from hunting and gathering to agricultural subsistence occurred during the Pre-Pottery Neolithic period (PPN) at approximately 8000–6000 BC (Eshed et al. 2004). In the Levant, a geographical location in the Middle East that includes areas of Lebanon, Jordan, Palestine, Israel, and Syria, the shift to agriculture occurred with changes in settlement patterns, social organization, and ritual practices. Although there is much controversy regarding the nature and sequence of this relation, this paper will instead focus on the health implications of these interrelated changes rather than how they came to be. The presence of the Fertile Crescent, an area of fertile land which spanned from the Persian Gulf to the Mediterranean Sea, was another variable associated with the emergence of agriculture (Eshed et al. 2004). Nearby this

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region, along the shoreline of the Mediterranean, was the main area of Natufian occupation prior to the advent of agriculture. The Natufians were a group of hunter-gatherers who lived a semi-sedentary lifestyle wherein they hunted for gazelle and gathered wild cereals (Eshed et al. 2010). During this period many new lifestyle patterns emerged, such as subsistence changes, more sedentary settlement, and social complexity. These interrelated changes in lifestyle, as well as the emergence of agriculture, caused many changes to human health. These changes also characterized the emergence of the Neolithic population. The earliest division of this population, the Pre-Pottery Neolithic, is associated with the earliest evidence of plant domestication (Eshed et al. 2010). When comparing the Natufian and Neolithic cultures that were present in the Levant during the transition to agriculture, many differences can be observed. This paper will discuss the many effects that agricultural subsistence had on the health of the Natufian and Neolithic populations occupying the Levant by comparing health profiles from each population in addition to analyzing Natufian health before and Neolithic health after the introduction of agriculture.

To study the effects that agricultural subsistence had on the populations living in the Levant during this time, one must be able to analyze the skeletal remains of the populations. Estimating the age and sex of skeletal remains are two useful analytical techniques used by archaeologists; however, this is only possible when remains with morphological features that indicate age or sex, such as the pelvic bone or skull, are found. These identifications can be used to group skeletal remains based on shared attributes, such as sex and age. For example, comparing how health profiles differ between adults versus subadults, or between males and females, can reveal intracultural variation between members of the same group or among groups with similar cultural characteristics. Comparisons can also reveal different physiological markers, which can be used to deduce differences in lifestyle. (Hawkey and Merbs 1995).

The age of skeletal remains can be determined by examining either tooth eruption or bone fusion. Humans are born with two sets of teeth. An individuals age at death can be determined by counting how many sets of teeth are in the skull (Buikstra and Ubelaker 1994). The age of skeletal remains can also be determined using bone fusion. Different bones fuse at different ages; however, one limitation is that once the biological age of 23 is reached, most bones have fused (Buikstra and Ubelaker 1994). Consequently, skeletal remains beyond this age cannot be differentiated from one another. While the bones of a human will completely fuse by the age of 23, this excludes suture lines on skulls, which begin to fuse at the age of 24 and fuse completely by age 30 to 40 (Meindl and Lovejoy 1985).

The sex of skeletal remains can be determined by comparatively analyzing the pelvic bones. The male pelvis is typically narrower than the female pelvis, with the ilia positioned close together. The female pelvis is wider, with the ilia spread wide apart; the ilia are positioned farther apart in a female to accommodate childbirth. The skull can also be used to identify sex. A male skull has a square jaw and more pronounced brow ridges than a female. In contrast, a female skull instead has a round jaw and chin, as well as a rounded forehead (Buikstra and Ubelaker 1994).

Another research method that is important in analyzing sites in association with agriculture is paleobotany, the study of fossilized plant remains. Paleobotanical evidence can be used to identify the time period in which the intensification of cultivation of domestic cereals or legumes occurred. According to paleobotanical evidence, agriculture occurred in the Levant at the beginning of the Holocene (approximately 11,500 years ago). Using paleobotany, it was discovered that Natufian

populations mainly processed wild cereals, whereas the Neolithic populations were found to shift from wild cereal processing to the domestication of cereals and legumes while continuing to rely on wild seeds, fruits, and hunting. This data can be used to contextualize the daily life and diet of the individuals that lived in this area. Reconstructing diet can help to explain the wear on teeth and to understand the many physical stress markers and pathologies present in these populations (Pinhasi, Eshed, and von Cramon-Taubadel 2015).

MARKERS OF PHYSICAL STRESS

One of the changes that occurred with the shift to agriculturalism was the onset of physical stress, which can be determined by studying any signs of osteoarthritis on skeletal remains as well as any muscle markings that may indicate physical stress (Eshed et al. 2010). Numerous studies have shown that the transition to an agricultural lifestyle leads to increased physical stress levels. In a study conducted by Molleson (1994), 162 skeletons found at the site of Abu Hureyra were examined and used to reconstruct the daily lives of the people who had lived there. The data collected at Abu Hureyra were extremely important, as this site was occupied two different times. The first inhabitants of this site were a pre-Neolithic group who lived there approximately 11,500–10,000 years ago. The second inhabitants of this site appeared approximately 200 years later. The latter group represented a Neolithic farming community. These two populations were compared using their skeletal remains, which provided a comparison between pre-Neolithic and Neolithic society (Molleson 1994).

One of the first signs of stress found on the Neolithic bones were changes in the upper vertebrae of the adolescents. This stress was most likely due to carrying heavy loads, such as game, grain, and building materials. This change in the upper vertebrae was mainly found in the bones of adolescents, which indicated that adolescents were heavily involved withagricultural labour The preparation of grains was a physically demanding activity which caused many deformities in the neck vertebrae. This degeneration of the neck vertebrae may have been caused by kneeling to grind grains by hand using saddle querns (grinding tools made of stone), which were found during excavations conducted by Molleson (1994). However, these deformities may also have developed due to the constant pounding of seeds using a pestle and mortar while kneeling. Furthermore, the act of grinding puts pressure on the hips and lower back in addition to the pressure on the toes and knees during kneeling. This additional pressure can cause damages to the vertebrae, most commonly disc damage and crushing. The bones found at Abu Hureyra exhibitied indications of physical stress. For example, a spine belonging to a Neolithic Abu Hureyra female showed multiple bony growths along the vertebrae. These growths are believed to have occurred due to the hours spent bent over, kneeling, and grinding grains. A typical female in this area would have kneeled while using a mortar and pestle for grinding grains. This position would have placed strain on the knees, toes, lower back, and arms. These areas of the skeleton would contain physical markers of this excessive strain placed on them, and therefore can be used to identify communities that were processing grains this way (Molleson 1994).

In another study conducted by Eshed et al. (2004), Natufian and Neolithic populations in the Levant were compared by looking at musculoskeletal markers (MSM) in the upper limbs. When comparing males and females within the Natufian populations, it was discovered that females tended to have a higher level of bilateral symmetry in MSM compared to males; males tended to be more asymmetric. This asymmetry may have been caused by

hunting, which put greater stress on the dominant throwing hand of a male. Neolithic males and females were also compared; however, the data showed that there were more similarities in MSM between these groups. The findings showed a greater similarity between male and females, as well as decreasing asymmetrical lateralization in males. The increasing similarity of male and female MSM was likely due to the intensification of activities, such as hunting, gathering, and producing stone tools as well as the introduction of new activities, such as mud-brick construction (Eshed et al. 2004). Another difference discovered when comparing the MSM of Neolithic males and females was that females tended to have higher MSM scores than males in muscles around the elbow, as well as muscles attached to the forearm. These muscles are mainly involved in finer hand movements. This indicates that there were specific types of labours allotted for males and females. Females were most likely responsible for activities that required focused dexterity, such as basketry. The results of this study showed that labour increased in both sexes with the onset of agriculture; however,

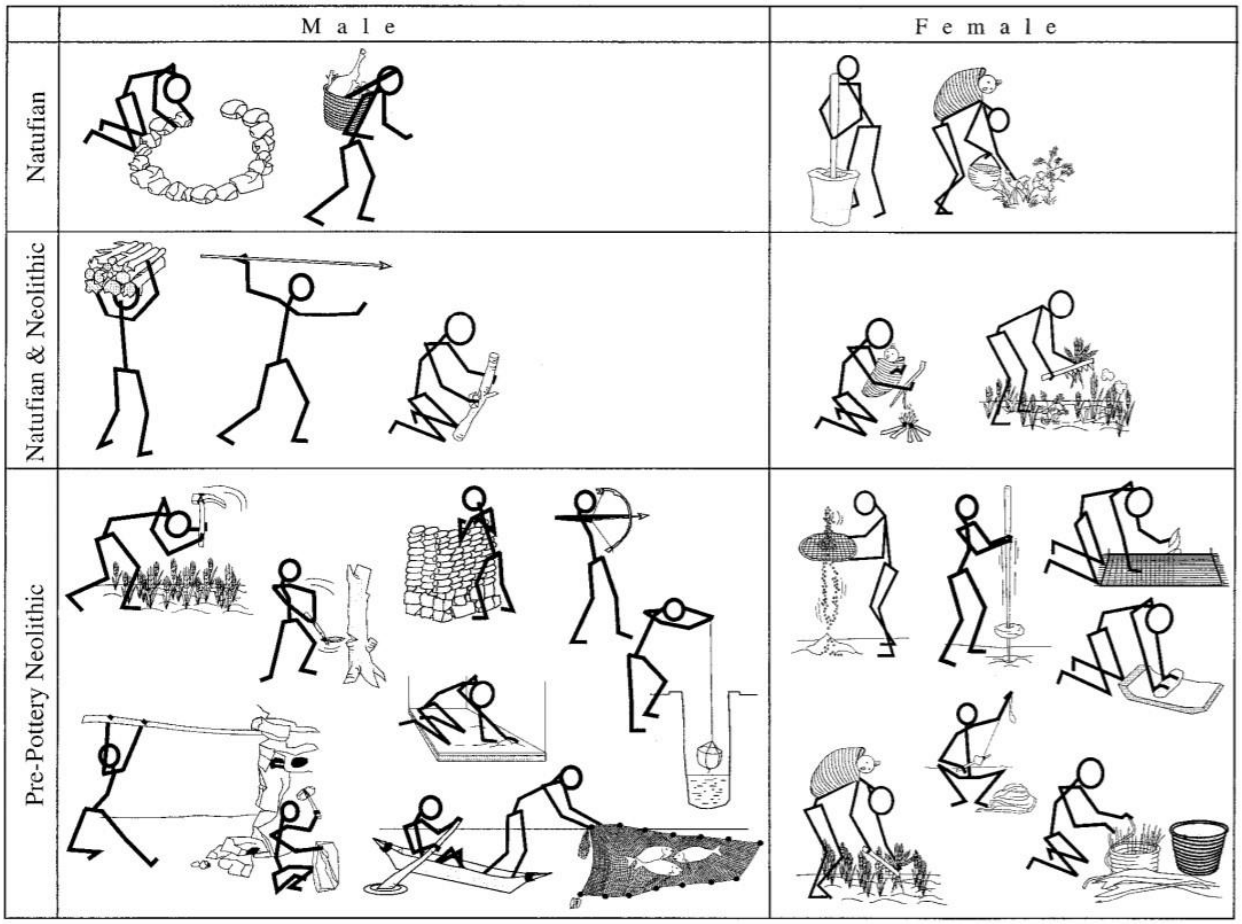

FIGURE 1— *Image displaying the major activities for Natufian and Neolithic males and females. Note: This chart displays the different activities that were performed by males and females in Natufian and Neolithic populations. As shown, there is an increase in activities for Pre-Pottery Neolithic populations which is related to the increase in MSM in skeletal remains. The increase in both male and female workload also explains the increased similarity in MSM in male and female skeletons (Eshed et al. 2004). Reproduced with permission from the American Journal of Physical Anthropology, John Wiley & Sons.*

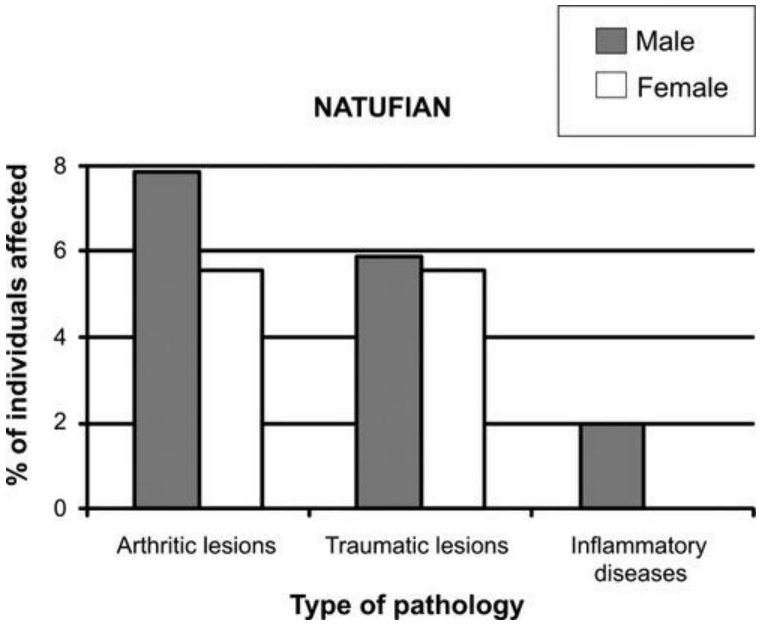

FIGURE 2— *Natufian pathology bar graph. Note: Bar chart displaying the occurrence of three different pathologies (arthritic lesions, traumatic lesions, and inflammatory diseases) amongst Natufian male and female skeletal remains. In all three categories, male Natufians scored higher than the females. It also shows that no Natufian female showed any evidence for inflammatory disease (Eshed et al. 2010). Reproduced with permission from the American Journal of Physical Anthropology, John Wiley & Sons.*

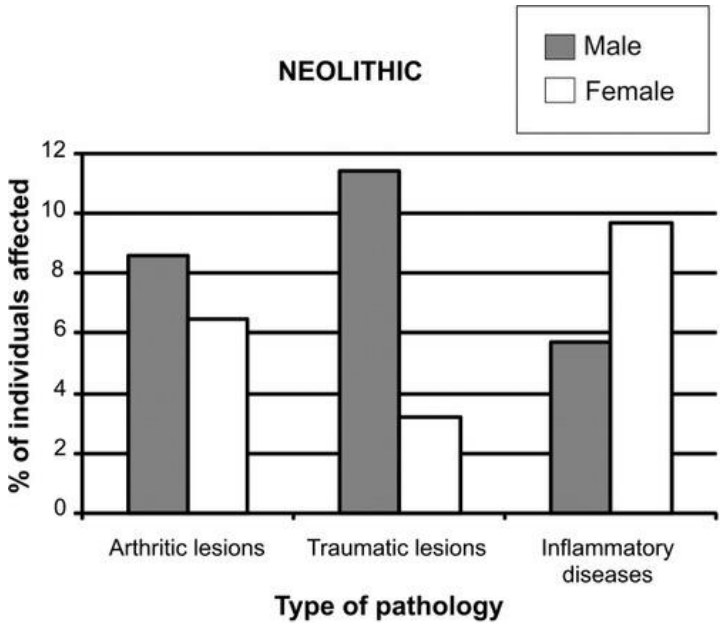

FIGURE 3— *Neolithic pathology bar graph. Note: Bar chart displaying the occurrence of three different pathologies (as in Figure 2) amongst Neolithic male and female skeletal remains. The most important difference shown is the increase in inflammatory disease for both male and females. Furthermore, it shows that females showed a higher increase in inflammatory diseases than males (Eshed et al. 2010). Reproduced with permission from the American Journal of Physical Anthropology, John Wiley and Sons Inc.*

females were more involved with subsistence activities than males, which was proven by the increasing MSM scores found in Neolithic females (Eshed et al. 2004).

As shown by Figures 2 and 3, arthritic lesions increased in Neolithic populations compared to the Natufians. Furthermore, there was little difference in the rate of arthritic lesions between sexes. This trend was also reported at Dickson Mound, United States, as well as at pre- and post-agricultural sites in Portugal (Bridges 1991). These trends reveal a positive association between increased physical stress and the onset of agriculture. In the Levant, arthritic lesions were shown to be more prevalent in the male Neolithic population than the female population (Eshed et al. 2010). These arthritic lesions reflect the intensification in physical activities and may indicate sex-specific occupations that occurred during the transition to agriculture (Eshed et al. 2004).

A study conducted on hunter-gatherer and farming populations who occupied Northwestern Alabama during the transition to agriculture revealed more information on how degenerative joint diseases affected these populations, and how these changes were related to the transition to agriculture (Bridges 1991). In these populations, it was proven that there were very few differences between male and female hunter-gatherers. In contrast, it was shown that male skeletal remains from farming societies displayed a significantly higher level of osteoarthritis than females. This difference indicates sex-specific activities in this society. It is believed that the osteoarthritis was a response to the increased workload, which increased the physical stress placed on the body (Bridges 1991).

Physical stress markers on skeletal remains can indicate how different stresses on the body affect bones. Subsequently, studying bones and stress markers from the time period of agricultural intensification can reveal the effects that agriculture had on the human body. Based on the aforementioned analyses, there is a clear association between the transition to agriculture and the physical stress placed on the body; this association has been reported in multiple early farming communities (Bridges 1991).

INFECTIOUS DISEASE

The onset of agriculture also led to the emergence of civilization pathogens (Eshed et al. 2010). Civilization pathogens are pathogens that require an increased population in order to persist in the environment (Pearce-Duvet 2006). It is estimated that these pathogens would not exist without the development of agriculture. This is because prior to agriculture, populations were not dense enough to allow for these pathogens to persist, as transmission from person-to-person is vital for their survival. These pathogens were likely extracted from domesticated animals, such as sheep and goats. During the early stages of agriculture, livestock was kept close to living areas. This close proximity facilitated the transmission of pathogenic bacteria from livestock to humans (Eshed et al. 2010). The analyses of Neolithic skeletal remains from the Levant have revealed evidence of systemic infections, which confirmed the presence of infectious diseases such as tuberculosis and syphilis within these agricultural populations (Eshed et al. 2010).

Infections can cause lesions to form on skeletons, which is how archaeologists are able to diagnose infectious diseases, such as tuberculosis (Hershkovitz et al. 2008); however, it is important to mention the osteological paradox. This concept addresses the obfuscating nature of osteological pathologies wherein individuals who die shortly after developing an infection may not show any signs of infection on their skeleton, while individuals who live with infection may develop lesions on their skeleton. Due to this paradox, the existence of

a disease may be misinterpreted; thus, interpretations of skeletal lesions must be carefully considered (Siek 2013; Wood et al. 1992).

Tuberculosis can cause changes in the skeleton, such as the collapse of the vertebrae, osteomyelitis (the infection of bone), and periosteal reactive lesions (the formation of bone due to injury) (Hershkovitz et al. 2008). These skeletal changes have been reported in many areas, including predynastic Egypt (3500–2650 BC), and are associated with early agriculturalists (Hershkovitz et al. 2008). Using skeletal evidence, it was determined that tuberculosis was a predominant disease in the Neolithic populations in the Levant (Eshed et al. 2010). These lesions may have occurred due to changes in lifestyle and subsistence, including sedentism, the increase of population density, the introduction of facilities used for storage, animal domestication, and farming. It is likely that storage facilities, which led to the introduction of commensal species such as mice, coupled with animal domestication and sedentism enabled pathogenic strains to jump from animals to humans, subsequently increasing the rate of infectious disease among agricultural populations in the Levant (Eshed et al. 2010).

In Eshed's (2010) study on the health profiles of Neolithic and Natufian skeletal remains, it was concluded that there was a significant increase in infectious disease occurring in Neolithic populations compared to the Natufian populations. While it is not possible to obtain direct evidence for infection resistance, inferences can be made based on data. If resistance had not formed, there would be an increased mortality rate as well as a decreased life expectancy age; however, that is not what the researchers found. In a study conducted by Eshed et al. (2003), skeletal analysis and the construction of a life table (a technique measure mortality) showed that the life expectancy age at birth and the mean age at death for adults increased for the Neolithic population (Eshed et al. 2003). This data proved a lower rate of mortality and an increased life expectancy for this group (Eshed et al. 2003). Furthermore, there was an apparent rise in improvement for health in the Neolithic population, which was expected with increased resistance against several infectious diseases (Eshed et al. 2010). In a study conducted by Smith and Kolska-Horwitz (2007), the health profiles of Middle Pre-Pottery Neolithic B (MPPNB) villages and late to final Natufian Pre-Pottery Neolithic A (PPNA) villages were determined through multiple analytical techniques. The MPPNB period is associated with early agricultural villages, while the late to final PPNA period is associated with the final Natufian period. Smith and Kolska-Horwitz (2007) concluded that the health of the MPPNB populations were significantly better than populations from the previous PPNA period by identifying periods of high and low health. The periods of low health were associated with environmental deterioration and settlement pattern changes, while the period of high health was associated with an agricultural lifestyle. The results of both studies support the idea that an improvement in health (which involves a decreased mortality rate and increased life expectancy age) would be associated with an increase in resistance against several infectious diseases (Eshed et al. 2003, 2010; Smith and Kolska-Horowitz 2007)

Studying skeletal remains found in the Levant indicates that the rate of infection among occupying populations increased with the transition into agriculture. Studies involving early agricultural societies worldwide have also shown that the emergence of agriculture is associated with the emergence of infectious disease such as smallpox, measles, malaria, schistosomiasis, and tuberculosis (Hershkovitz et al. 2008). Additional studies could be used to understand if there were any sex-specific differences in the rates of infectious diseases that could further contribute to understanding

differences in sex-specific activities. Furthermore, research conducted on ancient infectious diseases can also aid in the understanding of the evolution of these diseases and how they evolve to affect humans differently.

DENTAL HEALTH

The transition to agriculture is also associated with many distinctive changes in dental health between the Natufian and Neolithic populations that occupied the Levant. In a study comparing these populations, many differences in oral health were noticed (Richards 2002). The Natufian population were found to have fairly healthy teeth with very little evidence for caries (the decay and crumbling of a tooth). In contrast, in the Neolithic populations, teeth were found to have increased rates of caries. The increased rates of caries are believed to be due to the diet change associated with agriculture. The Neolithic populations in the ancient Near East are believed to have an increased diet of plant foods containing carbohydrates, which increased their rates of caries (Richards 2002).

When compared to the Natufian population, the Neolithic dental remains were found to have less dental wear on them. This also follows the trend displayed by the transition to agriculture found in other parts of the world (Eshed, Gopher, and Hershkovitz 2006). For example, in a study conducted by Molnar (1971), the differences in tooth wear between non-agricultural and agricultural Native Americans from California, the Southwest, and the Valley of Mexico showed the same differences found between Natufian and Neolithic populations. This shows a strengthened association between the emergence of agriculture and a lower rate of tooth wear. This lower rate of tooth wear for Neolithic agricultural groups may be due to the decrease in strenuous mastication (Eshed, Gopher, and Hershkovitz 2006). This decrease may have been due to the declining use of a stone mortar and pestle to pound food items, which would introduce tiny stone pieces into their diet that required intensified chewing (Eshed, Gopher, and Hershkovitz 2006). Instead, Neolithic populations increasingly ground their food items. Furthermore, the wear on Natufian teeth can also be explained by the usage of their teeth as tools. For example, the Natufian population found at Ain Mahalla contained wear grooves on their teeth from using their teeth as tools, which is shown in Figure 4.

FIGURE 4— *Drawing of a Natufian. Note: A drawing of how Natufians may have used their teeth as tools. The person in the drawing is shown to be holding staves in their teeth. This material could be used to make either baskets or fishing nets (Eshed, Gopher, and Hershkovitz 2006). Reproduced with permission from the American Journal of Physical Anthropology, John Wiley & Sons.*

Another explanation can be derived from the Natufian usage of mortars and pestles used for pounding nuts and seeds. The nuts and seeds processed this way were coarse, which would have caused dental wear on the teeth (Eshed, Gopher, and Hershkovitz 2006).

Dental attrition, a type of tooth wear caused by tooth-to-tooth contact, is also prevalent in pre-agricultural societies. Dental attrition rates are affected by the type of food eaten, the consistency or texture of the food, as well as how the food was prepared. The shift to agriculture brought many changes in all three categories, which are associated with a decrease in dental attrition rates in agricultural societies. This decrease is also attributed to the decrease in the roughness of agricultural foods due to the declining use of a stone mortar and pestle for food processing. Instead, grinding had become more prevalent (Eshed, Gopher, and Hershkovitz 2006).

FIGURE 5— *Photo of Natufian dental attrition. Note: A photo displaying the dental attrition that is typical of the Natufian populations. Note that the tops of the teeth are flattened. Natufian populations typically have a pattern of wear that shows an even flatness across all teeth (Eshed, Gopher, and Hershkovitz 2006). Reproduced with permission from the American Journal of Physical Anthropology, John Wiley & Sons.*

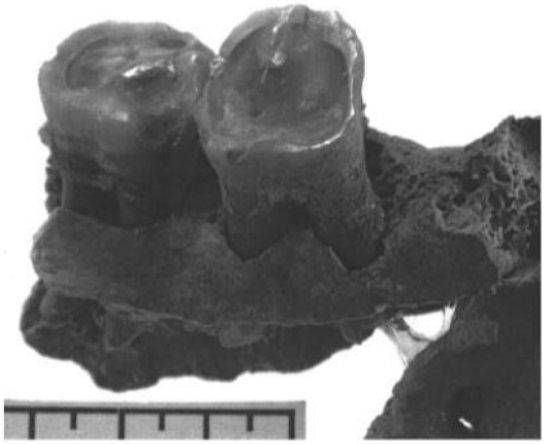

FIGURE 6— *Photo of Neolithic dental attrition. Note: A photo displaying the dental attrition that occurred in Neolithic populations. In Neolithic populations, the attrition is more angular than flat and was not evenly distributed (Eshed, Gopher, and Hershkovitz 2006). Reproduced with permission from the American Journal of Physical Anthropology, John Wiley & Sons.*

Declining dental health in response to the beginnings of agriculture occurred in other parts of the world as well. The domestication of rice in South Asia as well as the domestication of maize in South America caused increased rates of caries in the agricultural populations that were present in these areas during the transition to agriculture. The rates of caries also increased in European populations; however, in some populations, the changes were not present until the Bronze Age (3000–1200 BC). Direct stable isotope analysis was used to track the cultivation of maize in South America, which corresponded with the increased caries shown in the teeth of agriculturalists in South America. In many areas, there was shown to be a general decrease among dentition size as well. This decrease in size is most likely due to agriculturalists switching their diets to easier-to-chew foods, such as bread and porridges, which required less robust dentition (Eshed, Gopher, and Hershkovitz 2006).

In a study conducted on the Abu Hureyra populations, Molleson (1994) identified a subset of the population that was involved in fibre production. This population was identified to be mainly female. This population of fibre specialists was identified by distinctive grooves found on their teeth and by wear on the teeth evidenced by larger mandibular joint surfaces. Similar dental characteristics were shown in ethnographic study populations who used their mouths as clamps and tools in fibre processing. Comparisons between the two populations allowed archaeologists to conclude that the skeletal remains that had these certain characteristics partook in similar activities. This example demonstrates that by analyzing dental remains, sex differentiation between activities can be recognized (Molleson 1994).

The transition to agriculture is associated with a significant reduction in size of the mandible. However, this change cannot be attributed to low dental wear, as that would cause hunter-gatherers to have a reduced mandible size as well, which is not the case for hunter-gatherer groups (Pinhasi, Eshed, and von Cramon-Taubadel 2015). There are many key differences between hunter-gatherer and agriculturalist dentition features. Hunter-gatherer populations usually have a larger crown size, as well as occlusal and interproximal tooth wear. Malocclusion (the misalignment of the teeth) dental crowding, and oral disease are nearly non-existent in hunter-gatherer populations. Hunter-gatherer populations also show a positive association between mandibular shape and dental shape, while this association was not found in agriculturalists. This lack of association in agriculturalists may be attributed to the shift towards agriculturalism and sedentism, as agriculture included a more consistent diet. In addition to the changes in lifestyle and diet, mandibular plasticity caused a reduction in dentition size amongst agriculturalists (Pinhasi, Eshed, and von Cramon-Taubadel 2015).

The adoption of agriculture initiated major changes in the human diet. These changes are associated with the agriculturalist populations in the Levant that underwent major changes in dentition. The rate of caries increased with agriculture, while tooth wear decreased. The size of the mandible and dental attrition decreased as well. Furthermore, using data from tooth analyses, archaeologists were able to reconstruct lifestyle and diet. Using ethnographic data and dental analysis, it is possible to contextualize the lives of the populations present in the Levant during the transition to agriculture. This context can be used to deduce what life was like during the Agricultural Revolution.

CONCLUSION

The purpose of this paper was to examine the differences between the Natufian popula-

tion that existed before the advent of agriculture in the Levant and the Neolithic population that existed afterwards in order to understand the impacts of agriculture on physical health. Analysis of skeletal remains through the study of paleopathology is important in this examination, as it allows for many aspects of ancient civilization to be understood such as daily life and health. The transition to an agricultural lifestyle brought many new changes to the lifestyles of the Natufians, which caused major changes in their diet and health. Many of these changes had a negative impact on humans, as it brought an increased rate of physical stress and infectious disease; however, some impacts were positive, such as the decreased amount of tooth wear. The new diet that Neolithic populations consumed was less coarse than it had been among pre-agricultural Natufians, resulting in lower instances of tooth wear among Neolithic skeletal remains. Through research on skeletal remains, the change brought on by agriculture can be further studied in order to give more context to what life was like for Levant populations during the transition to agriculture. By looking at skeletal markers, different activities can be determined, which can be used to reconstruct ancient life. This is important as it expands the current knowledge that is available on how people in the Levant lived prior to an agricultural lifestyle as well as how they lived afterward. With further research about pre- and post-agricultural societies across the world, it can be determined why an agricultural society paved the way for civilizations to form as well as why this subsistence pattern has remained dominant among human populations.

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BOOK REVIEW

A Critical Review of Healing Elements: Efficacy and the Social Ecologies of Tibetan Medicine

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ABSTRACT
This article offers a critical review of *Healing Elements: Efficacy and the Social Ecologies of Tibetan Medicine*. The ethnography provides rich and comprehensive insights regarding the triumphs and tribulations of Sowa Rigpa (traditional Tibetan medicine) as the medical system is translated across diverse contexts to ensure its continuity within the globalized world; however, these insights can be broadened by more deliberately acknowledging and investigating the (post)colonial subtexts underlying these translations. Incommensurability emerges throughout the ethnography in the form of tensions that arise as tacit knowledge is translated to explicit knowledge in the quest for legitimization. It is argued that expounding the nature of this incommensurability by engaging with rather than rejecting polarized notions of "traditional" and "modern" paradigms can reveal that non-biomedical medical systems and medically pluralistic contexts more broadly are inundated by (post)colonial processes. Borrowing Blaser's (2013) notion of "Sameing," it is demonstrated that translation involves (post)colonial processes of assimilation, as Sowa Rigpa is rendered visible through Good Manufacturing Practices (GMP), and appropriation, as it is made palatable through pharmaceutical commodification. Furthermore, it is argued that these processes mobilize mimesis and essentialization to transform Sowa Rigpa into a system that is both legitimized and acquiescent to the imperatives of varying external regimes. The simultaneity of these effects and the position that they are not mutually exclusive is asserted throughout the review as further evidence of (post)colonization.

Keywords: critical review, Sowa Rigpa, traditional Tibetan medicine, efficacy, (post)colonialism, assimilation, appropriation

OVERVIEW

In *Healing Elements: Efficacy and the Social Ecologies of Tibetan Medicine*, Craig (2012) employs the following questions to guide the exploration of what it means to say that a medicine "works": "how is efficacy determined? [And] what is at stake in these determinations?" (4). These questions are considered within the context of translating and therefore legitimizing contemporary Sowa Rigpa (Tibetan Medicine) as a valid medical system according to the standards of varying external regimes. Craig uses creative nonfiction to recount this multi-sited ethnography, which spans approximately one decade and draws on observations, exchanges, and

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reflections from sites in Nepal, Tibetan areas of China, Bhutan, and the United States. The overarching analysis considers the translations that take place through the engagements between the traditional Tibetan medical system and the varying imperatives imposed by modern external regimes and entities, including biomedicine, clinical research, national and international governmental regimes, commodification processes, conservation-development projects, and identity politics. These engagements occur as the proponents of Sowa Rigpa—including the Tibetan and Himalayan practitioners known as *amchi*, patients, and administrators navigate the incommensurability of traditional and modern paradigms.

Craig (2012) considers efficacy throughout these navigations using the theoretical framework of *social ecologies*, defined as "the interrelationships among environmental, socioeconomic, biological, political, and cosmological sources of, or explanations for, health problems" (5). This framework extends beyond acknowledging the relationship between health and environment. Instead, the approach conceptualizes nature as a system of processes and as a locus of sociocentric relations between human and non-human beings and the divine forces that contribute to an "animate earth" (Craig 2012, 6), a concept that reiterates the sentiments underlying Tibetan medicine. Throughout the ethnography, Craig demonstrates that legitimizing Sowa Rigpa relies on explicating the medical system's efficacy. This work involves translating Sowa Rigpa's traditional paradigm, which in practice depends on the translation of tacit knowledge; this is the central premise of the work.

CRITIQUE

The overarching theme of this ethnography is *translation*; namely, the translation of *tacit knowledge* to *explicit knowledge*. Tacit knowledge refers to "knowledge that *is not* explicated" (Collins 2010, 2; emphasis is my own) while explicit knowledge is that knowledge that *is* articulated. This translation is demanded by competing and conflicting evaluative frames imposed by the imperatives of the aforementioned external entities and regimes, which are used to determine the legitimacy of Sowa Rigpa. Tensions arise when considering the divergence between whether tacit knowledge "is not" or "cannot" (Collins 2010) be explicated. This tension is most pronounced in the demand for demonstrating efficacy in order to verify Sowa Rigpa's utility; a pressure which saturates this ethnographic context. This demand is based on an epistemological claim that reveals a predilection for one system of knowledge (that which undergirds biomedical science) over others (that which undergirds Tibetan medicine) (Coulter 2004). Sowa Rigpa proponents must cautiously navigate this predilection, as it incurs the "risk of irremediable loss or change of *meaning*" (Collins 2010, 26; emphasis by author). This risk refers to the epistemic violence that occurs when the process of demonstrating efficacy can cause treatment modalities to be "stripped of the paradigm within which they traditionally resided" (Coulter 2004, 114) and therefore subjugated and reduced.

While the nature of this incommensurability as an epistemological predilection that is born of a paradigmatic clash and perpetuated by (post)colonial underpinnings is not expounded explicitly in the ethnography, this review will assert that such elaborations can strengthen the work's broader relevance significantly. To clarify, the translation of tacit knowledge to explicit knowledge involves navigating incommensurable traditional and modern paradigms. This incommensurability manifests in the form of tensions, which Craig (2012) notes by recalling instances during translation (the translation of language, practices, and materials) when words "resist trans-

lation" and objects "defy exchange" (252). But what does this mean? What is being defied and resisted? And why? Craig does address paradigmatic barriers by challenging and refusing to dignify views that entertain the limiting polarized notions of "traditional" (underdeveloped) versus "modern" (developed) medicine; however, in rejecting the premise of these polarities by refraining from engaging with them overtly, the (post)colonial mechanisms undergirding and sustaining them, as well as the subsequent incommensurability that ensues throughout the ethnography, remains relatively uncontextualized. The wider implications of this lack of contextualization are that it contributes to maintaining the covertness of (post)colonialism as it operates under the guise of modernity and, therefore, must be rectified if proper exposure and interventions are to occur.

ANALYSIS

Put simply, (post)colonialism refers to—or rather, implies—the aftermath of colonialism. Despite the fallacy perpetuated by the term, this definition requires an elaboration on *colonialism*. Fundamentally, colonialism is a process perpetuated by the production of *culture* as a systematic and bounded entity, which is premised on the dualistic concepts of *self* and *Other* (Abu-Lughod 2006; Hall 1992). This opposition is enacted by "dismantling the essential categories of [O]ther societies" (Watts 2013, 31) and simultaneously reiterating the self. This distinction is sustained and operationalized by coercive power structures (Watts 2013; Blaser 2013), which reinforce a dominant self and, therefore, a dominated Other. Consequently, in considering colonialism as the *production* of culture and culture as the *production* of a self and an Other, (post)colonialism can then be understood as a shift in production processes— namely, a shift from *Othering* (understood here as characterizing colonialism) to *Sameing* (understood here as characterizing Blaser's [2013] notion of an "all-encompassing modernity" and therefore [post]colonialism). Borrowing Blaser's (2013) connotation of "Sameing," this critical analysis asserts that the translation of tacit knowledge involves what will henceforth be referred to as *Sameing strategies*, which are revealed to be (post)colonial processes underlying the legitimization of medical systems.

The notion of an all-encompassing modernity is discussed by Blaser (2013) as a process related to "European expansion and its effects" (549) (namely, colonialism), which "engulfs cultural differences" (ibid., 548). This discussion considers methods of Othering and Sameing as polarized means to the same end: the homogenization of the dominant self and the dominated Other. While Othering perpetuates the self/Other divide and relies more on *coercion* to achieve homogenization, Sameing collapses the self/Other divide and relies primarily on *persuasion* to achieve homogenization. In the wake of this "collapse," Blaser (2013) asks the question, "whose self becomes naturalized?" (549). Although a collapse may feign neutrality, the hegemony of the Eurocentric and paradigmatically modern self remains in tact; its dominance is secured and induced through the authority of a "universal science" that claims to be able to ascertain the "Truth", as per its many demonstrated feats since its inception in the sixteenth century (Blaser, 2013, 555). This persuasion serves to subjugate the Other in the image of the dominant self; in this context, the subjugation of Sowa Rigpa in the image of an *ideology of science* (Craig 2012). Craig uses this term to illuminate that the validity of traditional medical systems is based on their explicability and subsequent alignment with biomedical standards; this is the overarching mode of engagement through which traditional Tibetan Medicine is legitimized and with which it must coincide.

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Rather than directly engaging with polarized notions of traditional and modern paradigms, citing the limitations of a bounded dualism, Craig (2012) instead engages with and adopts the metaphor of a mosaic to emphasize the complexity and fluidity of this medically pluralistic context (9). However, this negation posits a neutrality that leaves the power dynamics that permeate this context unexposed and therefore unchallenged. Meanwhile, the imposing nature of the power-laden self/Other divide is particularly evident in the absence of this division in the social ecologies underlying Sowa Rigpa, wherein humans, nonhumans, and environment are all connected through overlapping capacities of intentionality and agency (Craig 2012; Povinelli 1995; Watts 2013). Subsequently, incommensurability (again, understood as the tension between traditional and modern paradigms) occurs as the (post)colonial structures, which underly external regimes and are premised by a self/Other divide, endeavor to evaluate these Other systems based on their truthfulness; in this case, their efficacy. This results in two forms of subjugation. First, these systems are "disqualified" (Foucault 1994, 203) as beliefs "rather than a method of ascertaining truth" (Povinelli 1995, 506). Second, these systems are "insufficiently elaborated" (Foucault 1994, 203) and distilled as "provocative or interesting interfaces of accessing the real" (Watts 2013, 26). To this end, in their response to "qualify" and "sufficiently elaborate" Tibetan medicine, Sowa Rigpa proponents must engage with concomitant processes of translation and legitimization aimed at validating the Tibetan medical system according to the biomedical regulations, policies, and standards delineated by an ideology of science (as well as the regimes that it informs). Rather than challenging views of polarized portrayals of "traditional" and "modern" categories by rejecting the premise of such notions, it may be more useful to instead expound the nature of the incommensurability that is born of the structures and processes that facilitate such polarities. When expounded, it is revealed that translation relies on approaching incommensurability by engaging in Sameing strategies, which are in effect (post)colonial processes of assimilation and appropriation. This analysis therefore illuminates the power-laden reality of medically pluralistic contexts and more accurately depicts the challenges faced by non-biomedical medical systems.

(POST)COLONIAL PROCESSES; SAMEING STRATEGIES

The struggle of Sowa Rigpa proponents to revitalize and validate their medical system takes place within a (post)colonial paradox of coerced/persuaded consent (Blaser 2013, 555) that demands the demonstration of efficacy. This paradox can be understood by revealing that the translation of tacit to explicit knowledge mobilizes Sameing strategies of assimilation and appropriation. These strategies are employed as Sowa Rigpa is translated through *mimesis*, in the form of assimilative Good Manufacturing Practices (GMP), and through *essentialization*, in the form of appropriative pharmaceutical commodification. Consequently, Sowa Rigpa is translated and transformed into a system that is legitimized and that is more readily acquiescent to the imperatives of varying external regimes, such as the Chinese government and the pharmaceutical industry. It is therefore argued that reiterating an "all-encompassing modernity" as both the collapse of the Eurocentric self/Other divide and the subsequent imposition of the homogenous category of efficacy in this context reveals that the translation of tacit knowledge to explicit knowledge to legitimize Sowa Rigpa is predicated on Sameing strategies of assimilation and appropriation and is therefore a (post)colonial endeavor. In other words, the possibility that Sowa Rigpa, and

traditional or non-biomedical medical systems more broadly, are being (post)colonized must be more directly considered and investigated, particularly in the wake of globalism and the emergence of "integrative" medicine.

Mimesis: Assimilation through Good Manufacturing Processes (GMP)

Knowledge systems can be weaponized against other systems by imposing "regimes of truth" (Foucault 1980) in order to derail the power of these other systems' legitimacy. As per the nature of oppression, there are a limited number of ways in which those systems experiencing assault can respond. One response is to invoke *mimesis* as a method to derive (or regain) legitimacy by reflecting aesthetic components to garner the validation that is deemed necessary. Before continuing, it is incumbent here to note the contentions surrounding the concept of mimesis, particularly because its use here falls directly along the axis of these disputes. Debates are particularly fervent following Taussig's applications, which Huggan (1998) critiques, and are typically regarding the function underlying the nature of the "mimicking" or "imitation" that might occur in contexts involving dominant and dominated groups ([post]colonial contexts); namely, whether imitation of the former by the latter is strategically performative or meant to genuinely mediate between systems (Huggan 1998, 94). Fully divulging the details of this debate is beyond the scope of this review but put simply, it reflects a question of whether the resemblances that occur when dominating and dominated systems meet are more superficial and external or more genuine and internal; of course, there remains the issue of how "superficial" and "genuine" are to be defined. Concurring with Craig's (2012) views on such polarities, it is likely neither one nor the other exclusively; however, this still presents a complicated question, as the answer will reflect the extent to which the agency of the dominated system can be exercised. Consequently, this question echoes a much broader discussion concerning the balance between "dark anthropology" (which focuses on the more difficult aspects of social life) and an "anthropology of the good" (which focuses on the more optimistic dimensions of social life) (Ortner 2016, 47). And while it is not im- possible to hypothesize about such things—indeed, this is often a primary component of an anthropologist's role as a mediator— it must be noted that declaring intent or outlining agency incorrectly can lead to either paternalistic conclusions that overstate strife and reduce agency or dismissive conclusions that reduce strife and overstate agency. That being said, although underlying intent will vary with context, the process of "imitation" remains rather standard and will be the focus of this discussion.

To reiterate, these complexities do not necessarily prohibit the utility of the concept of mimesis, rather they invite an opportunity for critical engagement and demand that the concept be applied mindfully, which is the ideal standard for all concept use. So, keeping its history in mind, the explanatory power of mimesis to consider the phenomena derived in *Healing Elements* will be delineated as clearly as possible moving forward. Ideally its application here will either contribute critically or be the object of critique in ways that will contribute to future elaborations of the concept and its use in (post)colonial contexts.

To continue, mimesis refers to "the capacity of people to see or create resemblances between themselves and others or to identify uncannily with their object of representation" (Huggan 1998, 93). This process is instigated by the power of accusation wherein other modes, or Others' modes (Hall 1992), are subdued by the structures of the dominant self and then induced to participate in their own assimilation through mimesis. To this end, assimilation occurs in the context of Sowa

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Rigpa legitimization, potentially as a top-down process that risks progressing from an aesthetic camouflage to engaging in "deconstructive ventriloquism" (Hall 1992, 286), whereby the regurgitation of biomedical principles and practices meant to legitimize Sowa Rigpa run the risk of eroding and replacing those that define the traditional system.

Again, while it is outside the capacity this review—and this reviewer, as such conclusions must be directly informed by those more directly experiencing a context—to determine whether this method is more helpful or more harmful, it is certainly present and emerges in *Healing Elements* through the introduction of Good Manufacturing Processes (GMP). These are strict regulatory conditions regarding the evaluation and processing of *materia medica* (medicinal materials, specifically plants) as defined by the "regimes of pharmaceutical governance" (Craig 2012, 24). GMP are introduced to ratify accusations of insufficient standards. Subsequently, they are implemented as a criteria for medicines, resulting in the enforced mimesis of factory production facilities. This includes factories fabricating the "look" of GMP in terms of architecture, which results in "spaces of incommensurability" (Craig 2012, 59), meaning production regulations that contradict traditional methods. An example of this contradiction occurs in what Craig (2012) notes as the "fetishization of cleanliness" (163, 201), which recasts flowers, some of which are used to make Tibetan medicines, as a form of pollution and requires that they be removed from the vicinity of medicinal production facilities. In this sense, GMP enhances visibility of Tibetan Medicine "while draining its force" (Huggan 1998, 99). Further issues arise when these regulatory apparatuses themselves become symbols of legitimacy, and GMP-certification becomes necessary in "rendering Tibetan Medicine legible within the context of contemporary China" (Craig 2012, 158). Consequently, the legitimacy of Sowa Rigpa is qualified using mimesis to translate tacit knowledge through an operationalized assimilation to explicit knowledge. (As an aside, and for future consideration regarding the contention and complexity surrounding the concept of mimesis, perhaps the simplest way to approach this uncertainty is to first consider the question, "who is the operator?")

Essentialization: Appropriation through Commodification

Tibetan medicine, in the form of state-certified commodities, involves the commodification of a central element to Tibetan culture (Nigh 2002)—Sowa Rigpa materials. The process creates a product that is both "mystical and scientifically proven" (Craig 2012, 180); however, the latter paradoxically involves medicines being stripped of their paradigm of origin, followed by a romanticized version of this tacit knowledge then being fabricated as explicit. The commodification process therefore relies on the dissection of medicines; this operation includes the extraction of those parts that align with science and the rejection of those parts which do not. In this way, the elements that define Sowa Rigpa are either "derided as spurious or embraced as authentic" (Blaser 2013, 559), and done so according to the extent to which these elements "can be made to fit existing and interested preconceptions" (Ibid). Those aspects that are embraced refer to those which "allopathic medicine [and other regimes] can intellectually comprehend and commercialize" (Nigh 2002, 469). Next, the same colonial lens that performed the dissection is used to recall the context that it disassembled. Authenticity is then restored (though arguably, and ironically, manufactured) by a romanticized and "homogenizing gaze" (Nigh 2002, 452). Through this process, Tibetan culture is transformed and hypercontextualised into a

static display. Subsequently, anxiety emerges that "perhaps the display is insufficient to prove authenticity [, and] [t]he culture of display is granted the status of a standard against which other instantiations of authentic identity can be gauged" (Hankins 2012, 14). In other words, this describes the process through which stereotypes (Hall 1992) are created and sustained. The resulting product represents "a Tibet that is culturally intact, spiritually infused, politically docile, and scientifically potent" (Craig 2012, 179). Tibetan medicine is therefore translated in this context by effectively appropriating *tacit culture* through (post)colonial essentialization in the form of commodification.

DISCUSSION

Craig's (2012) discussion of colonialism includes noting that in the context of this work it is not isolated to reiterating Western ambitions, but also includes the pressures of Chinese regimes. This consideration can be extended by articulating that the tensions discussed in *Healing Elements* are provoked by and arise from a need for justification of Tibetan medicine, which is necessitated by a (post)colonial context. Throughout the ethnography, Craig comprehensively notes the efforts of *amchi* to "secure and revitalize their practice in the face of major socioeconomic, cultural, and political change" (Craig 2012, 18); however, challenging polarized notions of "traditional" and "modern" by refusing to engage with them directly leaves the fact that these changes are implicated within a (post)colonial context relatively uninvestigated. Moreover, this leads to the dangerous possibility that the contradictions and compromise that result from these efforts will be regarded as necessary sacrifices in the quest for external legitimization rather than as casualties incurred through the subjugation of this traditional medicine.

Moreover, in declining to explicitly engage with and contextualize this dichotomy thusly, incommensurability may be misunderstood as a result of the presumed fixedness of traditional paradigms. The consequences of this omitted context are that tensions marking the aforementioned resistance (for example, of language) and defiance (for example, of objects) (Craig 2012) might appear instead as a noncompliance or defiance of tradition with modernity and are then susceptible to being explained away as the ignorance or uncertainty of the "fixed" former (Smithson 2012). These are dangerous reductions. Alternatively, by acknowledging incommensurability as a (post)colonially-perpetuated process, it is possible to expose these paradigmatic tensions as the result of the rigid and incessantly inflexible (post)colonial structures undergirding an all-encompassing modernity (Blaser 2013). To this end, it is then possible to challenge the contrasting and reductive connotation of tradition that denotes stagnancy, and instead to reveal the flexible and dynamic nature of this paradigm (and the entities derived from it, such as non-biomedical medical systems). For instance, defiance and resistance in response to the impositions of a modern paradigm whose (post)colonial underpinnings are acknowledged subsequently recasts these responses as protests against (post)colonial processes (Hall 1992). This distinction, which exposes the ironically consistent structures underlying modernity and reveals the overlooked dynamism of tradition, is what is at stake in these elaborations.

CONCLUSION

By emphasizing the centrality of translation in this work without outlining the underlying (post)colonial structures upon which this translation is grounded, these translations are susceptible to being misrepresented solely as *negotiations* between traditional and modern paradigms rather than as *navigations* of the

power relations within which these maneuvers are implicated. This is an important distinction because the former denotes being subject to encounters with external regimes while the latter involves asserting agency though strategic engagement with these regimes. Craig's (2012) approach to erode this dichotomy by reiterating that *amchi* practitioners engage in developmental processes, such as empiricism, as a part of their practice is noteworthy; however, more directly acknowledging the structures underlying the translation of Tibetan Medicine enables the tensions that arise to be better understood beyond what might be presumed as a tired (though, never *re*tired) clash between traditional and modern paradigms. Consequently, rather than appearing as a traditional system's incompatibility with modernity, these tensions can then be contextualized as the result of the imposed homogenous category of efficacy, which leads to assimilation and appropriation—the Sameing strategies—indicative of (post)colonialism.

Blaser (2013) articulates an important quandary, asking a question of "how to overcome this Sameing that transmutes the inherent hybridity of cultures into ethnographically 'thin' differences unified under the banner of modernity (be they defined as the capitalist world system or otherwise?" (549). It is offered here that contextualizing that the translation of tacit knowledge to explicit knowledge takes place in a landscape terraformed by (post)colonial processes would allow for a more accurate depiction of the dynamism, adaptability, overarching inventiveness, and therefore value of traditional paradigms, such as that which informs Sowa Rigpa. Neglecting to outwardly acknowledge the (post)colonial frame that undergirds the paradigmatic clash between dichotomized notions of "traditional" or "modern" systems leaves this scaffolding unpronounced, unchallenged, intact, and therefore enabled. While this contextualization may not overcome the realities which it describes, at the very least, it offers a recourse that is far less complicit than otherwise ignoring, and subsequently enabling, the nature of these (post)colonial processes.

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